A Study of Shanghai and Hong Kong as International Financial Centres
- a review of their developments and attributable factors

by

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ABSTRACT

The development of an international financial centre has long been an interesting topic to economists, researchers and policy makers. Understanding the development process and the critical success factors helps much in formulating the suitable strategic development plan for the city and more efficient allocation of resources. Among the various international cities or financial centres, the development dynamics of Hong Kong and Shanghai are of high interest to many researchers not only due to the fast emerging growth of the Chinese economy and its influence on the world economy, but also due to the different economic development path of these two places. Using Hong Kong and Shanghai as examples, this paper reviewed and assessed how closely the link between academic literatures, such as Supply and Demand Theory (Smith 1776) , Location Theories (Thunen 1826, Weber 1969, Losch 1954) and Central Place Theory (Christaller 1966, Crocco, Calvante and Castro 2006), Urban Economic Growth Theory (Jacob 1975), Economies of scale (Rosenthal and Strange 2001), Self-reinforcing (or Cumulative Causation Theory) (Pagano et al 2002), Regulations and Prudential Supervision, and Resources based view (Barney 1991), etc., on this topic against the actual historical development of these two places. A survey was constructed to identify from perception of finance industry practitioners the most important key success factors that contribute to the development of these two places as international finance centres. The six most important factors identified are (1) Political Stability; (2) Infrastructure; (3) Regulation and Prudential Supervision; (4) Legal / accounting /

governance systems; (5) Market Openness; and (6) Labour supply & quality. Comparing the two places, the survey also revealed that Hong Kong, in general, was perceived to have better infrastructure, financial market regulations, quality of human resources, economic environment and political environment & government support than the Shanghai counterpart. Compared with Hong Kong, Shanghai was still lacking behind in the development stage of becoming an international finance centre, though it was catching up fast. Looking forward, for either or both Hong Kong and/or Shanghai to further strengthen their status as international financial centres, it will to a large extent hinge on how well the policy makers of these two places can further enhance these key success factors. The paper covered a discussion of the future prospects of Hong Kong and Shanghai and at the end of it, various directions of future research were recommended.

CONTENTS

Chapter 1: Introduction

1.1 Background

The development of an international financial centre has long been an interesting topic studied by researchers. Understanding the development process as well as the critical success factors enables policy makers to formulate the suitable strategic development plan for a city and allocate the resources of a country more efficiently. To achieve this, a good understanding of some relevant economic theories and being familiar with the historical development of an international financial centre will help determining what the key successful factors are for a city or a place to be developed into an international financial centre. From the perspective of an agglomeration economy and the viewpoint of a particular financial firm, the gains derived from being located in a financial centre can have various sources: economies of scales due to greater market size (within close range); economies of scope due to larger number of similar firms in the same regions sharing production and communication resources, lower infrastructure costs (spread over a greater number of users); lower information and transaction costs due to the greater range and facility of face-to-face contacts, more flexible and rapid input relationships, given the greater diversity (and proximity) of potential suppliers; lower training and recruitment costs due to the presence of a large and diversified labour pool which, in turn, has a direct impact on labour productivity.

The development of a city or even a more sophisticated financial centre is always attracting attention of economists. Among the various international cities / financial centres or emerging international cities / financial centres, the development dynamics of Hong Kong and Shanghai are of high interest to many researchers not only due to the fast emerging growth of Chinese economy and its influence on the world economy, but due to also the different economic development histories of these two places.

To trace back to the past, banking and finance were introduced from overseas into both Hong Kong and Shanghai at approximately around the same time after the end of the First Anglo-Chinese War (1839–42)[1], when the Chinese Government surrendered Hong Kong to Britain and declared Shanghai as one of the "treaty ports"[2]. The British-owned bank, The Oriental Banking Corporation[3], was the first bank to arrive and set up a banking branch in Hong

[1] Tthe First Anglo-Chinese War (1839–42) is known also popularly as the First Opium War. It was fought between the United Kingdom and the Qing Dynasty of China over importing and trading of opium in China.

[2] "Treaty ports" was the name given to the port cities in China that were opened to foreign trade by the treaties signed between the Chinese Government and various foreign governments.

[3] The Oriental Bank Corporation was a bank in India since 1842 and was also the first bank in Hong Kong and the first bank to issue banknotes in Hong Kong. The bank kept expanding fast and open branches opening in Chinese treaty ports, Hong Kong, Japan, India, Mauritius and South Africa. In the 1860s, the bank held a dominant position in India and China. However, due to severe financial difficulties in 1884 and growing competition, the bank finally closed down in 1892.

Kong in 1845 and an office in Shanghai in 1847. Due to the increasing need for banks to finance the growing trade (such as opium trades) between China and Europe, the Hong Kong and Shanghai Banking Corporation (now named HSBC Holdings) was established in Hong Kong in March 1865 and then one month later in Shanghai in April 1865. Later, more banks made an inroad into Hong Kong from other countries such as America, France, Netherlands, Japan, and Germany. Chinese banks also began to appear towards the end of the 19th century. The first modern Chinese bank, the Commercial Bank of China, was established in 1897 with its head office in Shanghai. The first stock exchange was formed in Hong Kong in 1891 and in Shanghai in 1904. Insurance companies also began to appear in both cities from the middle of the 19th century onwards. Interestingly, since then, the development of Hong Kong and Shanghai varied substantially in the 20th century. While Shanghai had a long history with its good reputation of being the busiest, most open, and most developed business and financial centre in China before World War II, it has lost momentum after mid-nineteenth century. Hong Kong has grown fast to replace Shanghai as being the entrepot between China and foreign countries. Hong Kong emerged onto the international scene after World War II as one of the world's greatest economic miracles and freest economy. In some ways, the rise of Hong Kong could be partly a consequence of Shanghai's decline after China embarked on a course of socialist experimentation. The historical economic development of Hong Kong and Shanghai will be discussed in greater detail in Chapter 2.

1.2 Dynamic between Hong Kong and Shanghai

While China is keen to restore Shanghai's former status as an international financial centre, there is no doubt that at present, Hong Kong still has various distinct advantages over Shanghai. Not only has Hong Kong retained its separate easily convertible currency and financial system which is well-linked to the international market, but Hong Kong's regulatory and tax regime are still more liberal than its China counterpart. Moreover, unlike China, Hong Kong gives the same treatment to both national and foreign companies and investors and Hong Kong also plays the role as a de facto financial entrepot within the Greater China region.

At present, Hong Kong is still a more important international financial centre than Shanghai on the worldwide stage based on more foreign companies listed in Hong Kong, more international financial institutions based in Hong Kong and have their regional headquarters set up in Hong Kong. Shanghai is a rapidly growing rival to Hong Kong in light of Hong Kong's sluggish economic condition in comparison to Shanghai's (as well as the entire China's) recent fast economic growth. According to official economic statistics published by the two governments, in 2005, Hong Kong's GDP was about 1.6 times that of Shanghai and its per capita GDP was even more than 4 times than the counterpart. Yet, following the financial crisis in 2008, the GDP of Shanghai had already overtaken Hong Kong the first time in 2009 with RMB1.49 trillion (US$218.26 billion) compared to Hong Kong's HK$ 1.61

trillion (US$207.39 billion) in the year, in spite of there was still a big gap in the GDP per capita between Shanghai and Hong Kong. In 2010, Shanghai posted a GDP per capita of US$10,828 while the GDP per capita of Hong Kong in 2010 was still almost 3 times that of Shanghai, reported at US$31,799.

While the economy of Shanghai is growing fast, it is also increasingly seen as a rival to Hong Kong. Competition between the two is expected to grow as the mainland China market continues opening up further. Considering it has already been over 14 years since the handover of sovereignty of Hong Kong from Britain to China in 1997, comparison of the economic development of Hong Kong and Shanghai has attracted increasing attention and discussion.

1.3 Objective of the study

While there have been researchers long looking into and developing various development economic theories (Chapter 3), there have been limited attention paid on bridging the gap between theories, reality, as well as perceptions of industry practitioners. The understanding of key success factors contributing to the development of financial centres is important for policy makers to formulate appropriate strategies to strengthen or further enhance the role of either Hong Kong or Shanghai or both as international financial centres. It is anticipated that this research will help put together previous knowledge in relation to the development of international financial centres from the three aspects: (1) relevant economic theories from academic literatures; (2) historical development of Shanghai and Hong Kong, and (3) perception from industry practitioners.

To achieve this, it is the objective of this research to review not only the various relevant economics and finance theories but also to look into the historical development of Shanghai and Hong Kong to understand what factors are attributable to the development of these two places. After that, a survey is conducted to explore and extract the perception of finance professionals about this so as to bridge the gap between theoretical predictions and practical ideas from industry practitioners. The research will:

1. Review and briefly summarise the historical development of Shanghai and Hong Kong as international financial centres.

2. Review major economic theories in relation to the development of a city and possible emergence as an international financial centre.

3. Construct a survey to identify possible factors contributing to the development of Shanghai and Hong Kong as financial centres based on the perception of the finance practitioners.

4. Discuss the future prospects of Hong Kong and Shanghai

1.4 Structure of the thesis

To address the abovementioned research objectives and to facilitate the discussion, this paper is divided into the following chapters:

Chapter 1: Introduction

Chapter 2: Historical Economic Development of Hong Kong and Shanghai

Chapter 3: Theories on the Development of an International Financial Centre: - A Literature Review

Chapter 4: Research Methodology

Chapter 5: Survey Findings

Chapter 6: Theory versus Reality and Future Prospects

Chapter 7: Conclusions

Chapter 2: The Economic Development of Hong Kong and Shanghai

What is an international financial centre? According to Robert (1994), a financial centre can be described as a place where there is high concentration of financial intermediaries (such as banks, securities trading companies, insurance companies, etc.), and in which a comprehensive set of financial markets are allowed to exist and develop, so that financial activities and transactions can be effectuated more effectively and efficiently. Based on this general description of financial centre by Robert (1994), we shall extend to define an international financial centre as financial centre where the financial activities are international in nature. Please refer to Chapter 3 for a more detailed elaboration on definition and classification of international financial centres by various researchers.

This chapter would discuss and review the historical economic development of Hong Kong and Shanghai. A review of the historical economic development of these two places would help us acquire more insights regarding the key success factors and attributes of Hong Kong and Shanghai emerging as international financial centres.

2.1 Historical Economic Development of Hong Kong

2.1.1 An Overview

Having a colonial historical background and a tight link with China, Hong Kong

is a place where east meets west. Thanks to a dramatic and rapid post-Second World War economic transformation which turned Hong Kong from a regional entrepot into a highly commercialized and industrialized centre in the world, Hong Kong has now become one of the world's major industrial and financial centres. Cheap labour in the early colonial period, high profits, laissez faire government and substantial re-investment all contributed to Hong Kong's economic development. Hong Kong government followed a laissez faire approach and relied heavily on the private sector to invest in the economy's capital formation and also to channel funds to investment activities. The remarkable economic development of the financial sector of Hong Kong is attributable to the strategy of providing an open and competitive economic environment with high political stability.

During the decade before 1982, despite economic fluctuations in many regions around the world, according to statistics from Hong Kong Government, Hong Kong was able to maintain an average GDP annual growth of over 15%. From 1966 to 2010, GDP increased tremendously from some US$1.82 billion to over US$225 billion. As shown in Table 2.1 which is extracted from the website of the International Monetary Fund, the per capita GDP of Hong Kong in 2010 was around US$31,591, which ranked 25th in the world:

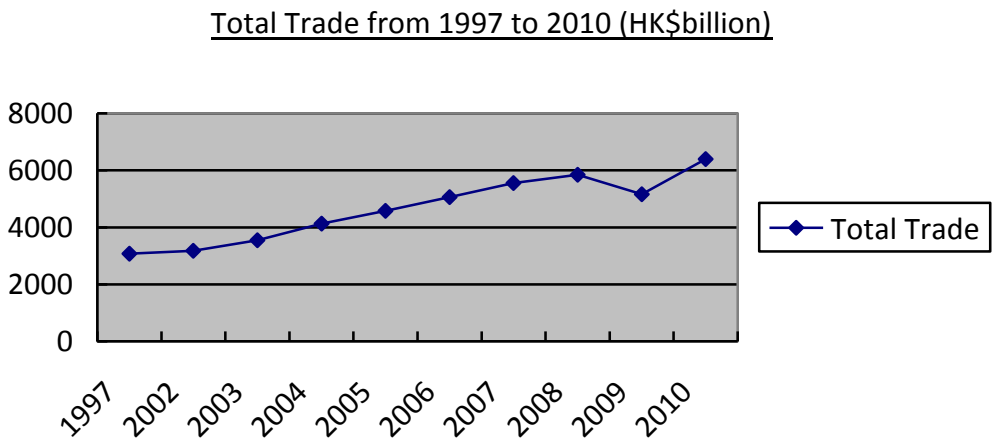
Table 2.1 Global GDP per capita 2010

Rank	Country	US$
1	Luxembourg	108,832
2	Norway	84,444
3	Qatar	76,168
4	Switzerland	67,246
5	United Arab Emirates	59,717
6	Denmark	56,147
7	Australia	55,590
8	Sweden	48,875
9	United States	47,284
10	Netherlands	47,172
11	Canada	46,215
12	Ireland	45,689
13	Austria	44,987
14	Finland	44,489
15	Singapore	43,117
16	Japan	42,820
17	Belgium	42,630
18	France	41,019
19	Germany	40,631
20	Iceland	39,026
21	Kuwait	36,412
22	United Kingdom	36,120
23	Italy	34,059
24	New Zealand	32,145
25	*Hong Kong*	31,591

Source: International Monetary Fund website

Hong Kong is also one of the leading international trading and services centre and also recognised as one of the freest economies in the world, and a strategic gateway to the vast Mainland market. Hong Kong's success owes much to a simple tax structure and low tax rates, a versatile and industrious workforce, excellent infrastructure, free flow of capital and information, the rule of law, and the Government's firm commitment to free trade. While some might have speculated that external trade of Hong Kong may drop after 1997 when it was handed over from British to China and the role of being the entreport may reduce, it was not true as the total external trade increased from HK$3,071 billion in 1997 to HK$6,396 billion in 2010 as plotted in Graph 2.1 based on the official data collected from the Hong Kong Government. According to the Hong Kong Factsheet 2010, Hong Kong was the world's 10th largest trading entity in terms of value of merchandise trade in the year.

Graph 2.1 Hong Kong Trade : 1997 - 2010



Source: Hong Kong Annual Digest of Statistics 2011

2.1.2 Economic Development History of Hong Kong

Assembling and summarising the previous research work regarding the history of Hong Kong by Liu, Wang & Chang (1997), Carroll (2007), and Lui (1990), major historical events and developments that had substantial impact on the economic development of Hong Kong were highlighted in the following sessions.

2.1.2.1 Period before Hong Kong became an Entrepot Port (1840-1860)

Hong Kong was surrendered by China to the United Kingdom under the Treaty of Nanjing amid the Opium War and was then declared a free port by the British government. Since then, numerous goods and capital from all over the world were transported to Hong Kong. Its deep natural harbour and the construction of warehouses and port facilities contributed much to Hong Kong for its development to be an entrepot. In addition, Hong Kong has been used in the early days of British governing in Hong Kong, as one of the largest base for opium smuggling centres in the Far East, which plays an important role to boosted the economic activities in Hong Kong during the early days.

2.1.2.2 Period being an Entrepot Port (1860 – 1950s)

There were some industrial enterprises even in the early days of the British occupation of Hong Kong, mainly shipyards for building and repairing ships in the interest of transit trade. Light industry began to emerge in the late 19th and early 20th centuries. Following the outbreak of the War of Resistance against Japan in 1937 Japanese troops gradually occupied many of China's industrial and commercial cities. Consequently, many Chinese enterprises moved to Hong Kong, bringing with them large amounts of capital and technology, which boosted the rapid growth of Hong Kong's industry. The Japanese occupation of Hong Kong during the Second World War has brought big changes to the Hong Kong's economy. Hong Kong was occupied by Japanese forces from December 1941 to August 1945, and during that period, all banks and other financial institutions owned by nationals of the Allies and the Chinese Government were closed, so were financial markets. Only a few local ethnic Chinese banks were allowed to operate, subject to severe limitations. When the Japanese occupation of HK ended on August 30, 1945, the economy of HK was in ruins. Even the long established trading houses had difficulty in renewing business quickly. With the influx of refugees and entrepreneurs, beginning in 1949, the need to expand the economic activities of HK became even more urgent. However, until then, the local banks were inexperienced in industrial credit and lending since most of them, especially the large British financial institutions, were mainly concerned with mercantile affairs and had little or no interest in industrial lending. By 1946, the number of factories had dropped substantially.

After Japan surrendered, Hong Kong was able to enjoy a prolonged period of relative peace and stability. After the Second World War, the local Hong Kong economy picked up and recovered rapidly on strong demand of low-end products (such as textile, electronics) where Hong Kong has a comparative advantage of low labour costs.

The Chinese Civil war in 1948 and 1949 and the subsequent Communist occupation of Mainland China has facilitated the rapid post-war growth of Hong Kong. Nevertheless, the impact is a two-edged sword. On the negative side, it led to a re-orientation of China's trade towards the USSR and Eastern Europe and not to go through Hong Kong which had affected initially the entrepot business of Hong Kong causing Hong Kong's re-exports and exports trade with China dropped drastically in the 1950s. On the positive side, it had led to a massive inflow of refugees comprised of capitalists, professionals, skilled and unskilled workers from the Guangdong Province, Shanghai and other commercial centres of China, estimated to be about one million during the period 1948 to 1951. Between the period from 1952 to 1958, the population of Hong Kong increased at about 5% per annum and Hong Kong, being an entrepot at that time, could not create vast job vacancies to absorb such a large number of refugees within a short period of time. Hence, unemployment was very high and was estimated to be between 15 to 17% in mid 1950s. Nevertheless, it contributed to a low labour cost environment in Hong Kong, which facilitated more prolonged economic development in the future.

Among the refugees were large groups of experienced Shanghai entrepreneurs, most of them were in the textiles manufacturing industries. They brought along with them capital, skilled workers, technology know-how and machinery and other equipment from the west. Because there already existed in Hong Kong excellent infrastructure in transportation and communication, good connections with major industrial countries, it was natural and logical for these capitalists to set up factories in Hong Kong.

In 1951, the Korean War broke out. North Korea was supported by the Chinese Communist Government. The United Nation put an embargo on mainland China, an important partner of Hong Kong's external trade. Thus, the territory's economy was adversely affected. The British government, submitting to US pressure, carried out an embargo against China, dealing a heavy blow to Hong Kong's transit trade. There was stock piling of materials in China, and Hong Kong enjoyed a moment of frantic import-export trade activity. However, conflict between the United Nations forces and the North Koreans soon involved the Chinese, and the United Nations imposed an embargo on strategic materials to China on May 18, 1951. This effectively has caused negative impact to entrepot trade with China as the foundation of Hong Kong's economy. A drastically reduced entrepot trade and the already swollen surplus labour market created an increased urgency for establishing new directions for the Hong Kong economy. Such dramatic changes forced the people of Hong Kong to a new way – light industry. After the wars, great numbers of mainlanders rushed to Hong Kong and brought with them huge amounts of capital and technology for the development of light industry.

Yet, on the other side, during the Indochina conflict, Hong Kong stood to benefit in unexpected ways. Because Hong Kong was not one of the immediately endangered areas, it became one of the few relatively stable and safe places within Southeast Asia for capital investment under the control of overseas Chinese. Banks in Hong Kong soon received inflowing deposits of capital. This inflow of capital from Southeast Asia was not, however, immediately beneficial to the development of local industries. Most of the banks were reluctant to back untried ventures, and they were more willing to finance real estate developments than industrial enterprises.

As mentioned above, although both the China's civil war and the Korean War also indirectly affected Hong Kong, the adverse effect was far less than that suffered by Shanghai. In addition, Hong Kong did not experience any domestic political or social upheavals similar to the Great Leap Forward and the Cultural Revolution, except for a brief period in 1967 when the Cultural Revolution spilled over in the form of violent disturbances organized by local extreme leftists. Nor had Hong Kong undergone any extended period of "financial repression" as Shanghai had. Indeed, the Hong Kong authorities were renowned for their *laissez-faire* policies. Furthermore, Hong Kong, unlike Shanghai, did not have to bear an onerous burden by sharing its fiscal revenue with the Central Government. Although under the Defence Costs Agreements with Britain, Hong Kong had to bear the foreign exchange costs of the British Garrison, the amount involved was small (It accounted to only HK$344 million in the fiscal year 1997-98, or 0.15% of total revenue).

2.1.2.3 Post Second World War period to handover of sovereignty (1950s to 1997)

The Post Second World War economic development of Hong Kong began from the transformation of entrepot to a manufacturing centre (stage 1) in the period from 1950s to early 1960s, and then rapid industrialization (stage 2) in the period from 1960s to mid 1970s and then diversification and the rapid growth of service industries (stage 3) from mid 1970s onwards.

Following the founding of the People's Republic of China on Oct 1, 1949 Britain took the lead among the Western powers in extending recognition to China, out of its own interests in China and Hong Kong. Hong Kong could continue its large scale commercial and trade activities with China's inland provinces. According to official statistics released by the Hong Kong government, between 1950 and 1985, real growth rate of GDP averaged 9.9% per annum whilst that of per capita GDP between 1962 to 1985 was 6.0%. Per capita GDP rose from US$ 180 in 1948 to US$ 6134 in 1985, more than sevenfold increase in real terms. Full employment was attained at the turn of the 1960 decade with natural unemployment rate of just 1.7%. It was during the 50's and 60's that Hong Kong completed, step by step, its transition from the period of being an entrepot port to the period of industrialization. During the period, the industrialization of Hong Kong was evidenced with rapid growth in domestic production.

During the post Second World War period, the Western industrial powers dropped the high cost labour intensive mode and turned into capital intensive and technology intensive modes. This created a good opportunity for Hong Kong to develop its export oriented light industry as there were lots of cheap workers.

In the 1960s, China's introduction of the reforming policies and opening its economy up had led to substantial economic upsurge in Hong Kong. Since then, Hong Kong has been named one of the Four Little dragons in Asia, with rapid economic growth.

Hong Kong was facing intensifying competition from neighbouring countries in the 1970's. Competitors such as Taiwan, Singapore and South Korea, etc. had highly developed their industries, boosting their export. Furthermore, the emergence of protectionism in various industrial nations in Europe and America gave rise to import quotas for clothing. In addition, the oil crisis in 1973 had hard hit the stock markets of Hong Kong. To cope with these, Hong Kong has carried out 3 diversification plans: (1) industry diversification, (2) economic structure diversification, and (3) market diversification. On one side, instead of relying too heavily on the four-pillar production industries for watches, garments, toys, and electronics, the government of Hong Kong has determined that it was crucial to diversity production into other industries such as plastic, paper, etc. On the other hand, the government of Hong Kong had also planned to diversify its source of national income from manufacturing to service-based industry such as financial, banking, tourism, etc. Furthermore, market outlet

has expanded to not only Asian countries and United States but to also European countries and other developing countries such as East European countries, Latin America, etc. Such diversification has led to many sectors such as finance, trade and real estate developed rapidly to broaden the territory's economic structure.

The "economic take off" began in Hong Kong in the mid-1970s, achieving Hong Kong's modernization and diversification of industries by producing goods of high value in the face of trade protection measures instituted by Europe and America. The number of registered enterprises rose from 16,507 in 1970 to 45,025 in 1980, with the number of employees rising from 549,000 to 907,000 registering increases of 2.7 times and 70%, respectively. After China introduced policies of reform and opening up a considerable number of Hong Kong's manufacturing enterprises moved north to Pearl River Delta, with the number of people they employed, with more than double that in HK, the low production costs further boosted the competitiveness of Hong Kong's industries. Vigorous development was witnessed in the tertiary industry, external trade, finance, building industry and tourism. Both government and the business sector have again made substantial contributions. For example, the establishment of the Trade Development Council by the Hong Kong Government has helped promote the products of HK to nearly all parts of the world.

The 1980s saw the economic downturn for many economies. The implementation of protectionism had made it very difficult for Hong Kong to export its local products. In addition, the prospect of Hong Kong was unclear,

which weakened the confidence of the world investors, until the Sino-British Joint declaration was announced in 1984. The 1997 issue has caused great disruptions to the economic development of Hong Kong. There was a general fear that if Hong Kong were to be run under communism and it may risk losing its status as an international financial centre. It was only until 26 September 1984 when the Sino British Agreement on Hong Kong's future was initiated in Peking and confirmed no change to the Hong Kong economic system for the next 50 years was signed, Hong Kong's status as an international financial centre has been re-established. The economy of Hong Kong was prosperous in 1997 with real estate price, stock market surged to historical peak level.

2.1.2.4 Post 1997 period

The outbreak of the Asian financial crisis following the burst of the economic bubble had reversed the economic growth of Hong Kong. Massive short selling of stock futures contract and Hong Kong dollars by international speculative hedge funds posted a huge threat to the long-lived link exchange rate system since 1982. To protect against possible devaluation of Hong Kong dollar, the Hong Kong Monetary Authority had implemented various measures to strength the currency board system so as to protect the linked exchange rate and to rebuild investors' confidence in Hong Kong financial market. Nevertheless, the overnight interbank borrowing rate surged to over 300% and the stock market plunged within a few weeks from 12,000 pts level to 6,900 pts during the year. The already sluggish Hong Kong economy was further dampened by the outbreak of SARS virus in 2003. Unemployment rate rose to

almost 8%, which was a 20-year high. Negative economic growth and negative net export were recorded. Statistics released by the Hong Kong government showed that, due to the Severe Acute Respiratory Syndrome (SARS) epidemic, the volume of Hong Kong airport single-day travels dropped by nearly 70% compared with the same period of the previous year, and nearly 30% of the scheduled flights were cancelled. The number of tourists to Hong Kong dropped by more than 70%. Industries extensively affected by the epidemic (food, travel, retail) estimated damages amounting to nearly HK$30 billion within one month. Employees in these industries lost their jobs as businesses closed down, resulting in rising unemployment rate and worrying social problems. Nevertheless, Hong Kong experienced a V-shaped economic recovery in 2004 on the back of the announcement and implementation of various policies under the Closer Economic Partnership Agreement ("CEPA") arrangement with Mainland China.

From 2005 – 2007, the financial sector of Hong Kong was boosted largely by the gradually opening of the China financial markets. The news that China government will be permitting outflow of investment funds from the Mainland China to Hong Kong helped boosted the Hang Seng Index by more than double to over 33,000 pts. A number of large China enterprises (e.g. China Mobile, China Construction Bank, Industrial Commercial Bank of China) has listed and issued its shares (i.e. Initial Public Offerings) in Hong Kong.

The outbreak of financial crisis originated in United States in 2008, triggered by the collapse of Lehman Brothers and Bear Stearns, restructuring of the investment banking industry, and various financial institutions were bailed out

by the US Government, has rised additional challenge to the economy of Hong Kong which is predominately export-oriented. External Trade reduced by 11.8% to HK$5,161.4 billion, in 2009, compared with 2008.

Nevertheless, as the economic activities stabilized since Q2, 2009 following the implementation of various stimulating monetary policy by various governments and the situation has been bottomed. In 2010, Hong Kong's external trade exhibited a strong rebound from the global financial turmoil of 2008-09. Total merchandise trade increased by 23.9 per cent to HK$6,395.9 billion in 2010 compared with 2009. Domestic exports rose by 20.4% to HK$69.5 billion while re-exports increased by 22.8% to HK$2,961.5 billion compared with the previous year. Imports increased by 25% to $3,364.8 billion. According to Hong Kong Yearbook 2010, Hong Kong's biggest trading partner in 2010 was the Mainland, followed by the United States (US) and Japan. In 2010, Hong Kong was the world's 10th largest trading entity in terms of value of merchandise trade. Looking forward, the economy development and growth of Hong Kong will continue to be closely linked with that of Mainland China in light of the closer economic integration.

2.1.3 Path to Become an International Financial Centre - Hong Kong

Since the early 1970s, Hong Kong has been developing into a global-scale financial centre. There has been a large number of international banks, representative offices, merchant banks, finance companies and other financial intermediaries, but also by the growing international orientation of her banking

operations and financial activities.

In the early 70's, a large number of foreign banks began interested to set up branches in Hong Kong, being attracted by its good business prospects and the facilities that she could offer to their offshore banking business. There was a stable political environment, and the least intervention from the government. Profit tax was the lowest in the region. There was no exchange control. The communication facilities were excellent.

Although the Hong Kong colonial government adopted a *laissez-faire* (or passive) attitude towards the development of Hong Kong's financial sector and it also did not pursue active policies to boost its international financial centre status, it did have implemented two policies which had significant impact on the finance sector of Hong Kong. In 1966, after a banking crisis rocked the whole financial system, the Hong Kong Government took the view that the territory was over-banked, and imposed a moratorium on new licences to foreign banks. This was, of course, a serious setback to Hong Kong's development as an IFC. Fortunately, it was not fatal, for foreign banks which wished to enter the market could still do so through one of the following channels: acquisition of equity interests in existing local banks, up to 100%, or to set up wholly or partly owned deposit-taking companies. Then, in the late sixties, several multinational American banks intended to set up an Asian-dollar market, which was basically an extension of the Euro-dollar market to a different time zone, in Hong Kong. The major stumbling block to this proposal was the Hong Kong Government's refusal to abolish the interest withholding tax on foreign currency deposits. Singapore, on the other hand, was only too glad to accommodate the US banks

by tax breaks and other incentives. As a result, the status and prestige associated with the hosting of the Asian-dollar market went to Singapore. Fortunately, as the Singapore's economy was too small to utilize all the US dollars deposited, this setback to Hong Kong, although serious, was not fatal. In effect, multinational banks tapped the Singapore market, and on-lent them to larger economies in the region, including Hong Kong. Because there were already a number of internationally active banks in Hong Kong, the territory naturally became a syndication centre, despite the moratorium. Moreover, thanks to its favourable business climate and tax regime, it also became a fund management centre for the whole region.

By the mid-1970s, many multinational banks had become increasingly frustrated by their inability to open full-service branches in Hong Kong. Confronted with growing pressure from such banks, and with intense competition from Singapore, the Hong Kong Government announced in March 1978 that it was ready to issue new bank licences again provided that the following requirements were met. First, the applicant banks must be incorporated in jurisdictions where there was effective prudential supervision. Second, they must have assets, net of contra items, exceeding US$3 billion (subsequently raised to US$16 billion in several steps). Third, some form of reciprocity was available to Hong Kong banks in the jurisdiction concerned. The effect of this measure was dramatic: before 1978, there were 40 foreign-incorporated banks in Hong Kong, but by the end of 1995, the number had increased to 154. Other liberalization measures soon followed.

The speed of development has been accelerated by the open policy of China adopted since the late 70's. The four modernization schemes of China

necessitate the purchase the capital goods from the west. The Chinese have increased their exports. Hong Kong has been a gateway between China and the west. The increase in trade has led to the increase in the need for financial services. So the banking sector experienced a rapid expansion. Meanwhile, Hong Kong has become the sources of finance for China's modernization schemes as large amounts of loans have been arranged in Hong Kong.

In February 1982, the interest withholding tax on foreign currency deposits was abolished. In 1989, all forms of tax on interest, including those paid by non-financial firms to depositors/lenders, were abolished. At the same time, the lending and borrowing of share scripts for settlement purposes was also exempted from stamp duty. By 1995 there were 185 licensed banks with 1,649 branches, of which 85 banks were among the top 100 in the world. There was a popular saying that there were more banks than rice stores in Hong Kong. There was also a fully developed foreign exchange market with brisk exchange business between Hong Kong dollars and other major currencies. Hong Kong's foreign exchange market was the 5th largest place in the world, after Britain, US, Japan, and Singapore. In 1986, the former four stock exchanges were amalgamated into the Hong Kong Association Stock Exchange which was also accepted as a full member of the International Stock Exchange Union in Paris. Hong Kong's stock market ranked 8th in the world and second in Asia at that time, next only to that of Japan. Hong Kong has been serving as a base of bloc credit or investment in Asia by various financial groups and is an important international financial centre like NY, London and Tokyo.

On the banking front, Hong Kong maintains a three-tier system of deposit-taking institutions, namely, licensed banks, restricted licence banks and deposit-taking companies. They are collectively known as authorized institutions (AIs) under the Banking Ordinance. AIs may operate in Hong Kong as either locally incorporated companies or branches of foreign banks. Only licensed banks may operate current accounts, and accept deposits of any size and maturity. Restricted licence banks are principally engaged in merchant banking and capital market activities. They may take deposits of any maturity of HK$500,000 and above. Deposit-taking companies are mostly owned by or, otherwise associated with, licensed banks and engage in a range of activities, in particular consumer finance. These companies are restricted to taking deposits of HK$100,000 or above with an original term to maturity of at least three months. Depositors in Hong Kong are protected by the Deposit Protection Scheme. Under the scheme, each depositor is entitled to compensation up to a maximum of HK$100,000 in the event of a bank failure. The three-tier structure enables soundly based institutions which do not qualify for a full banking licence to apply for a restricted banking licence or a deposit-taking company registration so as to enter the local deposit-taking market or to conduct wholesale and investment banking business. The authorisation criteria for licensed banks, restricted licence banks and deposit-taking companies seek to ensure that only fit and proper institutions are entrusted with public deposits. The licensing criteria are subject to periodic reviews to ensure that they reflect the changing needs of the regulatory environment and are consistent with evolving international standards. AIs have to comply with the provisions of the Banking Ordinance which, inter alia, require them to maintain adequate liquidity and capital adequacy ratios; to submit periodic statistical returns to the HKMA; to adhere to limitations on

loans to any one customer or to directors and employees; and to seek the HKMA's approval for the appointment of directors, chief executives (including their alternatives) and for changes in control. Overseas banks which operate in branch form are not required to hold capital in Hong Kong. They are also not subject to capital ratio requirements or to capital-based limits in large exposures under the Banking Ordinance. The legal framework for banking supervision in Hong Kong is in line with international standards including the Basel Committee's Core Principles for Effective Banking Supervision published in September 1997. The supervisory process follows a risk-based approach which puts emphasis on the evaluation of the quality of AIs internal risk management systems in respect of current and emerging risks they face. The objective is to devise a prudential supervisory system to help preserve the general stability and effective operation of the banking system, but which at the same time provides sufficient flexibility for AIs to take commercial decisions.

To more recent dates, according to the Factbook published by the Hong Kong Government, in the banking sector, at the end of June 2009, there were 144 licensed banks, 26 restricted licence banks and 28 deposit-taking companies in Hong Kong, together with 74 local representative offices of overseas banking institutions. These institutions come from 38 countries and include 68 out of the world's largest 100 banks. Together they operated a comprehensive network of about 1,370 local branches. Banks in Hong Kong offer a comprehensive range of retail and wholesale banking business such as deposit-taking, trade financing, corporate finance, treasury activities, precious metal trading, securities broking, etc. Hong Kong has been ranked first in terms of economic freedom for 13 years (1995 – 2007), according to the Heritage Foundation. The external net

assets held by banks and deposit-taking institutions reached HK$2,299 billion as of the end of August 2007, making Hong Kong now one of the largest banking centres in the world.

On the securities trading front, it is the Hong Kong Government's policy towards the securities industry to provide a favourable environment in the industry and a level playing field for market participants, with adequate regulation to ensure as far as possible, sound business standards and confidence in the institutional framework, but without unnecessary impediments of a bureaucratic or fiscal nature. The advances in technology and globalisation of the financial markets have also intensified the competition between the markets. To strengthen the competitiveness of Hong Kong as an international financial centre, the Financial Secretary announced in his Budget Speech in March 1999 a three-pronged reform for the securities and futures market. The reform includes enhancing the infrastructure for the market; modernising the market structure through the demutualisation and merger of the two exchanges and their three associated clearing houses, and modernising and rationalising the legal framework for the regulatory regime. For the market structure reform, the merger of the two exchanges and three clearing houses was completed on March 6, 2000 following the enactment of the Exchanges and Clearing Houses (Merger) Ordinance, on February 24, 2000. Hong Kong Exchange and Clearing Co Ltd (HKEx) as the merged entity became a listed company on its own stock market on June 27, 2000. The merger seeks to create a new market structure to achieve higher efficiency, cost reduction, better risk management and to facilitate development of new products and services, thereby improving the competitiveness of the market. While the HKEx is a commercial entity, it is

vested with the important public functions of maintaining a fair and orderly market and managing its risks prudently. Checks and balances are in place under the law to ensure that it would balance its public and commercial objectives in developing its business. As regards regulatory reform, the Securities and Futures Ordinance commenced operation on April 1, 2003. The Ordinance consolidated and modernised 10 existing ordinances into a composite piece of legislation governing the securities and futures markets to keep the regulatory regime on a par with international standards and practices. The opportunity was also taken to add new regulatory elements which include introduction of a single licence for market intermediaries to streamline regulatory arrangements and reduce compliance burden; introduction of new licensing requirements to enhance the quality of intermediary services; establishment of a civil Market Misconduct Tribunal and expansion of the existing criminal route to combat market misconduct; modernising the regime for disclosure of securities interests to enhance market transparency; and instituting a flexible framework for the regulation of automated trading services to facilitate market innovation. The Ordinance provides a more transparent and coherent regulatory regime and strikes a reasonable balance between protecting investors and promoting market development. It has enhanced Hong Kong's position as a major international financial centre and the premier capital formation centre for the Mainland of China. Hong Kong's stock market was the seventh largest in the world and the third largest in Asia in terms of market capitalisation as at the end of June 2009. In terms of total equity funds raised in the first half of 2009, Hong Kong ranked third in the world and first in Asia. A wide variety of products are traded in the stock market, they are ordinary shares, options, warrants, Callable Bull Bear Contracts (CBBCs), Exchange Traded Funds (ETFs), Real Estate Investment

Trusts (REITs), units trusts, debt securities, etc. According to HKEx, as at the end of June 2009, 1,273 companies were listed in the Stock Exchange of Hong Kong (SEHK), with a market capitalisation of HK$14,148 billion.

Hong Kong also has a mature and active foreign exchange market, the development of which has been stimulated by the absence of exchange controls in Hong Kong and its favourable time zone location. Links with overseas centres enable foreign exchange dealing to continue 24 hours a day around the world. According to a survey conducted by the Bank for International Settlements in 2007, Hong Kong was the world's sixth largest foreign exchange market in terms of turnover.

The Hong Kong money market consists primarily of the interbank market. The money market is mostly utilised by institutions at the wholesale level. The Hong Kong Interbank Offer Rate (HIBOR) is determined by the supply of and demands for funds between market players, and therefore is one of the most important indicators of the price of short-term funds in Hong Kong. The daily turnover in the Hong Kong interbank market averaged HK$210.3 billion in 2010. The Clearing and Settlement Systems Ordinance (CSSO) helps promote the general safety and efficiency of clearing and settlement systems that are material to the monetary or financial stability of Hong Kong or to the functioning of Hong Kong as an international financial centre. Under the CSSO, the Monetary Authority (MA) is empowered to designate and oversee such clearing and settlement systems. The Ordinance also provides statutory backing to the finality of settlement for transactions made through systems designated under the Ordinance by protecting the settlement finality from insolvency laws or any

other laws. The Monetary Authority issues certificates of finality to designated systems meeting certain criteria specified in the Ordinance. The CMU and Hong Kong dollar Clearing House Automated Transfer System (CHATS), Continuous Linked Settlement (CLS) System, US dollar CHATS and Euro CHATS, have been designated and each was issued a certificate of finality.

For the derivatives market, as at the end of June 2009, five types of futures product and two types of options product were traded on the Hong Kong Futures Exchange (HKFE) or the SEHK, including index futures, stock futures, interest rate futures, bond futures, gold futures, index options and stock options. Apart from the stock market and the futures market, there is also an active over-the-counter market which is mainly operated and used by professional institutions and trades swaps, forwards and options in relation to equities, interest rates and currencies. Hong Kong's debt market has developed into one of the most liquid markets in the region. The Central Money Markets Unit (CMU) Service, established in 1990, is operated by the HKMA to provide a clearing and custodian system for Exchange Fund Bills and Notes (EFBNs) and other private debt securities. The EFBNs had an outstanding amount of about HK$288 billion at the end of June 2009, when daily turnover in these papers averaged HK$144 billion. For Hong Kong dollar debt securities other than the EFBNs, a total of HK$138 billion debt issues were launched in 2008.

The Chinese Gold and Silver Exchange Society has been providing a platform for gold trading in Hong Kong since the early 20th Century. Turnover of 99 tael gold on the society totalled 3.2 million taels in 2006.

Hong Kong is also one of the most open insurance centres in the world. In July 2009, there were 172 authorised insurers, 89 of which were incorporated in Hong Kong and the remaining 83 were incorporated in 22 countries, with Bermuda taking the lead. The Insurance Companies Ordinance in Hong Kong provides for the authorisation and prudential supervision, by the IA, of all insurers carrying on insurance business in, or from, Hong Kong. It is the Government's policy to admit new insurers who are well established, financially sound and well managed. All insurers seeking authorization from the IA are subject to the same authorisation criteria and all authorised insurers are subject to the same prudential supervision, regardless of their place of incorporation. The gross premium for 2010 was about HK$207.2 billion. Hong Kong has established its position as one of the leading fund management centre in Asia with the largest concentration of international fund managers. Hong Kong is the second largest exchange-traded fund (ETF) market in Asia in terms of turnover and market capitalisation, with average daily turnover amounting to US$252 million in the first half of 2010 and market capitalisation reaching US$68 billion as of June 2010. The ETF market in Hong Kong has demonstrated remarkable growth. As of June 2010, there were 62 ETFs listed in Hong Kong, with 19 added in the first six months of 2010. To reinforce financial cooperation, the Chinese mainland and Hong Kong agreed under Supplement VII to CEPA to introduce an open-end, index-tracking ETF backed by portfolios of Hong Kong-listed stocks on the mainland. Hong Kong is well placed to capture the opportunities provided under the mainland's Qualified Domestic Institutional investor (QDII) scheme. As at March 31, 2009, there were 2 093 authorised unit trusts and mutual funds in Hong Kong. The net asset value of these authorised unit trusts and mutual funds as at December 31, 2008 totalled around HK$4,869 billion. The

introduction of the Mandatory Provident Fund (MPF) System in December 2000 has generated significant amounts of retirement assets, adding impetus to the further development of the financial markets. In August 1995, Hong Kong took a major step in enacting the Mandatory Provident Fund Schemes Ordinance, which provides the framework for the establishment of a privately managed, mandatory provident fund system. The ordinance was amended in March 1998 and supplemented by subsidiary regulations enacted in April 1998 and May 1999 respectively, setting out the detailed rules governing the operation of the MPF System and exemption of members covered by certain occupational retirement schemes. As contributions are mandatory, the Government has built into the MPF System a multiplicity of measures to ensure that MPF assets are safe and secure. The measures include stringent criteria for the approval of MPF trustees; prudential supervision to ensure compliance with standards and regulations; smooth and transparent operation of schemes; as well as a compensation fund mechanism to make good losses caused by illegal conduct. The MPF System has been implemented since December 2000. As at the end of June 2009, about 99.9 per cent of employers, 97.3 per cent of the relevant employees and 75.3 per cent of the self-employed persons have participated in MPF schemes. The MPF legislation has been under continual review to enhance the effectiveness and efficiency of the MPF System. A number of amendments to the legislation since the implementation of the MPF System have been enacted to promote its efficiency and effectiveness. The measure to improve the efficiency of the MPF system is the enactment of the Mandatory Provident Fund Schemes (Amendment) Ordinance 2009 in July 2009. Under the legislation, employees may transfer accrued benefits derived from their employee's mandatory contributions during their current employment from a

contribution account under a registered scheme on a lump-sum basis to another MPF scheme of their own choice at least once per calendar year. This will encourage more active management of MPF investment by the employees and allow employees access to a broader spectrum of MPF service providers, MPF schemes and funds for investment of mandatory contributions made by them during their current employment so as to promote greater market competition. MPF is a long-term investment. Hence, apart from creating new and additional demands for investment products, MPF also contributes to greater stability in the financial markets. By June 2009, accrued assets of MPF schemes reached HK$259.71billion (US$33.3 billion).

Hong Kong has a sizeable and active interbank market where wholesale Hong Kong dollar funds are transacted among banking institutions. The Hong Kong interbank bid and offer rates are important indicators of the liquidity situation in the financial system and are central to the pricing of Hong Kong dollar credits. Interbank funds have always been a major source of Hong Kong dollar funding for the banking system, particularly for those banks (mostly foreign incorporated institutions) not operating extensive retail networks. The interbank market is also the venue for those banks with a large customer deposit base to invest in short term loans. The monetary policy objective of Hong Kong is to maintain currency stability, defined as a stable external exchange value of the currency of Hong Kong, in terms of its exchange rate in the foreign exchange market against the US dollar, at around HK$7.80 to US$1. This is adopted having regard to Hong Kong being a highly externally-oriented economy. Stability of the external value of the currency has special significance to Hong Kong, both in terms of the nature of the businesses carried out in the territory and in terms of general

confidence. The Linked Exchange Rate System in Hong Kong was established in October 1983. It is characterised by Currency Board arrangements, requiring the Hong Kong dollar monetary base to be at least 100 per cent backed by, and changes in it to be 100 per cent matched by corresponding changes in, US dollar reserves held in the Exchange Fund at the fixed exchange rate of HK$7.80 to US$1. The monetary base includes banknotes and coins issued, the sum of the clearing accounts of licensed banks maintained with the HKMA – the Aggregate Balance – and the outstanding Exchange Fund paper. The Hong Kong dollar banknotes and coins are fully backed by, and their changes fully matched with corresponding changes in US dollars held by the Exchange Fund. Since September 1998, the HKMA has provided a clear undertaking to licensed banks to convert Hong Kong dollars in their clearing accounts into US dollars. On May 18, 2005 the HKMA introduced a strong-side Convertibility Undertaking to buy US dollars from licensed banks at 7.75, and announced the shifting of the existing weak-side Convertibility Undertaking from 7.80 to 7.85, so as to achieve symmetry around the Linked Rate of 7.80. Within the Convertibility Zone defined by the levels of the Convertibility Undertakings, the HKMA may choose to conduct market operations consistent with Currency Board principles with the aim of promoting the smooth functioning of the money and foreign exchange markets.

Over the past decade, a number of measures have been taken to promote the development of the local debt market, including the issuance of Exchange Fund Bills and Notes (EFBN), and the establishment of the Central Moneymarkets Unit (CMU). The Exchange Fund paper programme has encouraged the growth of the debt market by supplying high quality Hong Kong dollar debt paper and

providing a benchmark yield curve for Hong Kong dollar debt. The establishment of the CMU provides an efficient clearing and settlement system for Hong Kong dollar as well as non-Hong Kong dollar denominated bonds, while the linkages with other overseas clearing systems facilitate cross border investment in debt instruments. Other initiatives include allowing the use of Exchange Fund paper as margin collateral for trading futures, index options and stock options. The listing of Exchange Fund Notes on the SEHK since August 1999, broadens the investor base to include retail investors. This paves the way for the listing of debt securities issued by other corporations such as the Hong Kong Mortgage Corporation (HKMC), which has listed its Notes on the SEHK since October 1999. In addition to the Hong Kong dollar real-time-gross-settlement (RTGS) System, the HKMA launched the US Dollar and Euro RTGS Systems in 2000 and 2003 respectively, which facilitates the efficient settlement of US dollar and euro denominated debt securities on a real-time basis within the Asian time zone. In 2007 the HKMA launched the Renminbi RTGS System to cater for clearing and settlement of the renminbi in Hong Kong. To help participating banks to better serve their customers in the region and give them a longer processing window to manage their liquidity positions, the operating hours of the four RTGS systems and the CMU were extended from 5:30 p.m. to 6:30 p.m. in November 2008. The HKEx introduced the three-year Exchange Fund Notes futures contract in November 2001 so as to provide a risk management instrument for the debt market. To encourage bond listings, the HKEx reduced the listing fees for debt securities from July 1, 2002. Besides, the government put forward a number of measures to streamline the regulations and procedures in issuing and listing debt securities. Continued efforts have been made to enhance the retail bond market, including

lowering the minimum denomination requirement for eligible debt securities for tax concession purposes in 1999 from HK$500,000 to HK$50,000; educating the public about bond investment; reviewing the regulations relating to the public offering of debt securities; the issuance of bonds targeting at retail investors through the bank network by the HKMC since 2001; and the launch of retail Exchange Fund Notes. The implementation of the MPF System in December 2000 added impetus to the further growth of the debt market as well as fund management business. The successful launch of two Government bond programmes in May and July 2004 has raised the awareness level and interest of the public in bonds and increased their investment choices. The overwhelming response from both retail and institutional investors have not only proved that Hong Kong possesses the expertise and infrastructure for large scale bond issuance, but also showed that there is a large potential demand for high quality bonds.

While economists and politicians are pointing out that Hong Kong may lose its edge to Shanghai, Hong Kong itself did make some good progress against other world-class international financial centres in the world. For example in year 2006, Hong Kong has surpassed New York and rivals London as the world's biggest market for initial public stock offerings, which is also an indication of the growing importance of China to Hong Kong in international finance. Hong Kong had been successfully positioned itself be a fund raising centre for both China enterprises and international companies. For example, Hong Kong's success in the year 2006 reflected to a considerable extent the initial public offering for Industrial & Commercial Bank of China, which had raised up to US$16 billion in Hong Kong and up to US$6 billion in Shanghai as well as the

Bank of China's US$10 billion initial public offering in the same year. It is anticipated that the growth of Hong Kong will continued be fuelled by the hungry China enterprises raising funds from overseas investors. Initial public offerings are also seen for Chinese companies involved in consumer goods, power, insurance, diversified industrial activities, mining, steel, real estate, retailing, telecommunications and transportation. Global hedge funds and private equity funds have been opening or expanding their offices in Hong Kong at a rapid pace. With the exception of Chinese technology companies listing on NASDAQ, so as to be traded on the same market as many comparable companies from around the world; most Chinese companies have preferred to stay closer to home with listings in Hong Kong or occasionally Shanghai. To a certain extent, it reflected the arbitrage activities or strategy of the Chinese enterprises to raise funds in jurisdictions where regulations are comparatively less austerity and strict than that of the China mainland.

2.2 Shanghai as an International Financial Centre – Rise and Fall

2.2.1 An Overview

China's sustained economic growth and accession to the World Trade Organization in 2001 have strengthened Shanghai's position as a regional trade and financial centre. According to China Statistics, Shanghai with population of over 22 million (including over 8 million migrants) is the most populous city in China. It is not only home to China's largest and busiest port, it is also an important economic centre, a hub of communications and a foreign trade port, as well as one of the country's most important scientific, technological, cultural and educational bases of China. According to China Statistics Yearbook 2011, in 2010, Shanghai's total GDP was 1.687 trillion RMB (US$256.3 billion) with GDP per capita of 76,000 RMB (US$11,540) with financial services, retail, and real estate being the three largest service industries The manufacturing and agricultural sectors accounted for 39.9 percent and 0.7 percent of the total output respectively. Average annual disposable income of Shanghai residents was about RMB 21,871.

2.2.2 Economic Development History of Shanghai

Assembling and summarising the previous research work regarding the history of Shanghai by Ji (2003), Lanning & Couling (1973) and Wasserstorm (2009), major historical events and developments that had substantial impact on the economic development of Shanghai were highlighted in the following sessions.

2.2.2.1 Ancient Years

Back to about 400 to 500 A.D. when the city of Shanghai has not yet been established, people living around that area relied on mainly fishing. It was not until about 700 A.D when shipping began to prosper and the Shanghai area was treated as a dockyard for uploading and downloading of goods on the back of the good geographical location which is centre at the eastern coast of China and the existence of good natural harbour. Considering the need for more infrastructure facilities to be built, Shanghai town was formally named and established in about 1200 A.D. by the Emperor of the Yuen Dynasty in China. Shanghai was the first city in China to see stocks, stock trading and stock exchanges. Stock trading started in Shanghai as early as 1860s. In 1891, the Shanghai Sharebrokers Association was established, which was regarded as the primitive form of stock bourses in China. Later in 1920 and 1921, the Shanghai Security Goods Exchange and the Shanghai Chinese Security Exchange commenced operations respectively.

2.2.2.1 The 1930s: Shanghai's Golden Age

Around 1930s, Shanghai was already the largest and richest city in Asia, and it held a unique position (now shared in Asia by Tokyo, Hong Kong, and Singapore) as the region's financial centre. By the 1930s, Shanghai had emerged as the financial centre of the Far East, where both Chinese and foreign

investors could trade stocks, debentures, government bonds and futures. In 1935 there were 164 banks in China; 58 had their head offices established in Shanghai.

The growth of Shanghai as an economic hub at that time was probably attributable to its centralized location on the eastern coasts of the China which greatly facilitated transportation (railways and water transportation) to major coastal cities in China. Shanghai owns a natural port where goods and products can be easily shipped. With these natural advantages, Shanghai has soon become a trading centre for merchants to come and trade their goods. Being the derived products of trading, financial services gained significant importance, which was in line with the rapid growth of economic activities in the region.

2.2.2.2 The Second World War and Civil War period (1940 - 1960)

Unfortunately, the outbreak of wars had changed the fate of Shanghai. Japan's aggression in the period from 1937-1945 and the subsequent civil war in China from 1946-1949 had destroyed Shanghai's status as an international financial centre. Japan began its aggression as early as September 1931, when its army suddenly seized China's Northeast Provinces (Manchuria). In January 1932, Shanghai itself became a combat zone, as Japanese army and navy launched a ferocious attack on the Chinese section of the city, but the major powers arranged an armistice after a month's fierce fighting. In July 1937, full-scale war broke out between China and Japan after the Marco Polo Incident, and

again Shanghai was the scene of heavy fighting for three months during August-November 1937. There was no peace for Shanghai for a long time. Simultaneously with the attack on Pearl Harbour in December 1941, the Japanese Army also marched into the International Settlement. Earlier, Japan took over the French Concession through its puppet regime after the fall of France in 1940. The end of World War II didn't bring peace to Shanghai for long. The WWII was soon followed by the revolutionary civil war of 1946-49. In 1946, Shanghai Securities Exchange Co. Ltd. was created on the basis of Chinese Security Exchange, but ceased operations three years later in 1949. After the establishment of the People's Republic of China (PRC), there were hopes for a gradual re-emergence of Shanghai as a regional financial centre. But China's involvement in the Korean War, and the subsequent United Nation and United States embargoes against China, dashed completely such hopes. After the Korean Armistice, one would have thought that Shanghai could finally begin to regain its pre-war eminence. However, Beijing at that time chose to turn its back on Shanghai as an international financial centre, for various reasons. First, the ideologues, then in ascendancy in Beijing, regarded Shanghai's financial services industry as a hotbed of speculation and other capitalist iniquities that needed to be curbed rather than promoted. Second, Marxist economics and ideology tend to downgrade and neglect the role of the service sector, especially financial services. Third, China had already enthusiastically embraced the Soviet model of planned economy, and the associated development strategy of inward-looking industrialization, with special preference to the heavy industries.

From 1949 to 1979, the Chinese Government pursued “financial repression”. Maoist China’s xenophobia and the Marxist dogma that finance is “unproductive” resulted in financial repression of the most extreme type in China in the 1950s. Foreign banks and other financial intermediaries were driven out of the country because of low market demand for financial services, which is attributable to China’s central planning policy and “closed door policy”. Private Chinese banks were first reorganized into “joint public-private banks” and later nationalized by merging them with the People’s Bank; other non-bank financial institutions were either nationalized or closed; all financial markets, such as securities markets, forex markets, inter-bank market, gold and silver markets etc. were closed. Under China’s socialist economy, resources were centrally allocated by the government in accordance with its policy. Price no longer served as a tool for efficient resources allocation. Shanghai was hard hit: it lost not only its IFC status, but also its “national financial centre” status. Like other cities, Shanghai had had to endure some catastrophic political movements, especially the “Great Leap Forward” of 1958-60 and the China Cultural Revolution of 1966-76. Indeed, at the height of the China Cultural Revolution, even some Government banks were downgraded, merged, or closed, the idea being to form, according to Lenin’s prescription, an all-embracing monobank.

2.2.2.3 Financial Sector Reforms in China and opening to the outside world (1970s to 1990s)

Under the leadership of Deng Xiaoping, the economic reform and opening to the world policies launched in 1979 gave a new lease of life to China. In 1979, China embarked on a gradual but far-reaching economic reform. Since then, China's economy has been significantly modernized and opened up to the rest of the world. Beginning from 1980, China established five special economic zones in Shenzhen, Zhuhai and Shantou in Guangdong Province, Xiamen in Fujian Province, and Hainan Province. In 1984 China further opened 14 coastal cities to the outside world (i.e. Dalian, Qinhuangdao, Tianjin, Yantai, Qingdao, Lianyungang, Nantong, Shanghai, Ningbo, Wenzhou, Fuzhou, Guangzhou, Zhanjiang and Beihai). Starting from 1985 China listed the Yangtze River Delta, Pearl River (Zhujiang) Delta, South Fujian Triangle, Shandong Peninsula, Liaodong Peninsula, Hebei and Guangxi as the economic open areas, thus forming an open coastal economic belt. It seems like Shanghai was relatively neglected compared with other special economic zones. Although the normalization of the financial sector during the 1980s, such as the restoration of the original functions of the Agricultural Bank, the Bank of China, and the Bank of Communications, the establishment of new banks such as the Industrial and Commercial Bank, the transformation of the People's Bank from a monobank into a Central Bank, the reopening of insurance companies etc., were also beneficial to Shanghai, it was not until 1990 that a real impetus was given to Shanghai's re-emergence as a financial centre.

Since 1980, China's securities market has evolved in tandem with the country's introduction of reform and opening up policy and the development of socialist market economy. In 1981, trading in treasury bonds was resumed. In 1984, stocks and enterprise bonds emerged in Shanghai and a few other cities. On November 26, 1990, Shanghai Stock Exchange (SSE) came into existence, and on December 19 of the same year, it started formal operations.

Financial sector development is a complex and multifaceted process. It involves the balanced development of three essential elements: institutions, instruments, plus markets and people. Institution building started in the early years of reform with the establishment of a two-tier banking system. Gradually, the People's Bank of China (PBC) divested all its "commercial" activities. In 1984, the PBC became China's central bank. However, monetary and credit policy continued to take the form of a credit plan that was implemented through a set of credit quotas for each bank and direct bank financing of enterprises. Since the credit plan was an aggregation of sector and local financing needs done from the bottom up, an expansionary bias was inherent in the system. This impaired the PBC's ability to manage monetary developments--a problem that was not really addressed until 1992-93, when work on a new central bank law started. Central banking received a new impetus in 1995 when this law was enacted, giving the central bank the legal foundation to operate in a market environment under the leadership of the State Council.

Despite the above-mentioned dilemma, monetary policy's role in macroeconomic management has significantly increased. Although PBC did not subscribed to the Basel Accord, it has introduced reserve requirements and

lending facilities to commercial banks to support its monetary policy actions, which remained guided by the credit plan. However, the effectiveness of the credit plan has been decreasing since the late 1980s, mainly because its institutional coverage has lagged behind the expansion of the banking sector. In 1994, direct central bank lending to the government was discontinued, and preparations for increased reliance on indirect monetary policy instruments were started in earnest. These changes have signalled the start of the phasing out of the credit plan. One rooted problem of China at that time was that there were two main groups of voices, one insisted the philosophy of socialism and demanded China to continue strictly carrying out the socialism which was learned from Russia. Another emerging voice was that China should develop its own way of socialism or China-featured socialism and open its market. It was not until 1992, when the Communism Party of China officially recognized that a market system was not incompatible with the ideals of socialism and subsequently proclaimed the idea of establishing a "socialist market economy." The concept of a socialist market economy implies an economy in which market mechanisms govern economic interactions but the public sector maintains ownership of the most important means of production. In the wake of this decision, the Chinese leadership under Mr. Deng Xiaoping outlined and approved a comprehensive reform strategy for the remainder of the century. This strategy explicitly mentioned financial reform as a key element in efforts to create efficient financial markets in order to strengthen the authorities' capability to carry out macroeconomic management using indirect monetary instruments.

Similar to most reforms, financial reform does not follow a rigid, comprehensive blueprint but instead has been characterized by pragmatism and gradualism. In

fact, it was the Chinese leaders not intending to bring a market economy to China when they launched the reform program. Instead, their ideal was just to "perfect" the existing public ownership-based planned economy by improving people incentives and developed what they named, "Socialist Market Economy". The reform in China has been evolutionary rather than revolutionary. The policy maker adopted the small-scale experimental approaches--which were subsequently adopted, in some instances, on a national scale if successful. Examples of this approach in the financial sector include opening local interbank centres in selected cities in 1986 and secondary markets in government securities in six cities in 1988. In both instances, other cities were allowed to pursue these courses of action after the authorities had received sufficient indications that the initial experiments had been successful. The establishment of stock exchanges at the end of the 1980s is a third example.

Before 1990s, the development of financial instruments has been limited to the capital market. Local interbank centres have been emerging since 1986. Although they have played a useful role in the local redistribution of surplus funds, they have not operated as interbank markets in the traditional sense. Since Non-Bank Financial Institutions ("NBFIs") and even some enterprises can participate, these centres often serve as channels for long-term financing of nonbank and nonfinancial institutions, thereby circumventing the credit plan.

Market development has made significant strides in the foreign exchange sector. The establishment of swap centres in 1986 marked the introduction of an embryonic foreign exchange market in China. Until 1992-93, turnover in this market, which was organized under the supervision of the State Administration

for Exchange Control, grew steadily. A new phase started at the beginning of 1994, when the exchange rates between the different swap centres (swap rates) were unified and one national foreign exchange market was created. At the same time, the official rate and swap rate were unified.

Starting from late 1990s, the Chinese government had decided to liberalize the regulation and lift restrictions in the stock market. Instead of relying solely on bank borrowing, companies started to raise capital through public issue and listing. The importance of the stock market as a channel of capital raising increased. The demand for the derived financial services grew.

In 1990s the Chinese government developed and opened the Shanghai Pudong New Zone[4], as well as an additional number of cities along the Yangtze River, thus forming the Yangtze River Open Belt with Shanghai Pudong as the leader. On April 18th, 1990, the Chinese government announced to the world the development and opening up of Pudong, giving it the role of a "locomotive" in the development and opening up of other urban centres along the Yangtze River and decreeing that Shanghai build itself in the shortest time possible into an international economic, finance and trade centre, thus enabling the economy of the Yangtze Delta and the whole Yangtze Valley to take a fresh lift-off. As a base for the development of Hi-Tech industry and up-to-date manufacturing sector, the Shanghai Pudong Area is a new economic growth point of Shanghai and the focus and symbol of China's efforts at reform and opening up in the 1990's. Pudong, benefits from its being given a pilot role in China's reform and

[4] The Pudong New Area, a 350 square kilometre triangular area east of the Huangpu River, is itself divided into several sub-areas, of which the Liujiazui-Huamu sub-area, opposite the famous Bund, is earmarked for the broadly defined financial sector, namely banking and finance, real estate, and business services.

opening up and having a sound, efficiently functioning administration and harmonious social relationships and social environment, is widely acclaimed as "the gateway to China's economy", a golden key to the china market" and "the bridge linking China to the world economy. As for Shanghai's role as a financial centre, at present, Shanghai is home to around 700 international and Chinese financial institutions. After two decades of rapid development, Shanghai Stock Exchange has entered into a new stage with rapidly enlarging market scale, more enhanced fundamental facilities and continuous improved regulation level. After decades of development, Shanghai Stock Exchange has significantly enhanced its technological advantages. It has put into operation the world's most advanced new generation trading system (NGTS), built the global largest stock exchange database, launched a powerful and robust new generation website and established a first-class computer room. In addition, Shanghai Stock Exchange has built a nation-wide securities-specific satellite communication network with complete functions and the largest user base in China. Shanghai Stock Exchange has established a robust and real-time market monitoring system appropriate for market operations. It has put in place a self-regulatory framework that focuses on supervision of listed companies, SSE members and the securities market.

According to the official published data on the website of the Shanghai Stock Exchange, in 2010, the total turnover on Shanghai Stock Exchange was RMB 39,839.573 billion. Stock transactions were RMB 30431.201 billion, representing 76.38% of the total turnover. Bond transactions hit RMB 7491.443 billion, accounting for 18.8% of the total turnover. Fund transactions reached RMB 477.17 billion, making up 1.2% of the total. Warrant transactions stood at

RMB 1439.758 billion, constituting 3.61% of the total. The average daily stock transactions were RMB 125.749 billion; daily bond transactions stood at RMB 30.956 billion and daily fund transactions hit RMB 1.972 billion. Daily warrant transactions were RMB 5.949 billion.

At present, Shanghai's stock exchange was the country's largest and most active exchange with turnover exceeding that of Hong Kong. The turnover of Shanghai's stock exchange is already the second largest in Asia, and in terms of market capitalization it is number 4 in the world. Regarding fund raising, at the end of 2010, there were 894 listed companies on Shanghai Stock Exchange, with 28 new listings in 2010 (including 2 holistic listings). By the end of 2010, there were 938 listed stocks on SSE with a total market capitalization of RMB 17,900.724 billion, and free-float market capitalization of RMB 14,233.744 billion. The 2010-end total share capital of all the listed companies reached 2,193.951billion shares, of which 16,031.3 billion shares or 73.07% were tradable. In 2010, the total amount of equity funds raised was RMB 553.214 billion, ranking Shanghai Stock Exchange at No. 4 globally and No. 3in Asia. Furthermore, Shanghai is home to the national interbank funds market, the interbank foreign ex-change trading system, and boasted a variety of national commodities exchanges. Also, The Shanghai gold spot market is the largest of its kind worldwide and, with about 250,000 employees in the financial service industry. In 2010, the People's Bank of China (PBC) in conjunction with National Development and Reform Commission (NDRC), Ministry of Industry and Information Technology (MIIT), Ministry of Finance (MOF), State Administration of Taxation (SAT) and China Securities Regulatory Commission (CSRC) jointly issued Guiding Opinions on the Promotion of the Gold Market,

stating that gold market growth is not only an integral part of China's financial market, but also a necessity to meet people's needs. In 2010, China's gold mining industry saw the gold production score a new high on the basis of sustainable development, ranking first in the world for four consecutive years. The physical gold market at Shanghai Gold Exchange (SGE), the gold futures market at Shanghai Futures Exchange (SHFE), and the OTC gold market at commercial banks were all developing very fast. In 2010, China's gold production, profit, total industrial output value and other major industrial indicators all topped historical highs. China's gold production in 2010 amounted to 340.876 tons at a new record high to 26.896 tons, remaining Top 1 in the world for four consecutive years. In 2010, the gold industry achieved a gross industrial output value of RMB 229.2879 billion. Shanghai is closing the gap with Hong Kong (Loechel, 2010).

Having looked into the historical development of both Hong Kong and Shanghai, we shall then review in the next chapter some of the key economic theories, studies which may give us more insights in identifying the various factors and/or attributes that are related to the development of these two cities into international financial centres.

Chapter 3: Theories on the Development of an International Financial Centre: - A Literature Review

This chapter consists of a review some of the key economic theories and previous studies that are related to the economic growth or emergence of an international financial centre. By the end of this Chapter, it is anticipated that we should be able to have a general theoretical picture and insight on what are the key contributors to the development of an international financial centre. Feedback from market practitioners was then collected based on these identified anticipated contributors in relation to Hong Kong and Shanghai for analysis (Chapter 5) and there would be a discussion of the prospect of the two places (Chapter 6). To start, I shall begin with reviewing the definition and classification of a financial centre.

3.1 Definition and Classification of a financial centre

The determinants of financial centres have long been studied by academic researchers. One of the most renowned publications is perhaps Robert's (1994) four-volume collection of articles and essays on financial centres of the world.

At the most general level,

"……. a financial centre can be described as a place where there is high concentration of financial intermediaries (such as banks, securities trading companies, insurance companies, etc.), and in which a comprehensive set of financial markets are allowed to exist and develop, so that financial activities and transactions can be effectuated more effectively and efficiently…… … "

----- *[Robert (1994)]*

A dictionary definition of financial centre also gives a similar description:

"..... City or its district (1) that has a heavy concentration of financial institutions, (2) that offers a highly developed commercial and communications infrastructure, and (3) where a great number of domestic and international trading transactions are conducted....."----- *[Business Dictionary]*

Jao (1997) pointed out three typologies of financial centres from three different perspectives: (1) geographical perspective; (2) teleological perspective; and (3) functional perspective. From a geographical standpoint, financial centres can be classified according to the scope, or at least the main focus, of their activities. Within a nation or a country, the smallest financial centre could be the sub-national financial centre, such as Shenzhen in South China, Los Angeles in US California, Munich in South Germany, etc. Sub-national financial centre can be seen as a financial centre within a certain region in a single country. For the country as a whole, we can define the largest financial centre of a country as national financial centre. Examples of a national financial centre include

Tokyo in Japan, London in United Kingdom, New York in United States, Shanghai in China, Sydney in Australia, etc. Once the business of a financial centre outgrows its national boundary and becomes a key financial service provider to companies and institutions in nearby countries within a region, it then becomes a regional financial centre. Some examples of well-defined regions include: Europe, America, the Middle East, Asia-Pacific, etc. Once the business of a regional financial centre outgrows its regional boundary and extend beyond the region where it serves, it will gradually become a global centre. Some of the examples are London, New York, Tokyo, etc. To bridge the difference or gap of terminology, for this research, the concept of an international financial centre encompasses both regional and global financial centres, though the geographical domain of the latter is, of course, the largest. Hence, in other words, it will be of our interest provided the city offers not only domestic financial services but also serves the financial service need internationally across the border, it is included in our definition of international financial centre. Other than defining a financial centre on geographic basis, there are researchers defining or classifying a financial centre on other perspectives. While we shall also discuss the various ways of defining and classifying a financial centre, as our paper is about the studying of Hong Kong and Shanghai whereas these two places are by nature geographical locations, we shall therefore adopt the geographical basis to define whether a financial centre is international or not.

McCarthy (1979), from a teleological point of view, makes a useful distinction between a paper centre and a functional centre. According to McCarthy (1979), a paper centre is defined as a location for recording financial transactions only

with little or no actual banking or financial business being carried out there. Some transnational financial institutions find it convenient, for example, to keep "shell" offices in jurisdictions where taxes and prudential regulations are less demanding and costly, in order to minimize their overall costs. Examples of paper centres are the Bahamas, Bahrain, the Cayman Islands, and Jersey. On the other hand, a functional centre is one in which financial services and transactions of all kinds, including deposit taking, lending, foreign exchange dealings, and dealing in securities, etc for the host country. For the purpose of this research, we shall focus on mainly functional centre.

Within the category of functional centre, Jao (1980, 1988) distinguishes between an integrated centre and a segregated centre. An integrated centre refers to the integration of providing financial services to both onshore markets and offshore markets. Financial institutions in the integrated centre can engage in both onshore and offshore business without restriction. In contrast, a segregated centre is one in which the authorities make clear distinctions between onshore and offshore markets, or between domestic- currency-denominated and foreign-currency-denominated businesses. It is common that in a segregated centre, non-domestic institutions are mostly confined to the offshore sector or in other words, they are either barred from, or severely restricted in, the onshore sector. There are some financial centres, however, combine the features of both, so that a limited number of authorized institutions can engage fully in both onshore and offshore businesses. Hong Kong, Tokyo, London, etc, are example of integrated centres while Shanghai, Bangkok, Kuala Lumpur, etc, are example of segregated centres.

Dufey and Giddy (1978) classify financial centres into three major types in accordance to the services they provide and their stages of development: (1) traditional centre - a net creditor to the world through bank lending and securities market activities such as underwriting, placements, etc. Typical examples London, New York, Tokyo; (2) financial entrepot - a centre that offers the services of its domestic financial institutions, money markets, and securities markets to both domestic and foreign residents. Examples are London since the end of World War II, and especially since the rise of the Eurocurrency market in the late 1950s, and New York since the late seventies; (3) offshore banking centre - a centre in which financial intermediation is performed primarily for non-resident borrowers and depositors. Although there can occasionally be some domestic resident participation in the offshore sector, the domestic financial sector is typically insulated from the offshore sector.

Park (1982) classified financial centres into four types: (1) primary, (2) booking, (3) funding, and (4) collection. A primary centre is one whose sources and uses of funds are worldwide; examples are London and New York. A booking centre, which corresponds to McCarthy's paper centre, is only a location for booking. A funding centre mainly facilitates inward financial intermediation to channel offshore funds from abroad to local. Park suggested Singapore and Panama as examples. In contrast, a collection centre engages in outward intermediation by channelling excess domestic funds to abroad. Bahrain was named as an example.

The British economist, Jones (1992), proposes a 3-fold classification: Type A is the sub-regional centre, which is somewhere between a national centre and a

regional centre, the term "region" here denoting a territorial area larger than a country, such as Asia, but not an area within a country; Type B is the regional centre; and Type C is the global centre. A number of financial centres in Asia and the Middle East were included in his classification. According to this classification, for the period 1919-39, Shanghai, Hong Kong and Singapore were the Type A (or sub-regional) centres, but Shanghai was the largest, with Hong Kong "being essentially a smaller version of Shanghai throughout the interwar years". For the period 1945-65, Shanghai dropped out, and Hong Kong, Singapore and Beirut were the three Type B (or regional) centres. For the subsequent period 1965-75, Beirut dropped out due to its civil war, and Bahrain, Hong Kong, Singapore and Sydney became the four Type B (or regional) centres. Type C global centres consisted of New York and London for most of the time.

In summary, based on the captioned classification and with the above typologies in mind, we can characterize both Shanghai and Hong Kong as functional centres, not paper centres, because real financial business is done in both cities and both of them do generate income and employment. Shanghai however is a segregated centre, because it allows foreign banks to undertake only limited *renminbi* (RMB) business, while Hong Kong is a fully integrated centre, as it allows foreign banks and other financial institutions unlimited freedom in transacting all kinds of financial business, whether denominated in Hong Kong dollar or foreign currencies. From the geographical standpoint, Shanghai is better defined as a national centre. Hong Kong, is already an international financial centre, but is only a regional centre for Asia-Pacific region, not yet a global centre. Neither Shanghai nor Hong Kong has a formal offshore sector,

but both, especially Hong Kong, perform the role of financial entrepot, providing banking services to both domestic and international corporations.

In addition to the discussion regarding the role of a functional financial centre to provide financial services such as banking services to real economic development, a well-developed stock market (both primary and secondary market) is also an important element of an international financial centre. From a stock market perspective, the development of an international financial centre also relates to the attraction of more (foreign) listings with corresponding trading volume and business opportunities relative to rival financial centres.

This explicitly raises questions about what factors make some financial centres and the stock markets more attractive than others and why? The adopted approach in addressing these questions is based on the assumption that the listing decision of firms is likely to depend not only on the characteristics of a specific stock exchange but also on the institutional features of the country and the corresponding financial centre in which the exchange is located. Generally, there exist large differences between financial centres regarding these characteristics. As a consequence, not all financial centres are equally adaptive to changing market conditions. This results in centres improving their competitive position in those market segments and geographical areas which reflect their superior capabilities. Hence, accordingly, much of the discussion about competition and complementarily between financial centres rests on concepts of comparative advantage and `territorial' competition.

From a multidimensional analytic framework perspective, we may specify two mutually dependent dimensions. First, a financial centre could represent a concentration of financial activity in a physical space, or in other words, this concentration is confined to a physical area within an urban agglomeration with unique characteristics and endowments. Financial service productions occur in `territories' with specific market segments, such as stock, commodities, or derivatives markets, etc. Second, the firms and markets located in the financial centre determine its spatial scope. For example, from a stock market perspective, the locations of the firms which have a public listing on a financial centre's stock exchange represent the hinterland. Therefore, the hinterland represents the centre's action space, whereas the exterior refers to the worldwide spatial organization of financial institutions and markets to which the centre is attached. In this context the financial centre has a twin role in its respective operation and orientation due to its functioning in the hinterland as well as in the exterior. In linking both dimensions, the framework pointed out that the financial centre is the best access point for the profitable exploitation of valuable resources and information. Primarily due to economies of localization - like, among others, a pool of specialized labour, intermediate services, and information networks - the centre functions as a point of intersection, connecting resources and information flows from the hinterland and the exterior and vice versa.

In summary, for this research, we shall define international financial centres as those financial centres where there are financial activities functional and international in nature on geographical basis.

3.2 A Review of Key Economic Theories

To become a financial centre, from the geographical perspective as discussed early, a development into a city is a pre-requisite. One way to look at it is that in the process of city development, it was not uncommon that labour-intensive stage of production was relocated from Organization for Economic Cooperation and Development (OECD) countries to the Third World countries to take advantage of the lower labour costs (Frobel, Heinrichs and Kreye, 1980). Hence, we might argue that city development is due to "spill-over" from current mega cities where producers are looking around for places where they can produce their products in a lower cost manner.

However, if it is true and if it is the major trigger for city development, we would have seen factories dispersed quickly and widely to many places and cities will be of similar size with factories spreading to wherever places with lower labour cost of production. However, a low labour cost should not be a sufficient condition for a place to be developed into a city as we do also see places with higher labour cost but still continue growing bigger in size.

The emergence of new mega cities lead to another observation that international cities serve as the command and control centre. Their spatially decentralized but managerially coordinated systems of production were linked to revolutionary changes in rapid transport networks and telecommunications. This perception of a city brought up the importance of other factors which may help establish or strengthen the capability of a place being a coordinating or

commanding centre. As we had discussed before (Chapter 2), the early development of Hong Kong and Shanghai to a certain extent rely on the economic development and needs of the peripheral areas.

3.2.1 Demand and Supply theory

The classic theory of demand and supply, mentioned by Adam Smith (1776) in his book, *The Wealth of Nations*, is perhaps one of the earliest established economic theories and the cornerstone of economics. Financial service plays a very important role to support and facilitate many real economic activities and functions, such as manufacturing, wholesale, trades, capital raising, construction, and investment. Demand for financial services refers to how much (quantity) financial service is needed due to the related economic activities. Economic growth, coupled with the expansion of international trade, gives rise to increasing demand for financial services. On the other hand, supply refer to how much finance service a place / city can offer which will be directly related to the resources and capability that the place / city has to provide the service. In other words, only those cities which have invested heavily in the requisite infrastructure and which provide state-of-the-art information technology to the financial centre, can meet this demand.

From the country perspective, the relationship between demand and supply underlie the forces behind the allocation of resources and hence has a direct impact on whether a certain place / city will be “chosen” (either by invisible hands or government policy) to be developed into a financial centre amid fierce

competition with other places / cities within the country. In market economy theories, demand and supply theory will allocate resources in the most efficient way possible. The quantity of resources to be employed to develop a place / city into a financial centre will not only be determined by the equilibrium price through the interaction of demand and supply but also take into consideration the comparative advantages of various places / cities to become a financial centre.

In other words, although the demand and supply theory is such a basic economic concept, it indeed plays a very important role in allocation of resources and is an underlying driving force of developing a place into a financial centre. A growing demand for financial services to support an increasing volume of international trade will attract the influx of foreign finance institutions and hence will in turn later attract a sustained development and growth in capital market. For the Hong Kong case, the economic growth is attributed to growing demand of international trade between southern China and other places in the world, in particular, Southeast Asia countries. For the Shanghai case, its economic development before the 1940s was largely fuelled by its role as an international trade hub between China and the Western countries. Although Shanghai's role as a financial centre deteriorated following China's "closed door policy" and central planning policy after the Second World War and Civil War, Shanghai behaved like a "sleeping tiger" since then until China determined to "open" its "door" again in 1979. Shanghai soon regained its role as China's financial centre in light of the high growth in demand for financial services from the increasing volume of international trade and strong economic growth of China in recent decades. The Congress of China announced in 2009 a plan to develop

Shanghai as an international financial centre by the year 2020 (Shanghai Daily 26 March 2009)

3.2.2 Location Theory

Further to the fundamental economic theory on supply and demand, there were some researchers who explored the formation and establishment of a city with respect to its location. Despite these theories were developed based on transportation costs for tangible goods which may not be directly related to the production and delivery of intangible service, they are, however, some of the cornerstone theories in relation to the development of a city which could be the first step before a city can further be developed into a financial centre or later an international financial centre. Furthermore as one of the major functions of provision of financial services is to support the real economic business activities, hence, these location-related theories are also indirectly related to the formation of international financial centre. Johann Heinrich von Thünen published the first volume of Der Isolierte Staat in 1826 and noted that the costs of transporting goods consumed some of economic rents. Transportation costs and, of course, economic rents, varies across goods, different land uses and use intensities will result with distance from the marketplace. Based on the location theory, firms will choose a location to minimize its transportation costs. From the manufacturing perspective, assuming a production plant requires two factors of production, A and B, which are available at the site AA and BB respectively and the finished product, C, is to be delivered and consumed at site

CC, then the optimal location of the plant to minimize the aggregated transportation cost of the factors of production and the finished product is given by:

Objective function: $MIN\ [C_F(A) + C_F(B) + C_T(A) + C_T(B) + C_T(A+B)]$

where $C_F(A)$ = *factor cost of production for A*

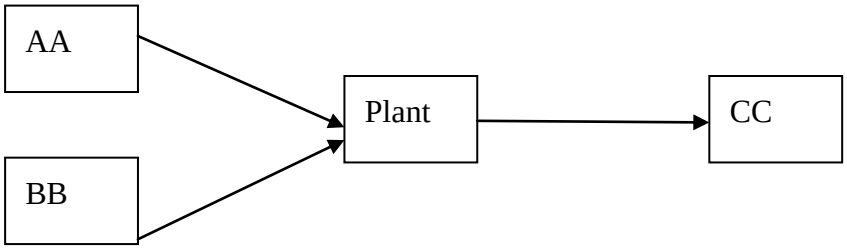
$C_F(B)$ = *factor cost of production for B*

$C_T(A)$ = *Transportation cost of factor A to Plant location*

$C_T(B)$ = *Transportation cost of factor B to Plant location*

$C_T(A+B)$ = *Transportation cost of product from plant to CC*

Figure 3.1 – Location Theory



Putting it in the context of the development of financial centres, based on the location theory, the formation of financial centres could concentrate on the transportation cost of the factors of production and finished products, which are affected by the location of the financial centre. For the provision of financial services, despite both the "factors of production" and "finished product" are service in nature, which are delivered on the spot, the availability of suitable and skilled labour could be one of the key factors of production which will be

impacted by the location decision. From the supply side, among the four factors of production, the mobility of land and skilled labour is perhaps the least and more costly, hence, for financial services industry, despite the transportation cost in the provision of "products" is less significant than that for tangible product in the manufacturing sector, it does play a role, even though may be of a lesser extent through the transportation cost required to secure the appropriate skilled labour. From the demand side, the location of financial hub could be largely determined by place of delivery of the services (the area or place where financial service is most needed).

In addition, as the delivery cost of services, to a large extent, depends on the infrastructure and scale of business. Hence, compared to other industries, economies of scale and government's support in the infrastructure investment, education, training of required workforce, etc., tend to play an important role regarding the formation and development of a financial centre from the cost minimization perspective.

Yet, there are various dialects of Location Theories. In the central work of Thünen (1826), *Der isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie* (1826), Thünen developed the Agricultural Location Theory establishing hierarchisation criteria surrounding a consumer market. Although this theory might be originated from the agriculture industry, we might get some useful insight from this theory. According to the theory and based on the presumption of perfect competition, the author took into consideration uniform soil fertility as well as quality and availability of transportation in all directions. Other hypotheses offered by the model are: the location of agricultural activities

is around an isolated urban centre, independent from the rest of the economic system; the agricultural producers keep only a basic commercial relationship with the urban centre. An area is distinguished from another through its bigger or smaller distance to the consumer centre and to the "location rent gradient", that is, the price the economic units are willing to pay for the area, which varies according to its distance to the market: the further it is from it, the smaller the location rent will be. According to the model, when the income gradients, (function of income in relation to distance) are intersected and the total income is maximised, there are conditions for the formation of the strips of land which form the "belts" of various cultures around the market. The relative position of the "rings" of each good will depend on the unitary cost of transportation – the higher it is the smaller the transportability of goods and, therefore, the production should be located closer to the consumer centre. In addition, it will depend on the physical income by unit of area – the bigger it is the better the use of space, which makes it more likely that activities physically more intensive are located close to the market. Thus, it establishes a simple hierarchy of the various activities in "rings", showing the emergence of location advantage standards in the use of agricultural land. The theory may be considered as a general theory of micro-location regarding a consumer centre. It is important to note that if we shift the theory to the context of cities or financial centres, we shall need to interpret the cost and rents slightly differently. Although financial services is intangible in nature, in the old days financial services were predominately lending and borrowing activities, the provision of such services will be associated with higher costs (including opportunity costs) due to additional time needed if the financial services provider is located far away from the clients. Hence, it might suggest that financial services hub should be

developed in a belt not too far away from the real economic activities taking places which required financial services.

In the book *Theory of the location of industries,* from 1969 (originally published in 1909), Alfred Weber's (1969) main concern was to study the location of industries. The author attempted to build a pure theory by determining the forces which guide the locational decision of firms and by formulating the laws that rule the action of such forces. Weber's theory is initiated based on the following propositions: a) consumers are concentrated in specific points; b) the price of goods is homogenous in space and the technical coefficients of production are constant; c) the places where there is availability of labour are considered given and their offer is infinitely elastic; d) the sources of labour are unequally distributed in space, divided between ubiquities (obtained at any point and not having locational impulse, therefore) and localized materials[5] (available only in some well-defined localities, thus influencing the choice of place); and e) the transportation rate for raw-material and for the final goods are identical and constant. According to Weber, the three factors which influence the location decision of the industries are: cost of transportation; cost of labour and the agglomerative forces. The productive units act freely as they define the place where they will be installed, trying to minimize the total cost in alternative places, without risks and uncertainties. In Weber's opinion, the industry always tends to be located at the point where the cost of transportation is the lowest. This would be the first location orientation. Next, the labour cost is considered the second location factor. This idea comes from the assumption that

[5] Localized materials can be either "pure materials" – which imparts its total weight to the product – or "gross materials" – which suffer a loss of weight in the process of manufacture.

industries will only be attracted to places where labour costs are more favourable to the producer, in cases where the saving with labour exceeds the additional transportation cost for the industry, since it will no longer be in the point of minimal transportation cost. The third factor is the agglomerative force which refers to concentrating industries in a given region in a given region. We shall discuss this agglomerative force later in this chapter.

August Lösch (1954) developed a theory of organization of regions with his model's basic hypotheses built on the assumptions: a) the raw-material and inputs necessary to production are ubiquitous; b) there are uniform conditions of transportation; c) there is a uniform distribution of population in space; d) the tastes and preferences of consumers are uniform; e) technological knowledge is uniform; f) each product has a specific demand curve – which varies according to the demographic density and the cost of transportation to the production centre brought upon the consumer. Lösch (1954) emphasised the location interdependence and assumed the market is under a regime of imperfect competition. The monopolistic competition emerges through the introduction of spatial dimension in Lösch's analysis (1954) and accessibility is the factor of differentiation of products. Based on this structure, Lösch (1954) shows how different market areas and a hierarchy urban system are formed, deriving from a homogenous space. According to Lösch (1954), as the global demand for industries' products increases, it should achieve economies of scale. This factor triggers the process of location inequality, since the company starts to broaden its market area. After some time, balance is reached, when the gains of scale do not compensate for the increase in the transportation expenses. This will discourage consumption in this market, opening the possibility for analogous

production located in another point in space. Lösch's (1954) model could be used further in the theoretical construction of the system of cities. In his work, the author shows that even in the presence of totally homogenous space the population ends up spreading out in a heterogeneous way. It is argued that the bigger the urban growth is the bigger its diversification and capacity to incorporate smaller urban centres which will constitute its market area. This idea will be developed in Walter Christäller's Central Place Theory (1966) and Jane Jacobs's Theory of Urban Growth (1975) later in this chapter.

3.2.3 Central Place Theory

Central Place Theory can be seen as a derivative of the traditional location theories as the traditional location theories did not place adequate emphasis on the importance of services. Christäller (1966) was an author who worked with location of activities directed to the market, among which services are included. In the volume entitled "*Central Places in South Germany*[6]", Chiställer developed the basis for the understanding of a system of complementary and interdependent cities. Christäller (1966) defined centrality as the relative importance of a place regarding the region that surrounds it. According to Christäller (1966), the central goods and services are necessarily produced and offered in only a few places because some functions of the city are executed through activities that must be centrally located. Hence, according to Christäller (1966), the more specialised the goods and services are, the more concentrated they will be. In other words, the offer of basic services and goods

[6] Originally published in 1933

will be scattered and found in many places. Christäller (1966) pointed out that the existence of central places is primarily related to

(a) Demographic density -- the bigger it is the bigger the demand for central goods and services will be;

(b) Income distribution -- the better it is, the bigger the growth of central places;

(c) Per capita income -- positively related to the force and frequency of central places;

(d) Proportion of the urban to the rural population -- the urban workers give more value to the consumption of central goods than the rural ones do;

(e) The population's level of education and culture -- raises the demand for more specialized and sophisticated goods; and

(f) Transportation system -- the better the conditions and the smaller the expenses with transportation, the bigger the central places' propensity to grow.

In addition, it is also important to consider the necessary minimum scale (or "critical limit" or "limit of demand") to produce any goods. In other words, the greater the specialization of some goods or services, the bigger the minimum scale that justifies, in economic terms, its offer in a certain location, which will determine a central place. This relates to the "scope of goods", which is directly related to the size of a central place and is associated with the maximum

distance the consumer is willing to cover to obtain a certain kind of product or service offered in that centre. The scope is determined by characteristics such as size and importance of the location; spatial distribution of the population; amount the consumer is willing to spend on the goods; subjective economic distance; type, quantity and price of the goods offered in the place. The economic distance is determined by the cost of the freight, insurance and storage, time and loss of weight in transit. As to the transportation of passengers, it is determined by the cost of transportation, the time required and the discomfort of the journey.

Crocco, Calvante and Castro (2006) studied the role of the financial system (money) and liquidity preferences in the construction of a region's centrality and concluded that a certain area's centrality works as an important incentive to banks' location decision. They observed that banks with smaller liquidity preference tend to offer more credit, facilitating the growth of the region where they are immersed. Or, the other way round, banks will be centralised in areas where there is abundance companies hunger for liquidity or financial needs. The authors concluded that it contributes to reinforce the regional disparity. The greater the centrality of a region will mean the greater the liquidity preference in its surrounding. On key insightful ideas from them is that the financial system is not merely playing a passive role to meet the liquidity or financial needs of enterprises, its location also in a way impacting companies who have large liquidity and financial needs to be concentrated around them.

3.2.4 Urban Economic Growth Theory

Jane Jacobs, in her book *La economia de las ciudades*[7], from 1975, reinforces and improves Christäller's idea of centrality, as she emphasises the importance of the diversification of activities for urban growth, through the emergence of externalities. Aiming at understanding why some cities grow while others are stagnated, she developed a theory of urban economic growth. In her studies, the author defends the idea that the city grows through diversification and gradual differentiation of its economy, coming from the initial export activity work and its providers. This is the idea of the city's epigenesis, an analogy made by the author based on the existing debates about historical evolution. Jacobs (1975) develops the notion of two synchronised systems of reciprocity. The first is related to the generation of exports and the second to the substitution of imports. In the absence of one of them, the whole system fails and the city becomes stagnated. According to the first system, when a city's exports risen, the local economy also grows. The progress of the local economy is possible because the growing exports generate more imports to the city. The process of development of the urban economy continues if the cities, as they grow, substitute import through their internal production, liberating resources to import other things. Thus, the second system of reciprocity begins, more complete than the first one: a city begins to produce its imports, being able to substitute many of them. By doing this, it is capable of generating more exports, and so forth. The whole process generates the expansion of the city's total economic activity, being considered the main cause of its economic growth.

[7] This book was translated from *The Economy of Cities* published in 1969.

3.2.5 Economies of Scale (Internal and External)

The classical economies of scale theory, both internally and externally, can also be used to explain the formation of financial centres. The internal economies of scale theory states that the cost of production could be reduced and hence profit is maximized if a financial institution concentrates the provision of financial services from a single large establishment in a city than from several smaller establishments in various cities within the same area. The advantages from external economies in the formation a financial centre are perhaps even more obvious. Many of the external economies could be simply related to improvement in information flows – and hence more accurate and competitive pricing of financial services and instruments. For example, financial institutions may gain from higher liquidity by joining each other in organized markets. In addition, financial institutions do benefit from close business contacts with each other. Not only may financial institutions form closer business relationships with each other should their establishments be in the same city, a group of trades and professionals is more likely to grow around such a group of financial institutions to provide professional services such as accounting, legal consultancy, computer programming, research.

Rosenthal and Strange (2001), being in line with the Central Pole Theory and seeking the microeconomic foundations of agglomeration, emphasized three elements: knowledge spillovers, labour market pooling, and input sharing. In other words, they have implicitly assumed the ability of financial centres to provide an environment where: (1) economic agents can meet and communicate

easily (knowledge spillovers); (2) labour moves unencumbered within an urban area (labour market pooling); and (3) public infrastructure is adequately provided and goods are efficiently transported (input sharing).

The evidence that financial centres look for improvement in innovation, social change, and economic growth is very strong. In addition, it is believed that financial centres facilitates interaction and the concentration of talent, which does help a lot in innovation and technological progress.

3.2.6 Information

In terms of the analytic framework, the concentration of financial activity is compliant with the institutional features of the country and the region where the concentration is located. For example, in the case of stock markets, the heterogeneity of the institutional environment of financial centres across space has serious implications for the attractiveness and competitive position of its respective stock exchange. This is because the firms and investors who want to manifest themselves in such an environment have to adapt to the unique conventions of a country's financial system and institutional environment. Basically, these standards emphasize the importance of information in finance. From an investor's perspective, these standards refer to the possibilities to gather, monitor, and evaluate potential investment projects. Obviously, the evaluation process is highly dependent upon the costs and availability of information about the project targeted for investment. Similarly, listed firms are confronted with the conventions of the financial system and the stock exchange, primarily

regarding the provision of information about the performance and prospects of the firm. Yet, information is, however, subject to a varying degree of imperfections and investor is offered certain return premium based on the risk involved. In general, these imperfections take the form of information asymmetries, which denote the possible discrepancy between the investor and the borrower concerning the information about the risk profile of the investment project. The costs of information disclosure could impose constraints on firms in search of a stock market listing. As these costs are predominantly scale sensitive, it is especially difficult for new and small firms to access funds through a capital market listing. Pursuing a listing on an exchange with relatively high financial reporting standards, for example, forces a firm to comply with a high degree of corporate transparency. For firms with low initial reporting standards, this transformation can become a very costly operation. Nevertheless, the reduction of the monitoring costs for potential shareholders becomes a major benefit. In addition to the level of financial reporting standards, there are two more important standards determined at the country level. First, the legal environment (both legal rules and their enforcement) matters for corporate governance. The foremost subjects are standards of investor protection against the misconduct of managers of listed firms and the general level of bureaucracy. When the standards of investor protection in a country are high and the bureaucracy is relatively efficient, the cost of capital for the company concerned may decrease. Second, it seems evident that firms in search of a listing can reduce transaction costs, especially in terms of communication costs, when listed in a location which is culturally homogeneous to its location of residence. Thus, the relative importance of the nation-state and its institutional features as such can already account for significant differences in

terms of financial centre attractiveness. As a result of this often unique institutional feature, stock exchanges differ in their underlying characteristics as well. The two characteristics which are commonly assigned to be the most important in affecting the listing decisions of firms are market liquidity and size.

A market is said to be liquid when individual transactions cause only minor price reactions. In illiquid markets, even small orders may significantly affect price changes. Risk-averse investors, for example, prefer to trade in liquid markets because the risk of price changes caused by liquidity shocks of individual traders is lower, which can attract more trading volume. Therefore, markets which are relatively liquid can cause a lower cost of capital for the firm (Brennan and Subrahmanyam, 1996). In this sense, liquid markets are, due to scale economies, self-reinforcing and can be found in financial centres with a high number of traders and a bigger size market as discussed in Christäller's Central Place Theory (1966). Besides the number of potential investors, the visibility, reputation, and prestige of the firm can be enhanced when a firm decides to list on a larger, more prominent stock exchange (see Bancel and Mittoo, 2001; Pagano et al, 1998). Reputation and prestige are, in this context, predominantly concerned with the signal a listed firm provides to investors and customers alike about the willingness to subject itself to the scrutiny of outside financial analysts. As a consequence, these market conditions directly influence the competitiveness of the financial centre and, due to their uniqueness and immobility, contribute to establishing comparative advantage.

3.2.7 Self-growing and reinforcing (or Cumulative Causation Theory)

According to cumulative causation theory, cumulative causation refers to a self-reinforcing process during which an impulse to a system triggers further changes in the same direction as the original impulse, thus taking the system further away from its initial position. A financial institution could achieve significant gain from operating business in a financial centre with large critical mass and such gain become self-reinforcing. For example, a financial centre such as London establishing a market in a financial instrument that is bigger than its rivals such as Paris and Frankfurt can, by offering the benefits of liquidity and efficiency, attract business, and secure more scale economies and reputation in a cumulative manner. Financial institutions will continue to be attracted given the large number of financial institutions already there. According to Christäller's Central Place Theory (1966), business will be concentrated in such centres, smaller centres will lose business and new centres will find it difficult to become established. Such a self-reinforcing phenomenon is particularly important when we study the prospect of Shanghai to emerge as an international financial centre given the existence of Tokyo and Hong Kong. Furthermore, the attraction of stock market listings also depends on the characteristics of the financial centre itself. Centres which vary significantly in terms of institutional features, stock market characteristics, and size often attract different sorts of client groups. The firms constituting these client groups can consecutively be categorized according to size, international orientation, and market segmentation. The discussion of these subjects is intimately related to the second part of the analytic framework - namely, the spatial scope of the financial centre. As argued by Clark and O'Connor (1997),

financial products often have a distinct spatial configuration of information embedded in their design. The more transparent a financial production process is, the better the accessibility of the information needed to monitor the product itself and its supplier. Accordingly, as information about the product is generally accessible and ubiquitous, only a few large financial centres around the globe with distinct economies of scale offer these products. In most cases, the same principle holds true for stock markets. As shown by Pagano et al (2002), US exchanges like NASDAQ and the New York Stock Exchange, which offer relatively low trading costs, tight financial reporting standards, and better shareholder protection, attract far more listings, both domestic and foreign, than European exchanges (apart from Frankfurt and, to some extent, London). The attracted listings involve significantly larger firms as well, especially in the case of cross-listed firms. These outcomes imply that exchanges which impose strict rules in terms of information disclosure attract more (international) listings and consequently have a larger spatial scope. That the firms attracted to these internationally oriented financial centres are also quite large is obvious: an international (cross-) listing does not come cheap in terms of transaction costs. In contrast, minor capital markets with lenient rules concerning information disclosure attract relatively smaller firms which are predominantly domestically oriented. Although large international financial centres attract relatively more listings compared with national or local ones, it does not necessarily mean that national financial centres have no possibilities for creating comparative advantage. National centres, which benefit from the advantages of scale economies to a lesser extent, often (re)focus on specific financial instruments like, for example, commodities, foreign exchange, and/or derivatives markets in order to attract specific firms or investors. In addition, specialization is also

possible in specific market segments. For instance, an important source of comparative advantage for stock exchanges can be the centre's hinterland itself because of the non-tradable, implicit forms of localized information (Lo, 2003). In contrast to many large financial centres, the information about listed firms on exchanges with a national focus is often not easily accessible and generally interpretable (i.e. the information is non-standardized). This may result in an increase of information asymmetries due to distance decay effects. In turn, for listed firms within close proximity of the financial centre, this could lead to distinct market advantages as compared with firms which are located in the financial peripheral regions (Klagge and Martin, 2005). Therefore, the market segmentation of a stock exchange may be biased to those real-sector activities present in the immediate hinterland of the financial centre, opening the possibility of sector specialisation. When there is sector specialisation, the attractiveness and comparative advantage of the financial centre increases. It is because firms prefer to list on the same exchange as their peers. Those firms which are not capable of becoming listed on this specialised exchange (due to, for example, high transaction costs), cannot make use of the signalling effect to consumers and investors. In turn, this results in a competitive disadvantage for the firm on the industry level (Stoughton et al, 2001). Accordingly, sector specialization initiates imitation effects for firms in search of a listing, an effect already found by Pagano et al (2001) with reference to cross-listings. For countries with spatially decentralized capital markets, like China, this issue seems especially relevant.

To avoid direct competition from existing large world-wide international centres, it has been the China Government’s policy to maintain certain barriers

(e.g. exchange rate control, stringent requirement for domestic companies to list their shares aboard) to protect the development of the Shanghai financial market.

In addition, Isard (1956) argues that given the cost to relocate a firm, it is important to also consider the advantages in already existing production points. Hoover (1971) adds that the location choice represents a long-term commitment, given the costs associated with any change. This commitment is done under uncertainty regarding the benefits involved in the location and especially the possible changes in the relative advantages. Associated to the monetary costs of relocation, such uncertainties introduce a strong element of inertia, called industrial or geographical inertia by Dicken and Lloyd (1990). Once established in a place, the physical capital is transformed in a powerful location force, which leads the development of the economic space and such factor tends to reinforce the centrality of a specific place.

3.2.8 Regulation and Prudential Supervision

Regulation and supervision is a two-edged sword to the development of a financial centre. On one hand, it is important that the host government should provide a reasonably hospitable environment with ideally no discrimination of any kind against foreign financial institutions, yet on the other hand, a too tight or strict supervision in the financial sector could lead to additional operational costs to the financial institutions.

A strict prudential supervision, which conforms to international standards for investor protection, gives international investors and multinational companies' confidence to perform financial activities. However, economists have long pointed out that regulation itself no doubt added extra *costs* to the economy. For example, the guidelines issued by the Basel Committee which lay out the framework of banking supervision that is particularly important in managing and controlling risk, such as credit risk, liquidity risk, market risk, interest rate risk, of a bank, to enhance the stability of the banking industry has inevitably raised the cost of production. In fact, banks have always been complaining that they have incurred additional costs to keep up with the requirements, such as capital requirements, liquidity requirements, and credit risk control requirement, set out by the Basel Committee and their regulatory authorities. For those who are against more regulations in the financial markets raised that: (1) free market outperform regulated market. This is based on the theorem of welfare economics which advocates competitive equilibrium as an optimal Pareto efficient equilibrium where marginal revenue equals marginal costs; (2)

regulation is inefficient as it increases agency costs. Jensen and Meckling (1976) commented that in an unregulated economy, management will voluntarily agree to supply shareholders with financial information to aid monitoring, because they can do so at a lower cost and also it provides evidence of contractual undertaking not to transfer wealth as this will have impact on the reputation; (3) regulation of innovations in financial products and services can result in social costs; (4) regulatory capture occurs as public or private groups manipulate regulations for their own interests; (5) experts should self-regulating themselves as ethics is more efficient and effective than regulation. Yet, for those who support regulations claimed that regulations are required because the captioned arguments do not consider how unregulated or poorly regulated markets could raise systemic risk level. In addition, the arguments are based on the Efficient Market Hypothesis and Agency Theory. If either theory doesn't hold, regulation will be needed to ensure that financial institutions can perform effectively in situation of asymmetric information.

3.2.9 Resources Based View (RBV)

Resources Based View provides another view to analyse the development of a place into an international financial centre from the resources perspective. RBV looks at economic units in terms of their resource endowments. Although RBV is more used to analyse a firm, the same framework can be used to analyse a city. For a firm, in general, the resources that we assess include all assets, capabilities, organisational processes, firm attributes, information, knowledge that are controlled by a firm, as well as any other resources (tangible

or intangible) which enable it to conceive of and implement strategies that improve its efficiency and effectiveness as well as to create value added production. Barney (1991) pointed out that: resources are distributed heterogeneously across firms and productive resource cannot be transferred from firm to firm without cost. Hence, Barney (1991) further elaborated that when certain resources are not imitable (i.e., they cannot easily be replicated by competitors), not substitutable (i.e., other resources cannot fulfil the same function), and not transferable (i.e., they cannot be purchased in resource markets), these resources may produce a competitive advantage that is long lived (sustainable). Hence, based on this, the key is, if a firm would like to gain competitive advantages, one should identify types of resources that lead to high profits, not substitutable, and not transferable. To achieve this, one will need to strike a balance between the exploitation of existing resources, the development of new ones, purchase a bundle of resources in a highly imperfect market, and resist duplication by competitors.

In the context of development of international financial centre, a city will need to gain competitive advantage over the others. Hence, the key is also to identify and acquire attributes (or resources) that may lead to high competitive advantage. Ideally, the attributes or resources should be not substitutable and not transferable. In addition, one will need to strike a balance between the exploitation of existing resources, the development of new ones, purchase a bundle of resources in a highly imperfect market, and resist duplication by competitors. Capability of a city to employ appropriate resources is also very important. In some cases, capability could refer to the governance as well as the effectiveness and efficiency of the decision-maker in a place.

3.2.10 Additional studies on the development of international financial centre

Huat, Lim and Chen (2004) highlighted in their comparative studies of the development of Hong Kong and Singapore as international financial centres that the two places have gone through a two different processes which is a result of different philosophies. While Singapore developed itself as an international financial centre mainly through active government policies, which has been successful in creating and maintaining Singapore's niche in the international financial market by adaptive maintenance of internationally competitive tax structures and constant provision of a sound and stable financial system, the Hong Kong government adopts a policy of non-intervention and laissez-faire that encourages entrepreneurial inflow. Yet, one common policy that both governments shared is the tight regulation and corporate governance which are key elements to contributing to their status as international financial centres. This also supplements the previously discussed section on regulation and prudential supervision (Section 3.2.8).

Fakiyesi (2009) presented at the 50th Anniversary of Central Bank of Nigeria that there are several pre-requisites in relation to the development of an international financial centre: (1) Formulating specific policies to promote the efficient functioning of the financial system; (2) Maintaining an appropriate economic and legal environment for an open, fair and efficient market so as to enhance the international competitiveness and to attract foreign investments; (3) Developing payment, clearing and settlement systems to facilitate the safe and efficient conduct of international and cross-border financial activities; and (4)

Strengthening corporate governance standards to foster international confidence in the financial markets.

Pakhomov (2011) pointed out that the pre-condition for development a place into an international financial centre include a sound financial system which consisted of a liquid market and absence of man-made barriers between various market segments and absence of protection barriers and discrimination of foreign market participants (hence, therefore promoting wide presence of international financial companies); adequate financial governance and control; high quality "human capital" in financial field; advanced telecommunications; modern and constantly developing IT infrastructure which is capable of meeting growing demands of global financial companies, requirements of trading platforms etc.; and a dynamically developing national (regional) economy which generate large demand for financial services.

In summary, these academic literatures provide us additional insight on what could be key successful factors or conditions for the development of international financial centres.

3.3 Ranking or Rating of International Financial Centre

While it is not the objective of this research to come up with an index to rank various international financial centres, it would be insightful to review some of the existing attempts made by various institutes to rank various international financial centres.

3.3.1 World Competiveness Ranking by IMD International Ltd.

Developing an index to measure and study a city's performance as an international financial centre stemmed from the 1980s when the Swiss-based organization, IMD International Ltd. ("IMD"), took into account the finance competiveness of a country into the world ranking of the overall competiveness of a nation despite it is more for assessing a country than a city. IMD's definition of competitiveness is: "How nations and businesses are managing the totality of their competencies to achieve greater prosperity". IMD ranks and analyses the ability of nations to create and maintain an environment in which enterprises can compete, based on an implicit assumption that wealth creation takes place primarily at enterprise level where the "enterprises" operate in a national environment which enhances or hinders their ability to compete domestically or internationally. The methodology of the world competitiveness ranking ("WCR") thus divides the national environment into four main factors: (1) Economic Performance; (2) Government Efficiency; (3) Business Efficiency; and (4) Infrastructure. In turn, each of these factors is divided into 5 sub-factors which highlight every facet of the areas analysed. Altogether, the WCR features 20 such sub-factors: (1) under Economic Performance: - Domestic Economy, International Trade, International Investment, Employment, and Prices; (2) under Government Efficiency – Public Finance, Fiscal Policy, Institutional Framework, Business Legislation, and Societal Framework; (3) under Business Efficiency – Productivity, Labour Market, Finance, Management Practices, and Attitudes and Values; and (4) under infrastructure – Basic

Infrastructure, Technological Infrastructure, Scientific Infrastructure, Health and Environment, and Education.

Each sub-factor is assumed to have the same weight in the overall consolidation of results, i.e. 5% (20x5 =100). Criteria can be hard data, which analyse competitiveness as it can be measured (e.g. GDP) or soft data, which analyse competitiveness as it can be perceived (e.g. Availability of competent managers). Hard criteria represent a weight of 2/3 in the overall ranking whereas the survey data represent a weight of 1/3. The overall ranking is computed by aggregating the results of the 20 sub-factors which makes the total consolidation. As the competitiveness considered by IMD is not just about growth or economic performance but should also take into consideration the "soft factors" of competitiveness, such as the environment, quality of life, technology, knowledge, this helps explain why some countries, the US, Japan, the UK, Nordic economies and small, open economies like Hong Kong, Singapore and Switzerland are able to maintain their rankings in the top league despite short-term disruptions in the financial and banking sector.

(1) While the IMD ranking provides good indicators to measure the competitiveness of nations, it has various limitations serving as reference to our research : (1) it measures the competitiveness of nations but not cities; (2) the factors and sub-factors in the study are not specific for the competitiveness of financial centres but for the general economic development of nations; (3) the factors or sub-factors are not built specifically for identifying the key attributes which contribute to the

development of an international financial centre; (4) IMD ranking is not a forward looking index and it doesn't tell anything about the perceived or anticipated future development of a financial centre.

3.3.2 The Global Financial Centres Index (GFCI)

The City of London started assign Z/Yen Group in 2003 to assess the competitiveness of London, New York, Paris, and Frankfurt as a global financial centre. The first Global Financial Centres Index (GFCI) was produced by the Z/Yen Group for the City of London in March 2007. It rated and ranked each major financial centre in the world in terms of competitiveness. Since then, the increase in the number of respondents and additional data in successive editions has highlighted the changing priorities and concerns of financial services professionals. The Z/Yen Group publishes the index on a frequency of half-yearly since 2007 and the number of cities covered in the studies has been increased to 75 as of September 2009 (remain the same number 75 as of 31 March 2011). The index is computed by combining instrumental factors (external indices) with assessments of financial centres from responses to an online questionnaire. Instrumental factors are grouped into five overarching areas of competitiveness – People, Business Environment, Infrastructure, Market Access and General Competitiveness. Objective evidence of these areas of competitiveness is provided by a variety of comparable sources. For example, evidence about the infrastructure competitiveness of a financial centre is drawn from a survey of property and an index of occupancy costs. Evidence about a fair and just business environment is drawn from a corruption perception index

and an opacity index. As of March 2011, there are 76 instrumental factors used in the model. The Z/Yen Group explained that the 76 instrumental factors were selected because the features they measure contribute in various ways to the fourteen competitiveness factors. Besides, Z/Yen will continue keep updating these factors. Without further explanation and clarification regarding the sources of these fourteen competitiveness factors, the Z/Yen Group displayed them and the ranking of relative importance as shown in Table 3.1.

Table 3.1: Competitiveness Factors and their relative importance

Competitiveness Factors	Rank
The availability of skilled personnel	1
The regulatory environment	2
Access to international financial markets	3
The availability of business infrastructure	4
Access to customers	5
A fair and just business environment	6
Government responsiveness	7
The corporate tax regime	8
Operational costs	9
Access to suppliers of professional services	10
Quality of life	11
Culture & language	12
Quality/availability of commercial property	13
The personal tax regime	14

During the 9 semi-annual published indices since 2007, factors have been undergoing continuing updating, replacements, exchanges, the methodology and

mechanism lacks transparency. For example, the Z/Yen Group did not justify the reasons and ways they derived the factors and also the rationale behind determining the relative importance.

Nevertheless, Table 3.2 shows the top 20 global financial centres ranked by the Z/Yen Group for the two six-months ended in March 2011 and September 2010 respectively:

Table 3.2 Top 20 Global Financial Centres ranked by Z/Yen Group

GFC Ranking	March 2011	September 2010
London	1	1
New York	2	2
Hong Kong	3	3
Singapore	4	4
Shanghai	5	6
Tokyo	5	5
Chicago	7	7
Zurich	8	6
Geneva	9	9
Sydney	10	10
Toronto	10	12
Boston	12	13
San Francisco	13	14
Frankfurt	14	11
Shenzhen	15	14
Seoul	16	24
Beijing	17	16
Washington DC	17	17
Taipei	19	19
Paris	20	19

GFCI provides a good framework to measure the competitiveness of various global financial centres in the world. However, its methodology and measurements are subject to various drawbacks and limitations:

(1) Some indicators used in GFCI's instrumental factors are not applicable to cities in China where equivalent or comparable data cannot be found;

(2) GFCI didn't explain the connection between economic theories and the selection of the instrumental variables and indicators;

(3) There is lack of control regarding responses to the on-line questionnaires. Almost anyone who has access to the internet, regardless of their background, experience, knowledge level, can access the questionnaire on-line and answer the questions. The validity of the responses is hence in doubt.

(4) GFCI only aims at measuring the competitiveness of global financial centre and it does not focus on key factors which contribute to the development of a global / international financial centre. GFCI doesn't take into account the historical development and background of each financial centre in its modelling.

Nevertheless, despite the drawbacks and limitations, the establishment of the GFCI illustrates growing interests to develop a representative index to measure the development and performance of a global financial centre.

3.4 Identified Factors from History and Theories

The review of the historical development of Hong Kong and Shanghai has helped provide much useful background on what might have led to the rise and fall of these two places for being financial service hubs. Having reviewed and analysed the historical development of the two places and the relating, academic literature and theories[8], a number of possible key success factors which may be attributable to the development of international financial centres was identified and these possible key success factors are crucial and important in the construction of the questionnaire survey.

In brief, the demand and supply theories (Smith 1776) (Section 3.2.1), the location theories (Thunen 1826, Weber 1969, Losch 1954) (Section 3.2.2), and the analysis of historical development of Hong Kong and Shanghai (Chapter 2) suggested that location and ease of transportation could be important, hence, the three possible key success factors were identified. They are: *the proximity to manufacturing / production site[1], the transportation network[2], and time zone[3]*. In addition, based on the previous work done by IMD and Z/Yen (Section 3.3) in constructing the World Competiveness Ranking and GFCI, the possible key success factors such as *the quality of labour supply[4], and the infrastructure[5];*

[8] Mainly the classic Supply and Demand Theory (Smith 1776) ; Location Theories (Thunen 1826, Weber 1969, Losch 1954)and Central Place Theory (Christaller 1966, Crocco, Calvante and Castro 2006); Urban Economic Growth Theory (Jacob 1975); Economies of scale (Rosenthal and Strange 2001); Information; Self-reinforcing (or Cumulative Causation Theory) (Pagano et al 2002); Regulations and Prudential Supervision; and Resources based view (Barney 1991), World Competiveness Ranking by IMD, the GFCI by Z/Yen Group, etc.

and the legal system, accounting system, corporate governance[8] were highlighted. Furthermore, learned from the historical fall and rise of Hong Kong and Shanghai (Chapter 2), we were aware that *political stability*[6] and *openness to foreigners and markets*[9] could play an important role in the development of these two places. Besides, as we had discussed on the academic literature on regulations and prudential supervision (Section 3.2.8), *regulation and prudential supervision of financial market*[7] could be another important determinant. Huat, Lim and Chen's (2004) (Section 3.2.10) comparative study between Hong Kong and Singapore had highlighted that *government policy and support*[11] could make an apparent difference in the development path of these two places. In addition, inspired from Economies of scale (Rosenthal and Strange 2001) (Section 3.2.5) and the Resources Based View (Barney 1991) (Section 3.2.9), *cost of production*[10] could be an important consideration affecting the competitiveness of a financial centre. Furthermore, the urban economic growth theory (Jacob 1975) and the self-reinforcing or cumulative causation theory (Pagano et al 2002) (Section 3.2.4 and 3.2.7) suggested that certain economic indicators such as *economic growth*[12], *inflation*[13], *and currency stability*[14] could also be relevant in contributing to the development of international finance centres.

Based on the captioned review, in summary, the following possible key success factors are identified and used in the construction of the questionnaire survey.

1. Proximity to manufacturing / production site
2. Transportation network (such as intercity highway, railway, sea-route, etc.)
3. Time zone
4. Quality of labour and labour supply
5. Infrastructure (such as settlement and payment structure, telecommunication, etc.)
6. Political stability
7. Regulation and Prudential Supervision of financial market
8. Legal system, accounting system, corporate governance
9. Openness to foreign markets and investors
10. Cost of production (such as rental expense, wages, etc.)
11. Government policy and support
12. Economic growth
13. Inflation
14. Stability of currency

Chapter 4: Research Methodology

4.1 Research Method

This chapter will review and discuss the research methodology adopted in this study. To recoup, it is our research objectives mentioned in Chapter 1 to:

1. Review and briefly summarise the historical development of Shanghai and Hong Kong as international financial centres.

2. Review major economic theories in relation to the development of a city and possible emergence as an international financial centre.

3. Construct a survey to identify possible factors contributing to the development of Shanghai and Hong Kong as financial centres based on the perception of the finance practitioners.

4. Discuss the future prospects of Shanghai and Hong Kong

To address the captioned research objectives, as a first step, we had started by looking into and summarising the historical development of Hong Kong and Shanghai as international financial centres in Chapter 2. The review of the historical development of the two cities gives us good insights on how these two cities have been progressing till today and what has contributed to their successes in the past. Then, in Chapter 3, we reviewed key literatures on economic development and identify factors that play an important role in the

formation and development of an international financial centre. Literature review refers to the review and evaluation of current and previous concepts, theories, and studies which may be related to the development of Hong Kong and Shanghai as international financial centres. Concepts and theories from existing publications, i.e. literature are reviewed and a set of attributes or factors leading to the development of a financial centre were identified. Literature review is important to understand the current state of knowledge, background to the issues, relevant concepts and theories in relation to the topic. As the research topic consists of both academic theories and current issues and status regarding the development of international financial centre, it is intended that both formal literatures and less formal articles such as academic papers, journals, and textbooks are reviewed to understand the more established academic theories of financial centre development and their current development status. Literature review enables us to establish a conceptual framework to analyse the research topic

To assess how the identified qualitative factors / attributes from our literature review are contributing to the development of Shanghai and Hong Kong as international financial centres, we determined that it could be more appropriate to conduct a qualitative research rather than a quantitative research as we shall aim at exploring whether the identified factors or attributes from theories are shared and agreed by financial practitioners based on their experience in the financial industry. Besides, most of the factors identified, such as geographical location, regulations and supervision, government policies, resources (including labours), economies of scales, accessibility to information, infrastructure, etc., from the literature review and historical development are qualitative in nature.

In order to help assess whether the identified factors or attributes from literature review and historical development were agreeable by finance practitioners in the financial industry, a questionnaire was designed to collect feedback from practitioners in the financial industry. The questionnaire comprised mainly of closed-ended questions instead of open-ended questions so as to avoid and minimise risk of subjective interpretation when coding the open-ended responses before computer analyses. Questions are constructed in a way so as to collect inputs or thoughts from participants regarding the various factors or attributes identified from literature review and historical development that may contribute to Hong Kong and Shanghai as international financial centres. Most of the questions are constructed in ordinal scales where participants are requested to indicate how important certain factor(s) or attribute(s) is / are related to the development of Hong Kong and/or Shanghai as an international financial centre. Questions asked in the questionnaire were devised based on the review of the historical development of Hong Kong and Shanghai (Chapter 2) and the discussion of relevant economic theories and studies related to this topic (Chapter 3). Other than the first question in the questionnaire which include all the identified possible key success factors (please refer to section 3.4) which may attributable to the development of international financial centres for respondents to assign weighting of importance, the rest of the questionnaire (or other questions in the questionnaire) is an elaboration of each factor and respondents were asked to evaluate the performance of Hong Kong and Shanghai with respect to each of them.

Before the questionnaire was confirmed and finalised, the draft was shown to a few practitioners in the banking industry for their comments so as to ensure that the constructed questions are clear, readable, unbiased, relevant, and appropriate. They were satisfied in general with the drafted questionnaire and no significant changes other than minor formatting and typing mistakes were rectified.

There are various common ways to collect feedback from individuals. Some of the more popular ones are (1) focus group; (2) face to face interview; (3) telephone interview. Each of the collection methods and the respective pros and cons are discussed as below.

A focus group is a form of qualitative research where a group of people are arranged to be seated and to talk interactively with other group members regarding their perceptions or opinions towards certain topics. Questions are raised by the facilitator and members in the group are encouraged to talk freely. An advantage of forming a focus group is that it allows the facilitator to observe and study each member in a more natural setting than a one-to-one interview. Yet, the disadvantage of it in relation to our study is that it may not be practical to group the respondents and have their presence in one location easily.

A face-to-face interview is a face to face conversation process between two people (the interviewer and the interviewee) where the interviewer sits with the interviewee, asks questions to the interviewees so as to obtain information from them. The advantage about face-to-face interview is that it allows the interviewers to ask further questions based on the answers provided by the

interviewees so as to clarify and obtain a more clear understanding of the answers. However, a possible shortcoming of this technique in relation to this study is that it is difficult and extremely time-consuming to make appointments and to meet with all the targeted respondents face to face. In addition, geographical distance is also a concern if the interviewer may need to interview respondents who are residing far away geographically.

An alternate way to conduct an interview is through telephone. It is a more convenient and easier way to be implemented as interview can done over the phone even though the two parties (interviewer and interviewee) are located far apart. However, for this study, as most of the respondents are of high corporate rank in an organisation, it is difficult and extremely time consuming to get their consent to set up phone interview sessions with each one of them. Besides, as some respondents may receive lots of requests from media, research companies, etc., for phone interviews and video conferencing, they may not be willing to entertain phone interview request from non-profit making organizations.

At the end, after much consideration on the resources constraint, geographical limitations, and practical difficulties, it is deemed impossible or difficult to reach out and collect views from individuals within a short time frame based on the abovementioned methods. Hence, instead of conducting focus group, face-to-face interviewing, telephone interviewing, etc., we had decided to adopt the traditional mail survey or self-administered questionnaire. We didn't use on-line tools as we considered the responding rate may be lower if respondents are asked to go through the hassle of sitting in front a terminal, log-in, and access the questionnaire on-line.

Questionnaires accompanied by a letter of explanation and a self-addressed stamped envelope for returning the completed questionnaires were sent to the Managing Director / Finance Directors all registered financial institutions with the Hong Kong Exchange & Clearing Co Ltd ("HKEx") and Shanghai Stock Exchange ("SSE") to collect opinions and views from financial practitioners at both places. It is the intention that, a full population of all financial institutions registered with the HKEx and SSE was included so as to reduce sampling errors. Targeted respondents are supposed to be senior and experienced practitioners in the finance industry and should be competent to answer the questionnaire. At the first round, questionnaires were mailed in February 2005 to 560 financial institutions in Hong Kong (all exchange participants in Hong Kong published by the HKEx) and 387 financial institutions in Shanghai listed in the Directory of Financial Institutions in Shanghai in self-addressed stamped envelopes. As respondents were not required to identify themselves in the questionnaire, in order to enhance the response rate, follow-up mailings were sent in April 2005. Hence, as a result, a total of 1,120 and 774 questionnaires were sent during the period from February – April 2005 and we would rely on an assumption that the same person does not respond twice to the questionnaires. Although there is a possibility that two different industry practitioners in the same institution may responded, it is acceptable and it won't impact the validity of the study because it was the practitioners or individuals that we were targeting for. The responses represented views from individuals instead of views from institutions. Nevertheless, we are mindful that the results are still subject to bias as only limited financial practitioners are contacted and also the view of them may not represent all individuals in the world. At the end, a total of 376 completed

questionnaires were returned. Of these, 196 were from Hong Kong and 180 were from Shanghai, which represent a response rate of 17.5% and 23.3% respectively.

4.2 Data Analysis Approach

Data collected by the respondents are analysed on a two-level approach. At the first level, observations are first analysed based on the descriptive univariate data analysis. Responding data is counted and certain basic central tendency measurements (mean, median) and dispersion measurements (standard deviation) are computed with the use of the statistical software SAS. Bar charts are constructed to highlight some of the more apparent observations from the data.

On the second level, in order to obtain more insight from respondents' for each question, more sophisticated multivariate data analysis is used to analyse the data. There are numerous multivariate statistical analyses in the market. A few more prominent ones are: (1) Regression Analysis, (2) Discriminant Analysis, (3) Canonical Correlation Analysis, and (4) Principal Component Analysis:

4.2.1 Regression Analysis

While the spirit of regression analysis is to estimate or predict the scores of one dependent variable from one or more independent variables, it can also be used

to determine the minimum number of a set of independent variables which is most strongly related to the dependent variable and also to estimate the percentage of variance in the dependent variable explained by those independent variables. However, a fundamental problem of regression analysis is that one should need to have a pretty clear idea of the independent variables used in the regression analysis. If independent variables used are highly correlated, the issue of multicollinearity could occur and it may impair the statistical significance of various independent variables.

4.2.2 Discriminant Analysis

Discriminant Analysis is a multivariate analysis which is more used for classifying certain observations into various categories. It will be more useful if instead we already have a list of cities who have been classified as "Successful International Financial Centre" and "Unsuccessful International Financial Centres" and we have already had a definite sets of attributes which make an successful international financial centre, then we use this Discriminant Analysis to group Hong Kong and Shanghai into either one of the category (successful international financial centre or "unsuccessful international financial centre") based on the pre-determined attributes.

4.2.3 Canonical Correlation Analysis

The objective of the canonical analysis is more to describe the structure of correlation between two sets of variables. Based on the correlations among the

variables, then canonical correlation analysis will help find linear combinations of the two sets of variables which have maximum correlation with each other. This analysis is less relevant to our study.

4.2.4 Principal Component Analysis

Principal Component Analysis is a multivariate technique for examining relationships among several quantitative variables. Principal Component Analysis was originated by Pearson (1901) and later developed by Hotelling (1933). Principal component analysis is appropriate when we have obtained measures on a number of observed variables and wish to develop a smaller number of artificial variables (called principal components) that will account for most of the variance in the observed variables. Principal component analysis is also a variable reduction procedure, which is particularly useful to reduce the number of variables from a large number of variables as there could be some redundancy in those variables. From a statistical perspective, redundancy could mean that some of the variables are correlated with one another, possibly because they are measuring the same construct. Because of this redundancy, it should be possible to reduce the observed variables into a smaller number of principal components (artificial variables) that will account for most of the variance in the observed variables. Technically, a principal component can be defined as a linear combination of optimally-weighted observed variables. In the course of performing a principal component analysis, it is possible to calculate a score for each subject on a given principal component. The general

form for the formula to compute scores on the first component extracted (created) in a principal component analysis:

$F_1 = b_{11}(X_1) + b_{12}(X_2) + \ldots b_{1p}(X_p)$

where

F_1 = the subject's score on principal component 1 (the first component extracted)

b_{1p} = the regression coefficient (or weight) for observed variable p, as used in creating principal component 1

X_p = the subject's score on observed variable p.

Given a data set with p numeric variables, p principal components are computed. Each principal component is a linear combination of the original variables, with coefficients equal to the eigenvactors of the correlation or covariance matrix.

The weights produced by these eigenequations are optimal weights in the sense that, for a given set of data, no other set of weights could produce a set of components that are more successful in accounting for variance in the observed variables. The weights are created so as to satisfy a principal of least squares similar (but not identical) to the principal of least squares used in multiple regression. Although, strictly speaking, the number of components extracted in a principal component analysis is equal to the number of observed variables being analysed, in most analyses, only the first few components account for meaningful amounts of variance, so only these first few components are retained, interpreted, and used in subsequent analyses. The principal components are

sorted by descending order of the eigenvalues, which are equal to the variance of the components.

As the first component extracted in a principal component analysis accounts for a maximum amount of total variance in the observed variables, it means that the first component will be correlated with most of the observed variables. The second component extracted will have two important characteristics. First, this component will account for a maximal amount of variance in the data set that was not accounted for by the first component. This means that the second component will be correlated with some of the observed variables that did not display strong correlations with the first component. In statistics terminology, the second characteristic of the second component is that it will be *uncorrelated* with the first component. In other words, if one was to compute the correlation between components 1 and 2, the computed correlation would be zero. Similarly, the remaining components that are extracted in the analysis display the same two characteristics: each component accounts for a maximal amount of variance in the observed variables that was not accounted for by the preceding components, and is uncorrelated with all of the preceding components. A principal component analysis proceeds in this fashion, with each new component accounting for progressively smaller and smaller amounts of variance (this is why only the first few components are usually retained and interpreted). When the analysis is complete, the resulting components will display varying degrees of correlation with the observed variables, but are completely uncorrelated with one another. Although sometimes Principal Component Analysis may be confused with Factor Analysis, they are not the same, even though there are many similarities between the two procedures. For example, both techniques

can be used to identify groups of observed variables that tend to hang together empirically, and sometimes, both analyses provide very similar results. One of the key conceptual differences between Principal Component Analysis and Factor Analysis is that Factor Analysis assumes that the co-variation in the observed variables is due to the presence of one or more factors that exert causal influence on these observed variables while in contrast principal component analysis makes no assumption about an underlying causal model. Principal component analysis is a variable reduction procedure that (typically) results in a relatively small number of components that account for most of the variance in a set of observed variables. While both Factor Analysis and Principal Component Analysis have important roles to play in the research, we adopted Principal Component Analysis in this paper.

4.3 Potential Limitations

First, as the questionnaire survey was done in 2005, some may question the validity of market practitioners' perception, especially after the financial crisis in 2008. As the study aims at collecting views, which is more long term in nature, about the critical factors contributing to the development of financial centre, such perception not likely to be changed within a short period of time. Also, the impact of the financial crisis in 2008 has less impact on Asia than the West. Plummer (2009) explained that as many Asian countries have already learned a good lesson in the Asian financial crisis. During the earlier Asian financial crisis in 1997-98, many Asian countries have already rectified most of the weakness in their finance and regulatory policies, and hence, many Asian

countries are in much better position to weather the crisis in 2008. Most Asian banks, in particular, did not participate much on the high risky behaviours of the banks in the West (particularly in United States) such as heavy purchases of mortgage-backed securities, credit-default swaps, and other toxic securities, etc., hence, Asia is least affected by the global financial crisis in 2008.

Evidenced by the market performance (refer to Table 4.1 and 4.2), the financial crises only caused mild fluctuation to the financial markets in Asia. The stock market of Hong Kong (Hang Seng Index) rebounded quickly to 21,497 at the end of 2009, which is even higher than the level (19,353 points) before the collapse of Lehman Brothers on Sept 15, 2008. Similarly, the Shanghai Composite Index also rebounded sharply to 3,277 points at the end of 2009, which is much higher than the level (2,079 points) before the crisis. For national income (refer to Table 4.2), the reported figure for Hong Kong in 2010 has already recovered and even exceeded that in 2007 and 2008. For Shanghai, no apparent adverse impact is noted on its steady growth of national income from 2007 - 2010.

Table 4.1 Stock Index in Hong Kong and Shanghai

	Hang Seng Index	Shanghai Composite Index
12 Sept 2008[9]	19,353	2,079.673
End of 2008	14,387	1,820.805
End of 2009	21,497	3,277.139
End of 2010	23,035	2,852.648
End of 2011	18,434	2,173,561

Source: Bloomberg website: http://www.bloomberg.com/

Table 4.2 National Income of Hong Kong and Shanghai

Year	GDP (HK) (HK$' million)	GNP (China) (RMB' billion)
2007	1,615,574	26,641
2008	1,677,011	31,528
2009	1,622,322	34,140
2010	1,743,858	40,326

Source: "Hong Kong Annual Digest of Statistics 2011" published by the Census and Statistics Department HKSAR;

Source: "China Statistics Yearbook 2011" by National Bureau of Statistics of China

Chhibber, A, Ghosh, J and Palanivel (2009) also explained that Asia, unlike many other regions of the world, the crisis did not cause an overall decline in GDP and a very negative sentiment but more a deceleration of growth.

[9] Last trading day before the collapse of Lehman Brothers

Chhibber, A, Ghosh, J and Palanivel (2009) also pointed out that the subsequent "recovery" is seen to be faster and more pronounced in Asia as Asia is only cyclically tied to the developed world but its long term growth rates are much higher. Based on these, we believe that the financial crisis in 2008 only have a comparatively minor impact on Hong Kong and Shanghai and we do not anticipated that the financial crisis had caused significant change of market sentiment as well as perception, which is supposed to be of longer term, of finance practitioners, we opine the research result, to a large extent, should remain valid.

Second, as discussed before, one key aspect of this research is to collect and analyse the necessary qualitative data (views and perceptions) and compare against what is predicted by the existing theories. As most data are not directly observable and need to be collected from knowledge and perception of human beings, we should be aware of possible limitations inherited in the data source. Ethridge (1995) commented that there are six primary means to acquire knowledge and perception: (1) Senses – a person may have a strong belief or idea on something which is based on his/her own feeling and intuition. Hence, there may or may not be consensus among financial practitioners on how things happen or why things happen. Perception through senses differs among individuals and sensory information may not always be capable of being demonstrated; (2) Experience - similar to senses, knowledge and perception gained through experience may or may not be reliable depending on its nature. Knowledge acquired from experience is essentially private until measures are taken to make it public; (3) Intuition – it can be viewed as knowledge in a vague form. Similar to senses and experience, it is inherently private knowledge only.

An intuitive understanding of fact, relationship, or set of relationships, may in fact lead to an orderly exploration and logical development, which may lead, in turn to public knowledge. While intuition could be a necessary condition for successful research, it is not a sufficient condition for knowledge; (4) Revaluation – it is not uncommon for respondents in a survey answer questions or provide their input based on certain knowledge that they learned from some unknown sources such as reading, discussion with others. We shall be aware that responses derived from revaluation of knowledge from an unknown and unreliable source could also be unreliable. There is a Chinese proverb which says an untrue fact will be seen as truth after it has been circulated and repeated many times among a group of people; (5) Measurement – it is often hard if not impossible to "measure" the importance of various attributes contributing to the development of an international financial centre. It is perhaps one of the most common difficulties in researching in economics where many economic issues are not quantifiable and measureable. Even if some are measureable, knowledge from measurement is still subject to the limitation of potential measurement errors (including sample error); and (6) Reasoning – being deductive[10] or inductive[11], or both, is the way we establish relationships, patterns, concepts, and basic theories through which we can make facts or data mean something that has relevance in the real world. While it is our research objective to establish relationships among several factors or variables, we shall be mindful that it requires a continuing testifying process and most of the

[10] Deductive logic is the process of reasoning from certain assumptions to specific results or conclusions.

[11] Inductive logic is the process of reasoning from the specific circumstances or outcomes to a conclusion about general circumstance or outcomes.

qualitative information we can obtain from financial practitioners is not highly ascertained from reasoning.

Third, it is important for us to realize that the reliability of knowledge from financial practitioners is an important element in determining the reliability of the qualitative data. Johnson (1986) categorized knowledge as (1) positivistic knowledge, and (2) prescriptive knowledge. Positivistic knowledge is knowledge of conditions, situations, or things that are directly observable or measurable. Prescriptive knowledge is normative or partially normative. Prescriptive knowledge is knowledge of what ought to be done and is inherently subjective and we understand that most of the qualitative data or information we obtained from the financial practitioners is from prescriptive knowledge in nature. We are also aware of various kinds of logical fallacies which may affect the reliability of data, and hence, our research results:

(1) First, a logical fallacy may occur when a person only uses information that supports a pre-determined position or conclusion – sometimes the respondents to a survey have already formed a conclusion, hence, they may selectively provide answers which support their pre-determined conclusion(s);

(2) Second, a logical fallacy may occur when conclusions are based on premises without examining the validity of the premises. For example, a respondent may comment that Hong Kong's future as an international financial centre will continue to outperform that of Shanghai based on the premise that Hong Kong has (will have) a better legal and regulatory system. It is a personal or private "belief" or "knowledge" that Hong Kong has (and will have) a better legal and

regulatory system. This premise is not attested and it may change the result of the prediction should it be untrue.

(3) Third, a logical fallacy may occur when one rejects a position or conclusion because of attitudes about the person or group presenting the position or conclusion. For example, some respondents who hold a strong anti-government attitude may actually reject or do not believe a position the government may announce. For example, in the assessment of economic performance, when the government announces a GDP growth of 8%, some respondents may personally or privately decide to adjust the announced GDP growth rate downward by half due to his / her personal distrust with the government.

(4) Fourth, a logical fallacy may occur when it involves accepting or rejecting a position or conclusion because a large number of people accept or reject it. For example, when it is widely reported or said by many people that a good language skill in the workplace is a key or "must" to the development of an international financial centre, one may believe it and say the same. When one is then asked whether Tokyo is a successful international financial centre, the person will say yes even though language skill was not seen key to its development of being an international financial centre.

(5) Fifth, a logical fallacy may occur by one automatically accepting a position, proposition, or conclusion because its source has specialized or in-depth knowledge of it. It may take the form of "statement A is true because individual (or group) X says it is true"

(6) Sixth, a logical fallacy arises when one attribute a wrong cause to an effect. It is common for a person to form a perception that "because event B occurs after event A, hence, A causes B". When it is not only one of the very important fallacies in statistical inference, it also impairs the reliability of qualitative data input. For example, a respondent may point out that the economic development of Hong Kong as an international financial centre surpassed Shanghai after British took over Hong Kong from China, and hence, the British governance is superior to Chinese governance in developing a city into an international financial centre.

(7) Seventh, a logical fallacy arises because of the belief that "A is similar to B, so what is true for A is also true for B". A common application of this fallacious reasoning is that because certain government policies are effective, they also would be effective in China. For example, one may say that minimised government intervention works well in United States in developing New York into an international financial centre, one may then apply the same logic to say that government intervention is always bad for the development of an international financial centre.

(8) Eighth, a logical fallacy may occur when there is reasoning that what is true for a part is automatically true for the whole. One well known economic example of this is "since an individual farmer cannot affect the price of wheat, all wheat farmers collectively cannot affect the price of wheat". In this project, one may say that a low tax environment is good for the development of an international financial centre. Hence, based on the same logic, one may argue

that a zero-tax environment is the best environment for a financial centre development.

Chapter 5: Survey Findings

As described in previous chapter, to analyse and compare the keys factor contributing to Hong Kong and Shanghai in becoming international financial centres, a survey was carried out between February and April 2005. While people in different walks of life could have different opinions or views on the what the important attributes leading to the successful development of international financial centre is / are, it is intended in this research survey to collect the views from a sample of financial practitioners in the financial industry of Hong Kong and Shanghai as it is believed that they are more familiar to the financial market of the two places and their understandings can better represent how the opinion of people in the financial industry on this issue. The questionnaire[12] consisted of nine key questions. In this chapter, we shall aim at summarising and analysing the findings from the survey results. Outputs from SAS are tabulated and discussed as appropriate. The survey questionnaire is shown in Appendix A.

[12] The questionnaires were mailed to 560 financial institutions in Hong Kong (all exchange participants in Hong Kong published by the Hong Kong Exchange & Clearing Co Ltd.) and 387 financial institutions in Shanghai listed in the Directory of Financial Institutions in Shanghai in self-addressed stamped envelopes. To increase the number of responds, the questionnaires are sent twice to each financial institution during the period from February to April 2005. Hence, a total of 1,120 and 774 questionnaires were sent to financial practitioners in Hong Kong and Shanghai respectively during the period. A total of 376 completed questionnaires were received. Of these, 196 were from Hong Kong and 180 were from Shanghai, which represent a responding rate was 17.5% and 23.3% respectively.

5.1 Data Analysis

5.1.1 Question 1 – Criteria or Factors of International Financial Centre Development

Respondents are requested to weigh the importance of various factors as criteria for a city to develop itself as an international financial centre. The result is coded in the order from "1" to "5" with "5" being the most important and "1" being the least important or totally irrelevant. Respondents' replies are tabulated in Figure 5.1a and the mean and standard deviation are computed and shown in Figure 5.1b.

Figure 5.1a: Summary of respondents' replies for Question 1 – Importance of Factors

	Degree of Importance					
	Very ("5")	Quite ("4")	Sometimes ("3")	Not ("2")	Irrelevant ("1")	Total
Proximity to Manufacturing / Production site	31	86	122	95	42	376
Transportation Network	99	166	78	28	5	376
Time Zone	2	78	148	116	32	376
Quality of Labour / Labour Supply	208	134	17	15	2	376
Infrastructure	266	68	37	4	1	376
Political Stability	294	47	30	4	1	376
Regulation and Prudential Supervision	282	45	27	20	2	376
Legal System, accounting system, and corporate gov ernance	224	129	18	4	1	376
Openness	224	117	30	3	2	376
Cost of production	30	105	176	63	2	376
Government policy and support	132	131	107	4	2	376
Economic Growth	31	220	119	4	2	376
Inflation	31	130	140	72	3	376
Stability of currency	151	134	70	19	2	376

Figure 5.1b: General Descriptive Data Analysis – Question 1

Analysis 1-1 – Mean and Variance (full population)

Variable	N	Mean	Std Dev
Proximity to Manufacturing	376	2.9175532	1.1200526
Transportation Network	376	3.8670213	0.9343105
Time Zone	376	2.7393617	0.9010475
Labour supply & quality	376	4.4122340	0.7985048
Infrastructure	376	4.5797872	0.7332237
Political Stability	376	4.6728723	0.6904362
Regulation and Supervision	376	4.5558511	0.8806469
Legal / accounting / governance	376	4.5186170	0.6650708
Market Openness	376	4.4840426	0.7227803
Cost of Production	376	3.2606383	0.8492466
Government Policy & Support	376	4.0292553	0.8527261
Economic Growth	376	3.7287234	0.6456620
Inflation	376	3.3031915	0.8995349
Currency Stability	376	4.0984043	0.9112029

Based on the replies of the respondents (Figure 5.1a), the three factors rated by the respondents as "the very important" are Political Stability, Regulation and Prudential Supervision, and Infrastructure. Yet, as there are also large number of respondents rating legal system, labour supply quality and openness to foreign investments "the very important" factors, if we combine the rating of "very important" and "quite important", we see that 94% ranked legal system, accounting system and corporate governance as very important or quite important while the percentage for labour quality and openness to foreign markets are 90.9% and 90.7% respectively. On the other hand, the two least

important factors are time zone and proximity to production sites, only 21.3% and 31% consider them as very important or quite important respectively. This is well confirmed with higher mean scores as only the six factors scoring a mean score of great than 4.4 (refer to Figure 5.1c):

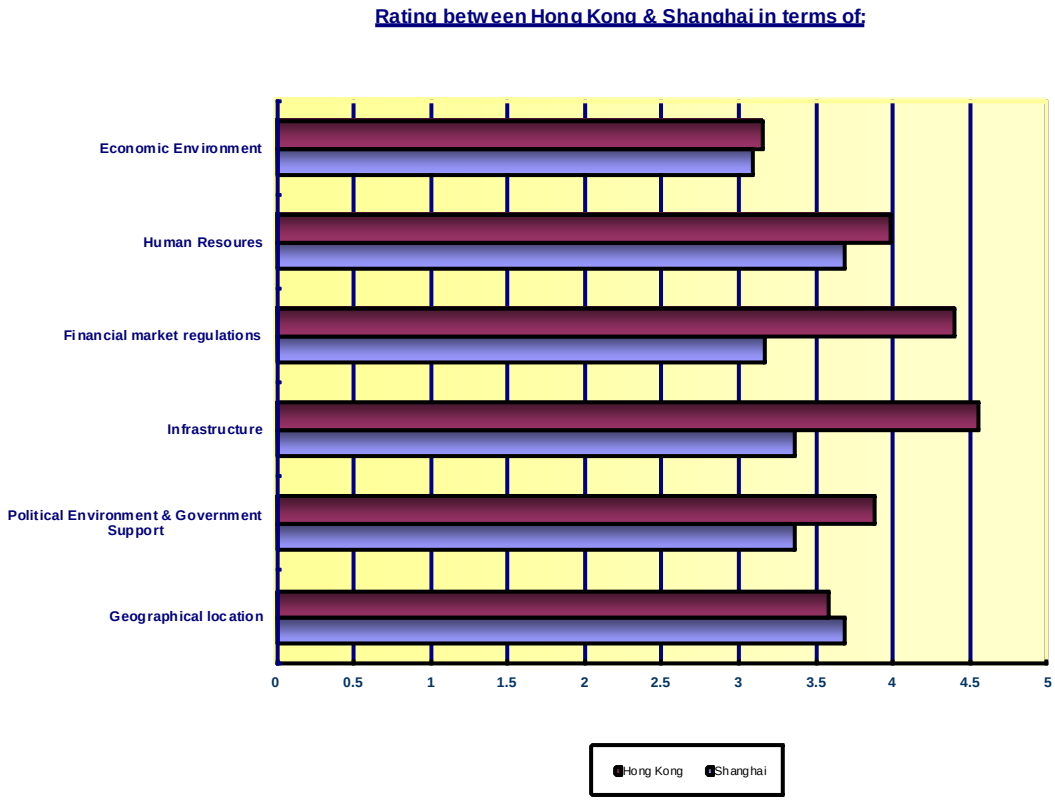
Figure 5.1c Rank of top 6 factors with highest mean scores:

Rank #1	Political Stability	Mean score - 4.67
Rank #2	Infrastructure	Mean score - 4.58
Rank #3	Regulation and Supervision	Mean score - 4.56
Rank #4	Legal / accounting / governance	Mean score - 4.52
Rank #5	Market Openness	Mean score - 4.48
Rank #6	Labour supply & quality	Mean score - 4.41

The importance of time zone and proximity to manufacturing are rated the lowest with mean score of 2.74 and 2.94 respectively.

It is also interesting to compare the mean score between Hong Kong and Shanghai with respect to the factors (Figure 5.1d)

Figure 5.1d Comparison between Hong Kong and Shanghai



From Figure 5.1d, it shows that Hong Kong scores much higher ratings in infrastructure and financial market regulations, with infrastructure scoring over 4.5, more than 1 point higher than their Shanghai counterparts. For other aspects, Hong Kong also scores higher than Shanghai in terms of human resources, economic environment and political environment & government support. On the contrast, according the survey, Shanghai got a higher score in terms of geographical location. To a certain extent, it reflects the general perception of the respondents that Hong Kong has comparative advantage over Shanghai in the areas of infrastructure, financial market regulation, human resources, economic environment and political environment and government support. On the other hand, Shanghai's slight comparative advantage over Hong Kong from

the geographical location probably reflects that Shanghai could be benefited more based on its geographical location being in the centre of China which is the growth engine of the world.

In addition, respondents from Hong Kong and Shanghai provided quite similar responses on the importance of attributes and the correlations are quite highly positive (above 0.7) respectively (See Analysis 1-4, 1-5, 1-6, and 1-7 in Appendix B) It reflects that the perception of respondents from either Hong Kong or Shanghai are quite similar and consistent. This similarity is further evidenced from the comparing the medium of rating for all factors rated by the Hong Kong respondents and Shanghai respondents. Except to proximity to production site where the respondents in Hong Kong gave a median rating of 4 (i.e. quite important) which is in contrast to the median rating of 2 (Not important) given by the Shanghai counterpart, the median ratings given to all other attributes are quite similar between Hong Kong respondents and Shanghai respondents. (See below in Figure 5.1e)

Figure 5.1e Medium rating from Hong Kong respondents and Shanghai respondents (extracted from Analysis 1-8 in Appendix C)

Analysis 1-8

Obs	_NAME_	HK	SH
1	M3	2	3
2	M10	3	3
3	M13	3	3
4	M1	4	2
5	M11	4	4
6	M12	4	4
7	M2	4	4
8	M4	4	5
9	M14	5	4
10	M5	5	5
11	M6	5	5
12	M7	5	5
13	M8	5	5
14	M9	5	5

The eigenvalues computed from the principal component analysis suggested that the first two components may account for 37% of the variance and the rest components account for similar weights. Nevertheless, the first 6 components that has an eigenvalue greater than 1 and accounts for 71% of the various. (See Figure 5.1f which is extracted from Analysis 1-10 in Appendix B)

Figure 5.1f Eigenvalue of Principal Components

Extracted from Analysis 1-10

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.82050331	0.41488887	0.2015	0.2015
2	2.40561444	1.08978464	0.1718	0.3733
3	1.31582980	0.11074724	0.0940	0.4673
4	1.20508255	0.09125033	0.0861	0.5534
5	1.11383222	0.04377239	0.0796	0.6329
6	1.07005984	0.25819327	0.0764	0.7094
7	0.81186657	0.13774761	0.0580	0.7673
8	0.67411895	0.06439620	0.0482	0.8155
9	0.60972276	0.07951255	0.0436	0.8590
10	0.53021021	0.07553491	0.0379	0.8969
11	0.45467529	0.02958585	0.0325	0.9294
12	0.42508945	0.10068664	0.0304	0.9598
13	0.32440280	0.08541099	0.0232	0.9829
14	0.23899182		0.0171	1.0000

In other words, we may focus on the first six components (denoted as Prin1, Prin2, Prin3, Prin4, Prin5, and Prin6 in Analysis 1-10 in Appendix B) generated by the Principal Component Analysis as the key consolidated attributes or factors for the formation of international financial centres. As shown in Analysis 1-10 in Appendix B, Prin1, accounting for 20% of the variance, has heavier weight on A6 (Political stability), A7 (Regulation and Prudential Supervision of financial market), A8 (Legal system, accounting system, corporate governance), A9 (Openness to foreign markets and investors), A11 (Government policy and support), and A12 (Economic Growth). It seems all of them related to policy or infrastructure where government of the place can

play a big role on. Prin2, accounting for 17% of the variance, has heavier weight on A1 (Proximity to manufacturing / production site), A10 (Cost of production), A12 (Economic growth), and A13 (Inflation). I think this component relates more to the production efficient and macro-economic environment. Prin3, accounting for 9.4% of the variance, has heavier weight on A2 (Transportation network (such as intercity highway, railway, sea-route, etc.) and A4 (Quality of labour and labour supply). Prin4, accounting for 8.6% of the variance, has heavier weight on A3 (Time Zone) and A8 (Legal system, accounting system, corporate governance). Prin5, accounting for 8.0% of the variance, has heavier weight on A3 (Time Zone) and A11 (Government policy and support). Prin6, accounting for 7.6% of the variance, has heavier weight on A1 (Time Zone), A4 (Quality of labour and labour supply), A5 (Infrastructure (such as settlement and payment structure, telecommunication, etc.)), and A10 (Cost of production (such as rental expense, wages, etc.)). Nevertheless, we noticed that not only do Prin4, Prin5, and Prin6 accounts for less and less of the variance, they are also replicating and overlapping with Prin1 and Prin2. In other words, if we combine the factors into components based on the Principal Component Analysis, we may focus on two major components, that are: (1) policy or infrastructure where the government of the place can play a big role on; and (2) production efficient and macro-economic environment.

Nevertheless, from the policy makers' perspective, it will be less practical, less structure, and less useful to combine and transform the factors which are more easily to be understood by layman into the components which are hard to be comprehended. Hence, we would suggest that we would keep and maintain the 6 most important factors separately be (1) Political Stability; (2), Infrastructure; (3)

Regulation and Supervision; (4) Legal / accounting / governance; (5) Market Openness; and (6) Labour supply & quality.

5.1.2 Question 2 – Strength or weakness of Hong Kong and Shanghai with respect to their geographic locations

Respondents are requested to evaluate the strength or weakness of Hong Kong and Shanghai regarding their accessibility and geographical location based on the below questions:

About accessibility and geographic location	Hong Kong	Shanghai
2.1 The city is close to major manufacturing / production sites		
2.2 The city situates at good time zone for international business?		
2.3 The city can be easily accessed by various kind of domestic / international transportation network (such as intercity highways, railway, sea-route, airways, etc.)?		

Respondents are then requested to put their evaluation in a 5-point scale, from "1" to "5" with "5" representing "totally agree" and "1" representing "totally disagree".

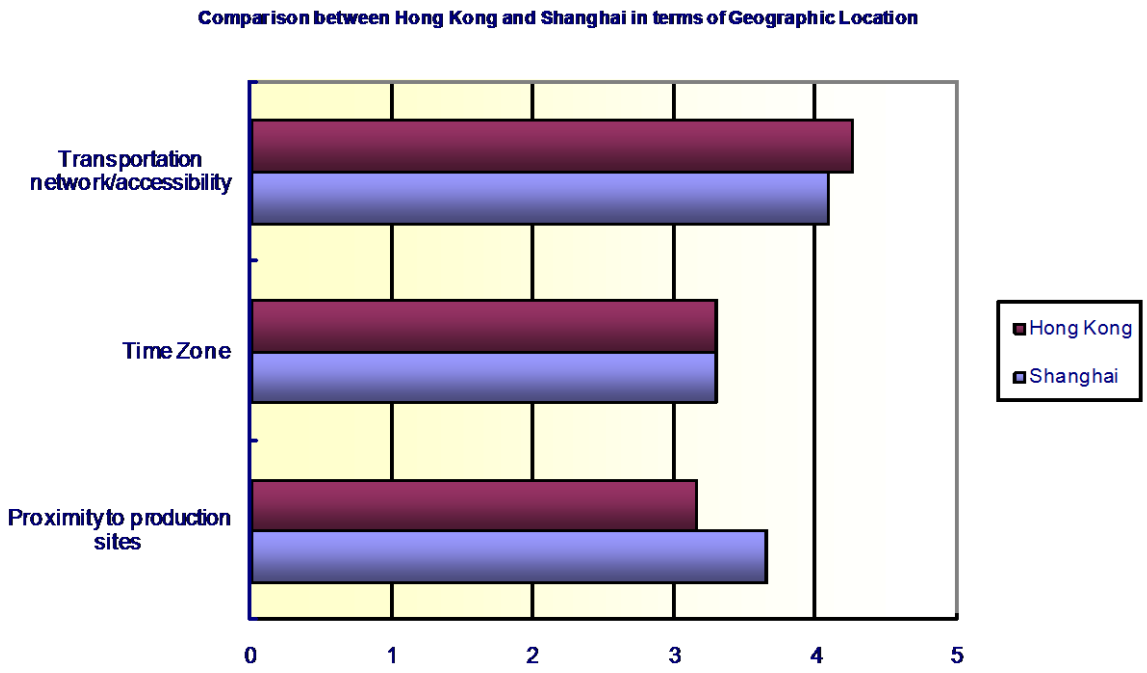
The mean and standard deviation are computed and shown in Figure 5.2a and the comparison is represented as a bar chart in Figure 5.2b.

Figure 5.2a: General Descriptive Data Analysis – Question 2

Analysis 2-1

Variable	Mean	Median
Hong Kong (Q2.1)	3.1515957	3.0000000
Shanghai (Q2.1)	3.6542553	4.0000000
Hong Kong (Q2.2)	3.2978723	3.0000000
Shanghai (Q2.2)	3.2978723	3.0000000
Hong Kong (Q2.3)	4.2606383	4.0000000
Shanghai (Q2.3)	4.0824468	4.0000000

Figure 5.2b Comparison of Hong Kong and Shanghai – geographic location and transportation network



Based on respondents' replies shown in Figure 5.2a and Figure 5.2b, respondents generally had a perception that Shanghai is more nearer to the manufacturing / production sites where finance or servicing industry are supporting. (Shanghai mean score 3.65 vs Hong Kong's 3.15) It is in line with the fact that due to the high rent and labour cost, Hong Kong industrialists have shifted their production sites northward since the 1980s, and gradually transformed Hong Kong operations into control and managerial headquarters, focusing mainly on high-end activities, such as research and development, information collection, merchandizing, marketing, and financing. For Shanghai, it is in close proximity to Wuhan -- a manufacturing centre. The city's well-established chemical and petrochemical industries serve as a basis for the production of plastics, synthetic fibres, and other products.

Both Hong Kong and Shanghai got high ratings in their transportation network (> 4) with Hong Kong (mean score: 4.26) slightly surpass Shanghai (mean score: 4.08). While Shanghai is benefited from being the central hub of China where it is connected with well-established railways and sea-route, Hong Kong is well connected by sea and by air to major international cities. For the factor of time zone, it is not surprising that the two cities got the same rating (mean score: 3.30) as they lie in the same time zone, i.e. GMT +8.

From the responses to this question, while we may see that although Shanghai is perceived to be located more nearer to the production or manufacturing cites which may be a factor contributing to the growth of its servicing industry, it could be compensated by having a better man-made transportation network to

improve its accessibility. Nevertheless, as concluded in the previous question (Question 1), proximity to production or manufacturing sites is a less important factors than good accessibility from better transportation network contributing to the development of an international financial centre.

5.1.3 Question 3 – Strength or weakness of Hong Kong and Shanghai with respect to their quality of labour and labour supply

Respondents are requested to evaluate the strength or weakness of Hong Kong and Shanghai regarding their human resources based on the below questions:

About human resources	Hong Kong	Shanghai
3.1 There is large supply of skilled human resources		
3.2 Human resource has good language skills		
3.3 Cost of human resource is low		
3.4 Human resource is of high educational level		
3.5 Human resource is highly adaptable to changes		
3.6 Employees work long hours		
3.7 The city has good quality of labour		

The mean and standard deviation are computed and shown in Figure 5.3a and the comparison is represented as a bar chart in Figure 5.3b.

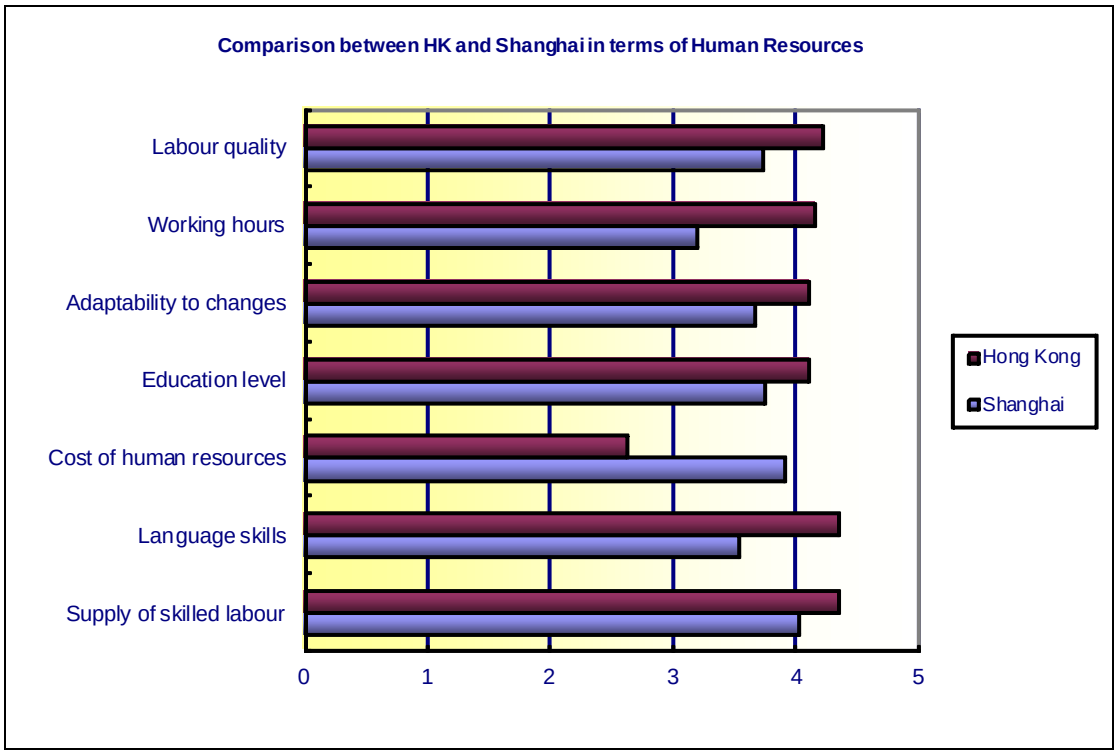
Figure 5.3a: General Descriptive Data Analysis – Question 3

Analysis 3-1

The MEANS

Variable	Mean	Median
H1	4.3510638	4.0000000
S1	4.0239362	4.0000000
H2	4.3377660	4.0000000
S2	3.5319149	4.0000000
H3	2.6143617	3.0000000
S3	3.9095745	4.0000000
H4	4.0930851	4.0000000
S4	3.7420213	4.0000000
H5	4.1037234	4.0000000
S5	3.6675532	4.0000000
H6	4.1409574	4.0000000
S6	3.1888298	3.0000000
H7	4.2207447	4.0000000
S7	3.7207447	4.0000000

Figure 5.3b Comparison of Hong Kong and Shanghai – Human Resources



Based on respondents' replies shown in Figure 5.3a and Figure 5.3b, respondents generally had a perception that human resources in Hong Kong are competitive with high mean scores (more than 4) and are far better than Shanghai in all aspects except the cost of labour. Working hours (4.14 for Hong Kong versus 3.19 for Shanghai), language skills (4.34 for Hong Kong versus 3.53 for Shanghai) and labour cost (2.62 for Hong Kong versus 3.91 for Shanghai) are factors showing large discrepancy. According to a survey done carried out jointly by the University of Hong Kong and CSR Asia in 2008, the average working week in Hong Kong is 49.6 hours and there is no labour law limiting the number of working hours. In contrasts, for Shanghai, the Labour Law in China limits the working hour under 8 hours per day and 44 hours a

week on average. Hence, it probably explains the perceived large difference of working hours between Hong Kong and Shanghai. On the other hand, Shanghai enjoys the advantage of low labour cost. According to statistics from China State Statistics Bureau in 2010, the average annual wage rate in Shanghai was 63,549 yuan, which is much lower than that of Hong Kong‘s HK$210,000 (or about RMB 180,000).

While it was shown in the Question 1 of our questionnaire that quality of labour and labour supply is perceived to be an important factor for a city to develop itself into an international financial centre, it is then an obvious discussion that the future of Hong Kong or Shanghai will be to a large extent hinge on its quality of labour. Nevertheless, local and foreign companies in both Hong Kong and Shanghai have complained about the shortage of talent and increasing wages. While training and education may assist improve the quality of labour in longer run, a quicker fix in addition to internal resources may need to be done. In other words, the capability of Hong Kong and Shanghai to attract influx of talent and skilled manpower will be the key. As Hong Kong's economy continues its integration with the Chinese economy, the selective inflow of population from across the border and the continuous circular flow of global talent to work in Hong Kong must be addressed with great urgency. In this respect, however, Shanghai has a natural advantage because of its unfettered access to China's vast talent pool.

5.1.4 Question 4 – Strength or weakness of Hong Kong and Shanghai with respect to their economic environment

Respondents are requested to evaluate the strength or weakness of Hong Kong and Shanghai regarding their economic situation and environment based on the below questions:

Economic environment	Hong Kong	Shanghai
4.1 Strong economic growth		
4.2 Low inflation		
4.3 Low unemployment		
4.4 Open market for foreign exchange and stable exchange rate		
4.5 Low cost of properties		

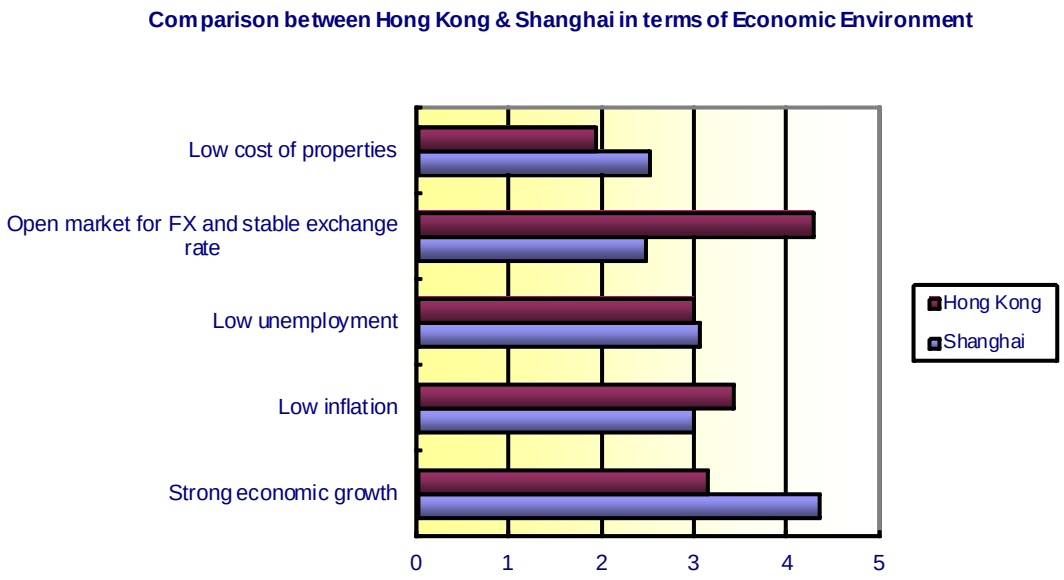
The mean and standard deviation are computed and shown in Figure 5.4a and the comparison is represented as a bar chart in Figure 5.4b.

Figure 5.4a: General Descriptive Data Analysis – Question 4

The MEANS Procedure

Variable	Mean	t Value	Median
H1	3.1409574	91.67	3.0000000
S1	4.3430851	141.55	4.0000000
H2	3.4095745	80.50	3.0000000
S2	2.9920213	61.39	3.0000000
H3	2.9787234	69.93	3.0000000
S3	3.0585106	92.33	3.0000000
H4	4.2872340	90.71	4.0000000
S4	2.4707447	51.57	2.0000000
H5	1.9361702	43.57	2.0000000
S5	2.5186170	43.08	2.0000000

Figure 5.4b Comparison of Hong Kong and Shanghai – Economic Environment



For the openness of foreign exchange and stability of exchange rate, it is obvious that Hong Kong (mean score: 4.28) scores much higher than Shanghai (2.47) because of the central government controlled exchange rate and the inconvertibility of China currency (RMB). Yet, on the other hand, for economic growth. Shanghai got 1.2 points higher than Hong Kong, scoring at 4.34. Shanghai also outperforms Hong Kong for her lower cost of properties (2.51 versus 1.94) and lower unemployment rate (3.06 versus 2.98).

As economic environment is not shown as one of the key top six factors contributing to the growth of an international financial centre and economic environment is something which is more remote and difficult for policy maker to manage and control, it is advised that policy makers in both Hong Kong and Shanghai may focus more on those other factors which are more easier to be managed and controlled.

5.1.5 Question 5 – Strength or weakness of Hong Kong and Shanghai with respect to political environment and government support

Respondents are requested to evaluate the strength or weakness of Hong Kong and Shanghai regarding their political stability and government support based on the below questions:

Political stability and Government support	Hong Kong	Shanghai
5.1 There is a stable political environment		
5.2 Government is active in promoting the city as an international financial center		
5.3 There exists a low tax rate environment		

The mean and standard deviation are computed and shown in Figure 5.5a and the comparison is represented as a bar chart in Figure 5.5b.

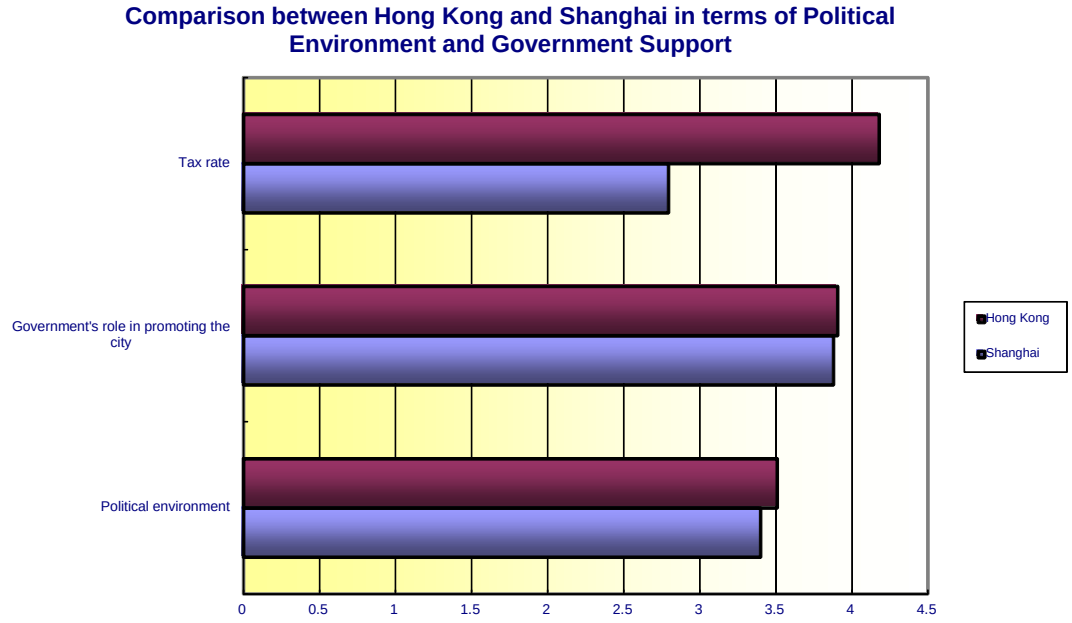
Figure 5.5a: General Descriptive Data Analysis – Question 5

Analysis 5-1

The MEANS Procedure

Variable	Mean	t Value	Median
H1	3.5106383	83.38	4.0000000
S1	3.3989362	66.70	4.0000000
H2	3.9069149	71.95	4.0000000
S2	3.8829787	65.15	4.0000000
H3	4.1808511	104.50	4.0000000
S3	2.7978723	74.54	3.0000000

Figure 5.5b Comparison of Hong Kong and Shanghai – Political Environment and Government Support



In general, the survey revealed that Hong Kong outdoes Shanghai in terms of its political environment and government support, especially tax rate (mean score = 4.18). Hong Kong is famous for its low tax rate and simple tax system – no tax on dividend, interest or capital gain tax. There is a consensus that Hong Kong business enjoys a much lower tax environment than the Shanghai counterparts. In fact, the tax rate in Hong Kong is among one of the lowest in the world. For Shanghai, it only got mean score of 2.47 which is 1.7 lower than that of Hong Kong. For government's effort in promoting the place, both Hong Kong Government and Shanghai Government did a good job in promoting their own cities (mean score around 3.9). Both governments also did a rather good job in keeping political stability with 3.5 points for Hong Kong and 3.4 points for Shanghai. As political stability is perceived to be a very important factor for an international financial centre, perhaps it is also the reason why the Central

Government of China weighs a stable society as one of the most important aims for the country.

5.1.6 Question 6 – Strength or weakness of Hong Kong and Shanghai with respect to the establishment and development of infrastructure

Respondents are requested to evaluate the strength or weakness of Hong Kong and Shanghai regarding their infrastructural support on the below questions:

Infrastructure	Hong Kong	Shanghai
6.1 Good telecommunication network		
6.2 Efficient settlement and payment system		
6.3 Effective legal system, accounting system, and corporate governance		

The mean and standard deviation are computed and shown in Figure 5.6a and the comparison is represented as a bar chart in Figure 5.6b.

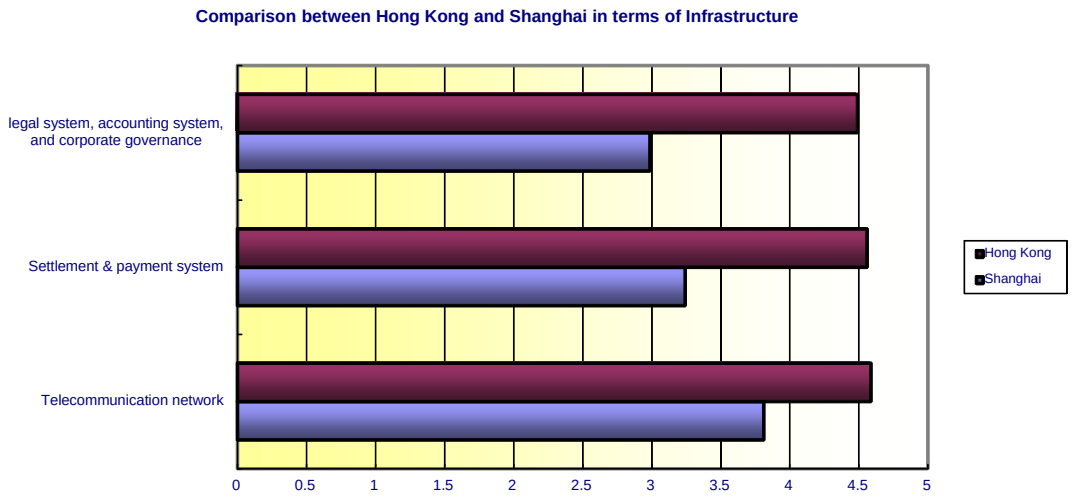
Figure 5.6a: General Descriptive Data Analysis – Question 6

Analysis 6-1

The MEANS Procedure

Variable	Mean	t Value	Median
Obs	188.5000000	33.63	188.5000000
H1	4.6010638	139.15	5.0000000
S1	3.8111702	92.84	4.0000000
H2	4.5611702	141.46	5.0000000
S2	3.2420213	81.53	3.0000000
H3	4.5026596	150.63	5.0000000
S3	2.9867021	73.48	3.0000000

Figure 5.6b Comparison of Hong Kong and Shanghai – Infrastructure



According to our survey, Hong Kong is perceived to have outperformed Shanghai significantly in her infrastructure. For telecommunication, Hong Kong got a mean score of 4.60 compared to Shanghai's 3.81. For settlement

and payment system, probably due to the more openness and sophistication of Hong Kong's banking industry than Shanghai's, Hong Kong got a mean score of 4.56, which is far above Shanghai's 3.24. For other systems such as legal, accounting, corporate governance), Hong Kong also got a high mean score of 4.5 compared to Shanghai's 2.99. The survey reflects that Shanghai still has a long way to catch up with respect to her infrastructural development.

5.1.7 Question 7 – Strength or weakness of Hong Kong and Shanghai with respect to the financial market supervision

Respondents are requested to evaluate the strength or weakness of Hong Kong and Shanghai regarding the sufficiency of financial market supervision on the below questions:

Regulation and Prudential Supervision	Hong Kong	Shanghai
7.1 Comprehensive rules and regulation on financial market		
7.2 Effective prudential supervision of financial market		

The mean and standard deviation are computed and shown in Figure 5.7a and the comparison is represented as a bar chart in Figure 5.7b.

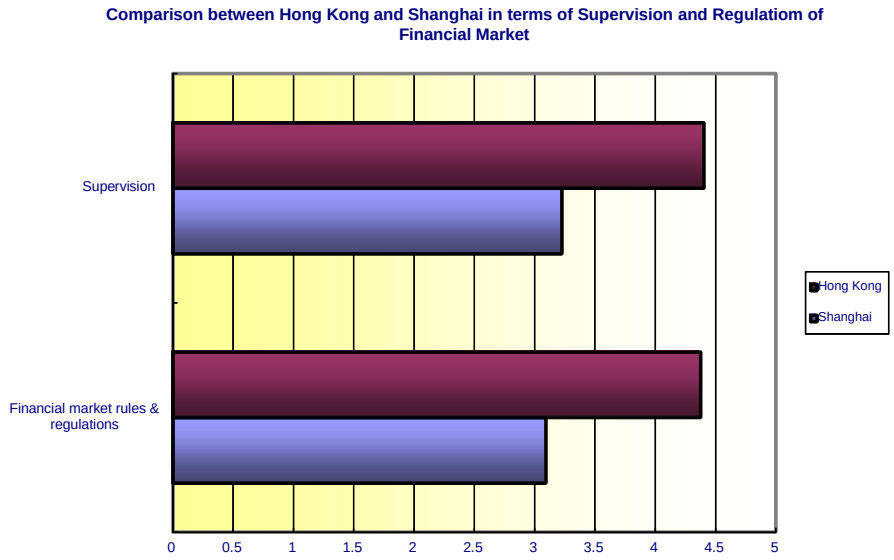
Figure 5.7a: General Descriptive Data Analysis – Question 7

Analysis 7-1

The MEANS Procedure

Variable	Mean	t Value	Median
Obs	188.5000000	33.63	188.5000000
H1	4.3776596	134.05	4.0000000
S1	3.0930851	75.33	3.0000000
H2	4.4042553	148.19	4.0000000
S2	3.2260638	76.65	3.0000000

Figure 5.7b Comparison of Hong Kong and Shanghai – financial market supervision



According to the survey, the general perception is that Hong Kong has better rules, regulations, and supervision on financial market than Shanghai. When

asked about the rules and regulation on financial market, respondents in general perceived that the rules and regulations in Hong Kong (mean score: 4.38) are more comprehensive than that in Shanghai (mean score: 3.10). In addition, for effective prudential supervision of financial market, Hong Kong (mean score: 4.40) also scores higher than Shanghai (mean score: 3.23).

Generally speaking, Hong Kong still maintains a British-derived legal system, and has had a stock market since 1891. The market, Asia's second largest after Tokyo, was then developed and retains a sound legal and regulatory system used to the dealings, disputes, claims and liabilities of international finance. Although Hong Kong does have a regulatory conflict between its commercial and regulatory position, generally speaking the market is well managed and possesses global credibility. Market manipulators, insider dealers and fraudsters are routinely jailed when caught, and the city retains an independent commission against corruption to monitor and look into such activities.

Mainland China is not in a position to provide that for Shanghai unless a massive evolution in the regulatory conflicts between state and commerce is undertaken. The past behavior also of some of China's own investment funds, including government-backed ones such as GITIC, and the constant play between China and Hong Kong over asset holdings and evasion of liabilities dictate that neither are many of mainland China's financial and political hierarchy able to fully appreciate the concepts of transparency and financial responsibility.

5.1.8 Question 8 – Perceived future performance of Hong Kong and Shanghai

Respondents are requested to put down their perceived future performance of Hong Kong and Shanghai with respect to the various identified success factors based on the below questions:

Success Factors	Hong Kong	Shanghai
Proximity to manufacturing / production site		
Transportation network		
Quality of labor and labor supply		
Infrastructure (such as settlement and payment structure, telecommunication, etc.)		
Political stability		
Regulation and Prudential Supervision on financial market		
Legal system, accounting system, corporate governance		
Openness to foreign markets and investors		
Cost of production (such as rental expense, wages, etc.)		
Government policy and support		
Economic growth		
Inflation		
Stability of currency		
Others (please specified: _____)		

The mean and standard deviation are computed and shown in Figure 5.8a and the comparison is represented as a bar chart in Figure 5.8b.

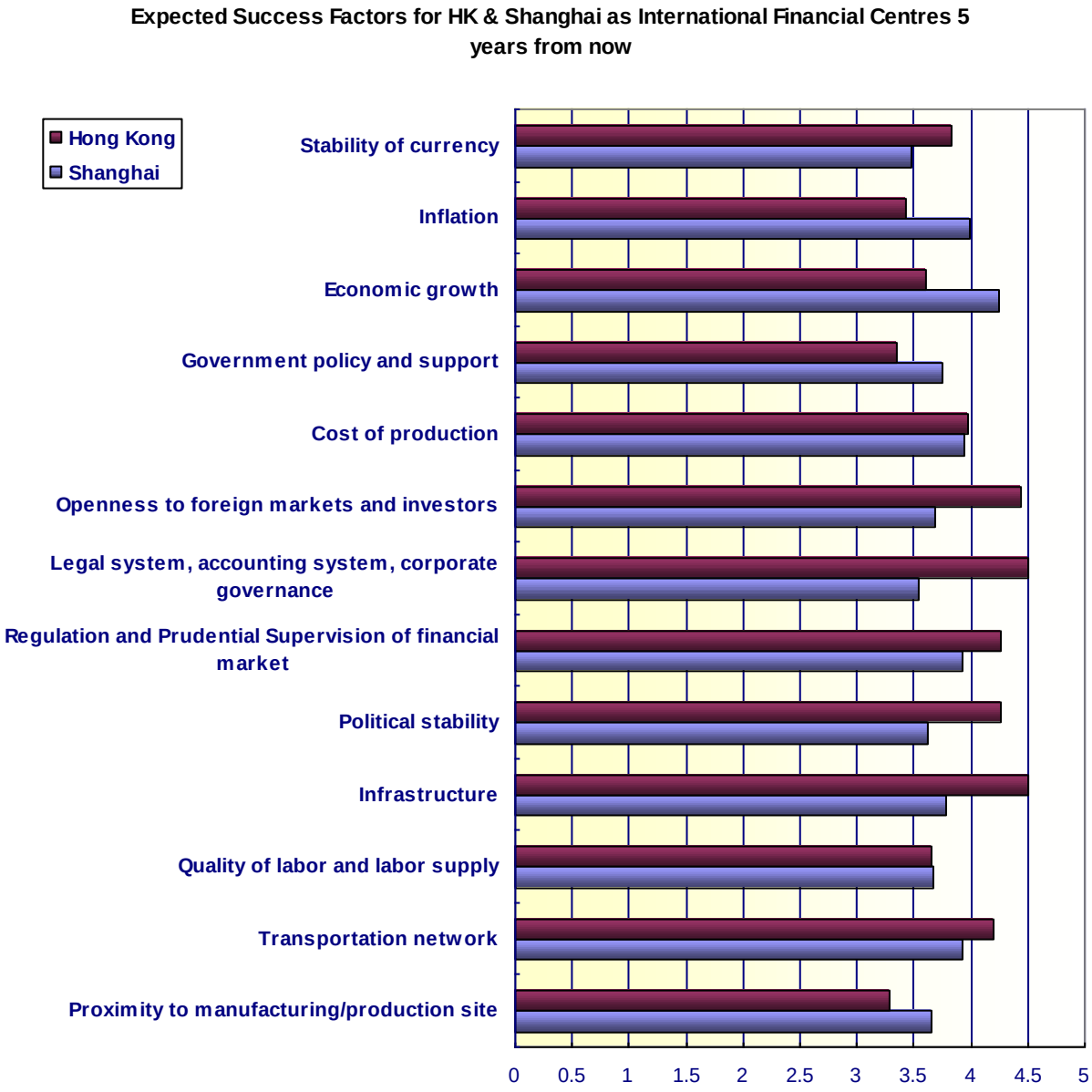
Figure 5.8a: General Descriptive Data Analysis – Question 8

Analysis 8-1

The MEANS Procedure

Variable	Mean	t Value	Median
Obs	188.5000000	33.63	188.5000000
H1	3.2845745	87.97	3.0000000
S1	3.6515957	110.01	4.0000000
H2	4.1968085	118.31	4.0000000
S2	3.9255319	120.39	4.0000000
H3	4.0877660	104.90	4.0000000
S3	3.8856383	114.61	4.0000000
H4	4.4787234	116.66	5.0000000
S4	3.6542553	99.27	4.0000000
H5	4.1170213	118.97	4.0000000
S5	3.8164894	89.51	4.0000000
H6	4.4388298	114.32	5.0000000
S6	3.6675532	92.13	4.0000000
H7	4.4734043	115.99	5.0000000
S7	3.5292553	81.00	4.0000000
H8	4.5691489	117.23	5.0000000
S8	4.0000000	109.54	4.0000000
H9	3.0930851	56.69	3.0000000
S9	3.4734043	77.98	4.0000000
H10	3.9202128	95.10	4.0000000
S10	4.2632979	123.90	4.0000000
H11	3.3936170	92.51	3.0000000
S11	4.2606383	114.14	4.0000000
H12	3.3643617	123.24	3.0000000
S12	3.4122340	77.82	3.0000000
H13	3.9654255	109.02	4.0000000
S13	3.5691489	83.41	3.0000000

Figure 5.8b Comparison of Hong Kong and Shanghai – Perception on future performance



In the not too distanced future, it is anticipated that economic growth and inflation will craft Shanghai into an International Financial Centre while political stability, infrastructure, openness to foreign markets, legal system, accounting system and corporate governance continue to contribute Hong Kong to become an international financial centre. Regarding the various success factors, while inflation is seen to be similar for both Hong Kong and Shanghai in the future, it is in the view that Hong Kong will continue to outperform Shanghai in the following aspects: (1) Transportation network, (2) Quality of labour and labour supply; (3) Infrastructure; (4) Political stability; (5) regulation and prudential supervision financial market; (6) legal system, accounting system, and corporate governance; (7) opening to foreign markets and investors; and (8) stability of currency.

Yet, on the other hand, Shanghai will has advantage over Hong Kong on (1) proximity to manufacturing / production site; (2) cost of production; (3) government policy and support; and (4) economic growth.

Chapter 6: Theory versus Reality and Future Prospects

6.1 Theory versus Reality

To bridge the gap between theory and practice, we would in this chapter highlight and assess the major theories from academic literatures[13] (from Chapter 3) against the actual historical development of Hong Kong and Shanghai.

In general, we note that most of the reviewed economic theories from literatures are well supported. The classic Supply and Demand Theory (Smith 1776) is well supported and evidenced by the historical development of Hong Kong and Shanghai that financial service did play a very important role to support and facilitate many real economic activities and functions, such as manufacturing, wholesale, trades, capital raising, construction, and investment in the development of both the Hong Kong and Shanghai. Similar to many other services or products, the development or blooming of financial service is much affected by demand or the industries that it supported. For Hong Kong, the development of Hong Kong as a financial centre in the early years was attributable to the large demand in financial services derived from increasing traders as Hong Kong was an entrepot to serve as a gateway between China and western countries. Similarly, for Shanghai, The development of Shanghai as a financial centre was also attributable by the huge demand on financial

[13] The classic Supply and Demand Theory; Location Theory and Central Place Theory; Urban Economic Growth Theory; Economies of scale (Internal and External); Information; Self-reinforcing (or Cumulative Causation Theory); Regulations and Prudential Supervision; and Resources based view, World Competiveness Ranking by IMD, the GFCI by Z/Yen Group, etc.

service due to the tremendous growth in international trades in early years. The rise and fall of a financial sector aligned closely with the real economic sector as it is well evidenced by the large slump in financial sector when the real economic sector was hard hit during the Second World War, Korean War, cultural revolutions, etc. as discussed in Chapter 2.

The various location theories (Thunen 1826, Weber 1969, Losch 1954) and the Central Place Theory (Christaller 1966, Crocco, Calvante and Castro 2006) are also well supported even though those were originally referred more to the physical goods and products. For Hong Kong, this model is well supported by the geographic location of Hong Kong, which is located at the centre of south-east Asia which can be easily accessible by ship from South-east Asia countries or by railway from China cities. This also helps provide financial service to cope with the fast trading and business growth in the Southeast Asia region. For Shanghai, these theories are well supported by the geographic location of Shanghai which is situated halfway between most prosperous cities along the eastern coast of China. Shanghai is well linked by railways with most major cities which greatly reduce transportation costs for attracting less costly labour from nearby places and enhanced proximity with firms, which require financial services.

Regarding the Urban Economic Growth Theory (Jacob 1975), for Hong Kong, it is well supported by the historical development of Hong Kong where the economic growth is mainly export or re-export driven. In addition, the influx of immigrants during 1950s from neighbouring areas into Hong Kong further boosted its economic growth of Hong Kong and turned Hong Kong to become an economic pole for the region. Similarly, for Shanghai, to a certain large extent, the growth of Shanghai is

also supported by the export activities. Shanghai has one of the busiest ports of China around the corner. The growth of Shanghai has drawn substantial resources from places around and it was also an economic pole where most financial activities happened there to support economic activities in neighbouring areas.

According to the academic literature, economies of scale can help achieve enhance efficiency and achieve more competitive pricing of financial services and instruments. (Rosenthal and Strange 2001) Financial institutions may gain from higher liquidity by joining each other in organized markets and benefit from close business contacts with each other. Not only may financial institutions form closer business relationships with each other should their establishments be in the same city, a group of trades and professionals is more likely to grow around such a group of financial institutions to provide professional services such as accounting, legal consultancy, computer programming, research. For both Hong Kong and Shanghai, an external economy of scale is evidenced in the development of the two places. Cost of financial services declined as competition rises as the number of financial institutions increases in the city. Besides, it also helped improve the quality of information and minimise information asymmetry when there is a standardised rule or system, where there is economies of scales with large number of financial institutions and relevant organisations around, to ensure high transparency of information. Hong Kong has its accounting standard, legal system, financial practice, etc., most in line with the international standard. Such alignment greatly enhances the transparency of the financial system in Hong Kong. The minimisation information asymmetry facilitates investors and stakeholders to invest and conduct business in Hong Kong. For Shanghai, the importance of standardising information disclose is getting more and more apparently when China is bringing itself aligned with the international practices

and standards in recent years. Nevertheless, compared to Hong Kong where most of accounting standard, legal system, etc., have long been internationalised, Shanghai is lagging behind.

According to Self-reinforcing or Cumulative Causation theory (Pagano et al 2002), a financial centre will go through a self-reinforcing process during which an impulse to a system triggers further changes in the same direction as the original impulse, thus taking the system further away from its initial position, and hence, a financial institution could achieve significant gain from operating business in a financial centre with large critical mass and such gain become self-reinforcing. For Hong Kong, the continual growth of Hong Kong as an international financial centre was attributable to the growing number of financial institutions and financial services offered which contribute to the development of hub of financial institutions where bankers and finance practitioners gather, meet, and interact. In addition, the developed platform served well in promoting further banking business with clients. For Shanghai, The growth of Shanghai as a financial centre before 1949 was also self-reinforced by the growing number of financial companies and financial service activities in the city. As the number of financial companies and financial activities grew, there was an attraction of business to the area and turned it to become a financial hub.

Regarding the discussion on regulations and prudential supervision, for Hong Kong, compared to many other international financial centres in the western countries, Hong Kong is a good example to see that a high standard of regulation and prudential supervision is critical to help it survive through the Asian Financial Crises in 1998 and the banking crises in 2008. For Shanghai, it is often said that regulations and prudential supervision are both angel and devil for a city to become a financial centre.

Shanghai is probably a good example to see that loose government control and regulation for companies operating in the "tenant areas" had in fact facilitated its emergence as a financial centre before 1949. Hence, it supported our previous discussion that regulations and prudential supervision could be a two-edge sword.

Resources based view (Barney 1991) refer to the identification of certain resources which are hard to be transferred and imitated and these resources may become the source of comparative advantage for a city to be an international financial centre. Comparing Hong Kong and Shanghai, other than geographical location, it is more the "software" of Hong Kong different from that of Shanghai. While it is untrue to regard the "software" is completely non-transferrable and non-imitable, many of them such as labour quality, legal system, etc., takes a much longer time to change and imitate. For Shanghai, while Shanghai is working hard to improve its "hardware" such as infrastructure, it is more the "software" that may require a bit longer for Shanghai to catch up. In particularly, the currency of China, RMB, has not yet been freely convertible, and it will remain one of the key hindrances for Shanghai to be a real international financial centre in the global platform.

6.2 Future Prospects of Hong Kong and Shanghai

While we have compared and assessed the academic literatures based on the historical development of Hong Kong and Shanghai (Chapter 2 and 3 and Session 6.1) and have also identified a number of key success factors (Chapter 5) which are perceived important contributing to the development of Hong Kong and Shanghai as international financial centres, our analysis and research objective won't be complete

and met if we don't discuss the latest developments and futures, taking into account of the strength and weakness, of these two places as well as the dynamics (i.e. competition or complementary roles) of them which was not previously covered in the survey study.

Looking forward, it is expected that the role of Hong Kong and Shanghai (as well as their cooperation and complementary Roles) as an international financial centre will continue to be a focus. In April 2009, the State Council of China announced that Shanghai would develop as an international financial centre by 2020. In addition, in January 2010, Hong Kong and Shanghai signed the "Memorandum of Understanding Concerning Advancing Hong Kong-Shanghai Financial Co-operation". It confirmed support from central government of China on the development of an offshore RMB market in Hong Kong and possible study for the creation of an offshore RMB market in Shanghai. These developments highlight the cooperation and complementary roles between Hong Kong and Shanghai, with both assuming their roles as international financial centres in the China's strategic development plan. At present, Hong Kong and Shanghai differ in their developmental stages as financial centres as Hong Kong is a relatively more matured international financial centre where market participants, compared to those in Shanghai, enjoy higher market liquidity, more competitive pricing and more reliable operation. These would enable Hong Kong to attract more financial market activities. In addition, Hong Kong has a comparatively more sound system, such as free flow of capital, diversified talents, and good in allocating financial resources in the world. Yet, Hong Kong is not without weakness or shortcomings. As for Hong Kong's weakness, Hong Kong has always been suffering from its small economic size and mature status that offers limited domestic growth potential. In addition, as Hong Kong is a special administrative region of China and adopts a

different financial regulatory framework, hence, its capability to serve the demand from the Mainland China has been largely constrained by China's maintenance of strict control over capital flow and currency convertibility.

For Shanghai, its major advantages lie in the central government's policy to promote it to be an international financial centre as well as its strengths in innovative technology and industries. In addition, being the pioneer in China's financial reform, Shanghai has particular competitive edges in absorbing Mainland capital and talents, and serving the whole country, and it is in good position to benefit from the growth momentum of the Yangtze River Delta economy. In addition, Shanghai is much geographically closer and better integrated with the rapidly growing domestic Chinese market.

Yet, as indicated from our survey (Chapter 5), it is perceived that Shanghai still lags behind Hong Kong in various key aspects such as currency convertibility, openness of capital account, maturity of financial markets, infrastructure, effective financial supervision and soundness of legal system. In addition, although not covered in the survey, Shanghai also lagged behind Hong Kong in terms of the popularity of being used as a regional headquarter by international banks. Even though some banks, such as Citibank, HSBC, Standard Chartered Bank, etc., have set up their China headquarters in Shanghai, their APAC regional headquarters are outside China, mainly in either Hong Kong or Singapore.

Despite the differences in developmental stages between Hong Kong and Shanghai, competition exists between them, for example, with the rise of Shanghai stock markets in particular, more enterprises have listed in the Shanghai and the

competition between Hong Kong and Shanghai has become keener than ever for listing resources. To compete and to boost listings of foreign companies, the Hong Kong Stock Exchange has accepted more listing applications by overseas corporations from qualified jurisdictions since March 2007. Nevertheless, with the forthcoming launch of the "international board" in Shanghai, there will be heads-on competition with Hong Kong on potential companies from overseas. Other than competition for potential listing on the stock market, the two places are also competing intensively on talent acquisition. At present Hong Kong is still seen as much more developed than Shanghai and possesses more professional and entrepreneurial talent. Hong Kong investors also dominate the Pearl River Delta and constitute the largest group of foreign investors present in the Yangtze River Delta although their role is much less dominant. However, Hong Kong's ability to bring in entrepreneurial and professional talent from the Mainland suffers from restrictive immigration and travel barriers. Shanghai, on the other hand, benefits from the influx of entrepreneurial and professional talent from all over China, including Hong Kong, and from overseas. In the long run, the renewal of human talent capital could be a critical issue for Hong Kong where in this regard Shanghai would have a competitive advantage.

In summary, Hong Kong's strength is its superior integration with the global market and its adoption of international standards and practices. Hong Kong provides an excellent platform and set of institutions to facilitate mainland China's financial reforms and development immediately, while Shanghai has some catching up to do, although its closeness to the domestic market remains a long term competitive strength. While both Hong Kong and Shanghai have aspirations to serve as

international financial centres for the region, Hong Kong and Shanghai each has its own advantages and weaknesses and they differ in developmental stages, models and the hinterlands, i.e. Pearl River Delta and the Yangtze River Delta, they serve, they are both highly complementary with and competing against each other. The development of these two places in the future will continue attract attention from economists, policy makers, business people, etc. in the wider world-wide platform.

6.3 Suggested Future Research Work

While this study identifies a number of key success factors[14] which are perceived to be most important in contributing to the development of international financial centres, it is suggested that in the future, researchers may want to explore further on how and why these six abovementioned factors are perceived to have more significant contribution to the development of international financial centres. Besides, researchers may look into and assess the development of other financial centres such as Tokyo, London, New York, etc. with respect to these six identified factors.

For Hong Kong and Shanghai, while it could be that the future success of these two places as international financial centres may hinge on the abovementioned key success factors in the future, it will be interesting to extend the study to explore more on how the government or authorities of these two places may further strengthen and

[14] The study reveals that the six most important factors are: (1) Political Stability; (2) Infrastructure; (3) Regulation and Prudential Supervision; (4) Legal / accounting / governance systems; (5) Market Openness; and (6) Labour supply & quality.

make good use of these factors to strengthen the status of these two places as international financial centres.

In addition, other than studying Hong Kong and Shanghai in isolation, it will also be very much contributory if future research may also look into the dynamics (i.e. competition and complementary) between the two places in more details. Expanding from the competition and complementary dynamics between Hong Kong and Shanghai, researchers may also extend to examine other regions where competition may exist or potentially exist between two or more centres, such as Toronto versus New York in North America; London versus Frankfurt in Europe; etc. or even further to study the global competition and complementary dynamics between global financial centres such as London versus New York.

In summary, it is believe that future studies in this topic will be very much contributory not only for academic literatures development but also provide much insight to the government and / or policy marker on strategic planning decision.

Chapter 7: Conclusions

The success of Hong Kong and Shanghai as international financial centres to a certain large extent depends much on their attractiveness to financial institutions providing international financial services out from Hong Kong or Shanghai. Financial businesses as well as talent will flow to those centres where market information resides, and such information tends to be concentrated in places where the rule of law is well established and market institutions are robust.

This paper argues that, owing to marked differences in historical circumstances and policy regimes, Shanghai and Hong Kong have followed very different paths of financial development. After more than three decades of international isolation and "financial repression" (Chapter 2), despite Shanghai has been developing very fast after the Chinese Government had adopted the Open Door Policy since 1979, Shanghai has still some way to go before it can become a genuine international financial centre. For the time being, it is more a national financial centre for some time to come until full convertibility of RMB, openness of market, relevant infrastructure, regulations and prudential supervisions in place (Chapter 3).

In this study, several major relevant economic theories extracted from academic literatures were reviewed and assessed (Chapter 3). It was found that the academic literatures in relation to, such as Supply and demand theory, Location Theory, and Central Place Theory, Urban Economic Growth Theory, Export-based Theory,

Growth Pole Theory, Economies of scale (Internal and External), Information, Self-reinforcing (or Cumulative Causation Theory) etc., are in general quite well supported and evidenced by the historical development of Hong Kong and Shanghai (Chapter 6). Based on the academic literatures, past historical development of the two places, and consultation with finance professionals, a survey was conducted to collect feedback on what the key success factors or attributes[15] which are perceived to be most important to the development a financial centre and how Hong Kong and Shanghai score with respect to these factors. Our survey study (Chapter 5) indicated that industry practitioners perceive that the six most important key success factors amongst the fourteen factors which may be attribute to the development of international financial centres are: (1) Political Stability; (2) Infrastructure; (3) Regulation and Prudential Supervision; (4) Legal / accounting / governance systems; (5) Market Openness; and (6) Labour supply & quality.

The study (Chapter 5) also revealed that by comparing Shanghai and Hong Kong, the past and present success of Hong Kong over Shanghai as an international financial centre, based on the perception of the industry practitioners, is probably due to the fact that Hong Kong is perceived to have better infrastructure, financial market regulations, quality of human resources, economic environment and political environment & government support than Shanghai at present and in the past. It agreed with the analysis in Chapter 3 that seems that compared with Hong Kong, in respect of the essential conditions for an international finance centre, Shanghai either

[15] (1)Proximity to manufacturing / production site; (2)Transportation network; (3)Time zone; (4) Quality of labour and labour supply; (5)Infrastructure; (6)Political stability; (7)Regulation and Prudential Supervision of financial market; (8)Legal system, accounting system, corporate governance; (9)Openness to foreign markets and investors; (10)Cost of production; (11)Government policy and support; (12)Economic growth; (13)Inflation; and (14)Stability of currency

has not yet fulfilled them, or is only beginning to fulfil them, whereas Hong Kong has fulfilled them more.

Lastly, while we believe that the future prospect of Hong Kong and Shanghai will to a large extent hinge on how well the policy makers of Hong Kong and Shanghai can further enhance their various key attributes of being successful international financial centres respectively, the dynamics (i.e. competition and complementary) between Hong Kong and Shanghai as highlighted in the last chapter (Chapter 6) should not be ignored. Although our study does not cover the dynamics of these two places, it is definitely a topic that can be discussed in greater details for future research. Besides, it is also suggested (Chapter 6) that for future research, interested researchers may consider extend to examine other regions where competition may exist or potentially exist between two or more centres, such as Toronto versus New York in North America; London versus Frankfurt in Europe; etc. or even further to study the global competition and complementary dynamics between global financial centres such as London versus New York.

References

Alessandrini, P and Zazzaro, A (1999) "A possibilist approach to local financial systems and regional development: the Italian experience". In: MARTIN, Ron (ed.). *Money and the space economy.* Londres: Willey, 1999.

Amado, A (1997) "A questão regional e o sistema financeiro no Brasil: uma interpretação pós-keynesian" *Estudos econômicos*, v.27, n.3, p.417-40, 1997.

Arestis, P and Demetriades, P (1999) "Financial Liberalisation: The Experience of Developing Countries". *Eastern Economic Journal*. Bloomsburg. Fall 1999.Vol 25.Issue 4. 441- 457, 1999.

Bancel, F and Mitoo, U R (2001), "*European Managerial Perceptions of the Net Benefits of Foreign Stock Listings"*, European Financial Management 7, 213-236, 2001

Blaug, M (1979) "German hegemony of Location theory: a puzzle in the history of economic thought", *History of Political Economy*, 11 (1), April, 21-9, 1979.

Blejer, M and Sagari, S (1987) "The structure of the Banking Sector and the Sequence of Financial Liberalisation" *Economic Reform and Stabilisation in Latin America* edited by Connolly, M and Gonzale Vega, C. New York : Praeger, 93-107, 1987.

Brennan and Subrahmanyam (1996) “Market Microstructure and Asset Pricing: On the compensation on illiquidity of stock returns” *Journal of Financial Economics*: 41 441-464, 1996.

Burn, D L (1958) *The Structure of British Industry*, Cambridge University Press, 1958.

Carroll, J (2007) *A Concise History of Hong Kong,* Rowman and Littlefield, 2007

Caprio, G and Klingebiel, D (1996) “Bank Insolvencies: Cross-country Experience”, *Policy Research Working Paper 1620,* The World Bank, 1996.

Carse, D (1995) “Market Entry and Asset Quality” in *Money and Banking in Hong Kong,* Hong Kong: Hong Kong Monetary Authority pp. 74-84, 1995.

Chen, Y (1995) “Financial Relation between Hong Kong and the Mainland,” in *Money and Banking in Hong Kong,* Hong Kong: Hong Kong Monetary Authority pp. 47-55, 1995.

Chen, Y. (1995) “Prospect for the Financial Relationship between Hong Kong and the Mainland after 1997,” in *Money and Banking in Hong Kong,* Hong Kong: Hong Kong Monetary Authority pp. 38-43, 1995.

Chhibber, A, Ghosh, J and Palanivel, T “The Global Financial Crisis and the Asia Pacific Region”, UNDP Regional Centre for the Asia and the Pacific, November 2009.

China Statistics Yearbook 2011 by the National Bureau of Statistics of China, 2012

Christaller, W (1966) *Central Places in Southern Germany.* New Jersey: Prentice-Hall, 1966.

Crocco, M A (1999) *Uncertainty, technical change and effective demand.* Ph.D. Thesis, University of London, 1999.

Crocco, M A (1999) "Innovation and social probable knowledge" *Cambridge Journal of Economics*, v. 27, n.2, 2003, p.177-90, 1999.

Crocco, M A, Cavalcante, A and Castro (2006) "The behaviour of liquidity preference of banks and public and regional development: the case of Brazil" *Journal of Post Keynesian Economics*, v.28, n.2, 2006, p.217-40, 2006.

Davidson, P (1982) "Rational Expectations: A fallacious foundation for studying crucial decision-making processes. *Journal of Post Keynesian Economics*, v.5, n.2, Winter 1982–83, p.182-96, 1982.

Davidson, P (1988) "Efficiency and Fragile Speculative Financial Markets. Against the Tobin Tax and for a Credible Market Maker." *The American Journal of economics and sociology*.NewYork Oct., 1998.

Delong and Summers (1991) "Equipment Investment and Economic Growth". *Quarterly Journal Economics*, Cambridge, May 91 Vol 106,Iss.2, 445-602, 1991.

Dicken, P and Lloyd, P (1990) *Location in space: theoretical perspectives in Economic Geography*. 3rd. Ed., New York: Harper Collins, 1990.

Dow, S (1982) "The regional composition of the money multiplier process" *Scottish Journal of Political Economy,* v.19, n.1, 1982.

Dow, S (1987), "The treatment of money in regional economics" *Money and the economic process*. 1987.

Dow, S (1993) *Money and the economic process*. Cambridge: Edward Elgar, 1993.

Dooley, M P and Mathieson D J (1987) "Financial Liberalisation in Developing Countries. Why Financial Markets are inefficient and how they can be improved". *Finance and Development* pp31-34, Sept 1987.

Dufey, G. and I. H. Giddy (1978). The International Money Market (Englewood Cliffs, N. J. Prentae-Hall Inc.), 1978

Ethridge, D (1995), *Research Methodology in Applied Economics, Organizing, Planning and Conducting Economic Research,* Iowa State University Press, 1995

Fakiyesi, T (2009), "Building an International Financial Centre: A Panel Discussion on the Occasion of the 50th Anniversary of Central Bank of Nigeria", 2009.

Felix, D (1997) “On Drawing General Policy Lessons from Recent Latin American Currency Crisis”. *Journal of Post Keynesian Economics*. Armonk. Winter 1997-98.

Frobel, F, Jurgen, H, and Otto, K (1980) *The New International Division of Labour.* Cambridge University Press, 1980

Garbage, K D and Silber, W L (1978) “Technology, Communication and the Performance of Financial Markets: 1840-1975,” *Journal of Finance* 33, No. 3: 819-832, 1978.

Ho, Y K, R. Scott, and K.A. Wong, eds. (1991) *The Hong Kong Financial Systems* Hong Kong: Oxford University Press, 1991.

Holland, S (1976) *Capitul versus regions.* New York: St. Martin, 1976.

Hong Kong Annual Digest of Statistics 2011. Census and Statistics Department HKSAR, 2012

Hoover, E M (1971) *An introduction to regional economics.* New York: Alfred A. Knopf, 1971.

Huat, Lim, and Chen (2004) “Competing International Financial Centres: A Comparative Study between Hong Kong and Singapore”, *Paper for Saw Centre for Financial Studies and ISEAS Conference in November 2004 – Singapore as a Financial Centre: Development and Prospects.*, 2004.

Hui, G W L (1992). "Ranking Hong Kong as an International Financial Center," *Hong Kong Economic papers* 22: 35-45, 1992.

Hui, G W L (2003) "A Quarter Century after: A Survey of Hong Kong as an International Financial Centre", in Simon Ho, Robert H. Scott, and K. A. Wong (eds.) *The Hong Kong Financial System,* 2nd edition, (Hong Kong: Oxford University Press), 2003.

Isard, W (1956), *Location and space economy: a general theory relating to industrial location, market areas, land use, trade, and urban structure*. Cambridge: MIT Press, 1956.

Isard, W (1960) Methods of regional analysis: an introduction to Regional Science, Cambridge: MIT Press, 1960.

Jao, Y C (1979) "The Rise of Hong Kong as a Financial Centre", *Asian Survey*, Vol. 19, July, pp. 674-694, 1979.

Jao, Y C (1980) "Hong Kong as a Regional Financial Centre: Evolution and Prospects", in C. K. Leung, J. W. Cushman, and Wang Gungwu (eds.), Hong Kong: Dilemma of Growth (Carrberra: Australian National University Press), pp. 161-194; reprinted in R. Roberts (1994), pp. 457-490, 1980.

Jao, Y C (1988). *Hong Kong's Banking System in Transition: Problems, Prospects and Policies* (Hong Kong: Chinese Banks' Association), 1988.

Jao, Y C (1997a). Hong Kong as an International Financial Centre: Evolution, 51 Prospects and Policies (Hong Kong: City University of Hong Kong Press).

Jao, Y C (1997b) "Hong Kong as a Financial Centre for Greater China", in J. C.H. Chai, Y. Y. Kueh, and C. A. Tisdell (eds.) China and the Asia Pacific Economy (Commack, N. Y.: Nova Science Publishers), pp. 127-144., 1997.

Jacobs, J (1975) *La economía de las ciudades.* Barcelona: Península, 1975.

Ji, S (2003) *A History of Modern Shanghai Banking: The Rise and Decline of China's Finance Capitalism,* An East Gate Book, 2003.

Johnson, G L (1986), *Research Methodology for Economists; Philosophy and Practice*, New York: Macmillan Publishing Co., 1986.

Jones, G. (1992) "International Financial Centres in Asia, the Middle East and Australia: A Historical Perspective" in Y. Cassis (ed.), *Finance and Financiers in European History 1880-1960,* (Cambridge: Cambridge University Press), pp.405-28, 1992.

Jones, B and Kone, S (1996) "An Exploration of Relationships between Urbanization and Per Capita Income: United States and Countries of the World" *Papers in Regional Science*, 75 (2): 135-153, 1996.

Jones, G. (1992) “International Financial Centres in Asia, the Middle East and Australia: A Historical Perspective” in Y. Cassis (ed.), Finance and Financiers in European History 1880-1960, (Cambridge: Cambridge University Press), pp.405-28, 1992.

Krugman, P (1991) *Geography and trade*. Leuven: Leuven University, 1991a.

Krugman, P (1991) “Increasing returns and economic geography”, *Journal of Political Economic*, v.99, nº3, p.483-499, Jun 1991b.

Kindleberger, C P (1974) *The Formation of Financial Centers: A Study in Comparative Economic History.* Princeton: Princeton University Press, 1974.

Knoke, D and Bohrnstedt, G W (1982) *Statistics for Social Data Analysis*, F.E. Peacock Publishers Inc., 1982.

Lanning, G and Couling, S (1973) *The History of Shanghai*, Cheng Wen, 1973.

Lemelin, A and Polese, M (1995) “What about the Bell-Shaped Relationship Between Primacy and Development?” *International Regional Science Review* 18: 313-330, 1995.

Levine, R (1996) “Stock Markets: A spur to Economic Growth”, *Finance and Development*, pp7-10, March 1996.

Liu, S, Wang, W and Chang, M (1997) *An Outline History of Hong Kong*, Foreign Languages Press, 1997

Loechel, H (2010) *Shanghai Rising – How Shanghai can become a global financial centre*, Business Forum China, 4, 46 – 49, 2010

Losch, A (1954) *The Economics of Location*, Yale University Press, New Haven, 1954.

Losch, A (1964) "The Nature of Economic Regions", *Regional development and planning*: a reader. Cambridge: MIT, 1964.

Lui, A (1990) *Forts and Pirates – A History of Hong Kong*, Hong Kong History Society, 1990.

Mak, S H W (1993) *Hong Kong as a Financial Centre*, London: Whurr Publishers, 1993.

Martin, R and Sunley, P (1996) "Paul Krugman's geographical economics and its implications for regional development theory: a critical assessment", *Economic Geography*, v.72, n.3, p.259-92, Jul 1996.

Martin, R and Sunley, P (1999) "The new economic geography of money" *Money and the space economy.* Londres: Willey, 1999a.

Martin, R. and Sunley, P (1999) "The new 'geographical turn' in economics: some critical reflections", *Cambridge Journal of Economics*, 23, p.65-91, 1999b.

Mathias, P. (1969), *The First Industrial Nation",* Methuen, London, 1969.

McCarthy, I (1979) "Offshore Banking Centers: Benefits and Costs", *Finance and Development*, Vol. 16, No. 4, pp. 45-48, 1979.

Meyer, D R (2000) *Hong Kong as a Global Metropolis*, Cambridge: Cambridge University Press, 2000.

McCann, P (1999) "A note on the meaning of neo-classical location theory and its usefulness as a basis for applied research" *Papers in Regional Science*, 78, p.323-331, 1999.

McGahey, R, Malloy, M, Kazanas, K and Jacob M P (1990) "What Makes a Financial Center?" in Financial Services, Financial Centers, Boulder, Colorado: Westview Press, pp. 15-76, 1990.

McKinnon, R (1973) *Money and Capital in Economic Development*. New York :Oxford University Press, 1973.

McKinnon, R (1988) "Financial Liberalization in Retrospect; Interest Rate Policies in L.D.Cs" *The State of Development Economics,* edited By G. Ranis and P.Schultz, Oxford:Basil Blackwell, 346-400, 1988.

Mehrans, H and Laurens, B (1997) “Interest Rates: An approach to Liberalisation. *Finance and Development,* Vol 34, No 2, 1997.

Mills, E S (1972) *Urban Economics,* Scott Foreman, Glenview, Illinois 1972.

Myrdal, G (1957) *Economic theory and underdevelopment regions.* London: Gerald Duckworth, 1957.

Pakhomov (2011) “Development of Moscow as International Financial Centre”, State Debt Committee of the City of Moscow, 2011.

Pagano M, Panetta F, Zingales L (1998) “Why do firms go public? An empirical analysis”, *Journal of Finance* 53, 27-64, 1988.

Park, Y S (1982) “The Economics of Offshore Financial Centres”, *Columbia Journal of World Business*, Vol. 17, No. 4 (Winter), pp. 1-5, 1982.

Parr, J (2002) “The location of economic activity: central place theory and the wider urban system”, *Industrial Location Economics*, pp.32-82, 2002a.

Parr, J (2002) “Missing elements in the analysis of agglomeration economies” *International Regional Science Review*, 25, 2:151-68, April 2002b.

Plummer, M (2009) “The Global Economic Crisis and Its Implication for Asian Economic Cooperation”, *Policy Studies 55*, East and West Studies, 2009

Reed, H C (1981) *The Pre-eminence of International Financial Centres,* New York: Pradeger Publishers, 1981.

Reed, H C (1983) "Appraising Corporate Investment Policy: A Financial Center Theory of Foreign Direct Investment", C. P. Kindleberger and D. B., 1983.

Richardson, H W (1978) *Regional and Urban Economics,* Penguin, Harmondsworth, 1978.

Roberts, R (1994) *International Financial Centers, Vol.1, Concepts, Development and Dynamics,* Hants, England: Edward Elgar, 1994.

Rosenthal, S R and Strange, W C (2001) "The Determinants of Agglomeration", *Journal of Urban Economics*, 50: 191-229, 2001.

Schenk, C R (2001) *Hong Kong as an International Financial Centre: Emergence and Development, 1945-65,* London: Routledge, 2001..

Shanghai Daily, newspaper issued on 26 March 2009

Shanghai Financial Service Office 9 (2009), 93 initiatives plan, Shanghai, 2009

Shaw, E S (1973) *Financial Deepening on Economic Development,* New York. Washington, DC: Brookings Institution, 1973.

Singh, A (1997) “Financial Liberalisation, Stock Markets and Economic Development*”, The Economic Journal. Royal Economic Society,* p771-782, May 1997.

Smith, A (1776) “An Inquiry into the Nature and Causes of the Wealth of Nations”. London: Methuen and Co., Ltd., 1776.

Stiglitz, J E (1999) ”Lessons from East Asia”, *Journal of Policy Modelling* vol. 21. Part 3 p331-320, 1999.

Stiglitz, J E and Weiss, A (1981) “Credit Rationing In markets with Imperfect Information”, *American Economic Review*, 71 (3 June): p393-410, 1981.

Stiglitz, J E (1990) ”Reforming the Global Architecture. Lessons from Recent Crises, *Journal of Finance* Vol. 54 Cambridge, p1508-1521, August 1999.

Stiglitz, J E, Jaramillo-Valejo, J and Yung C P (1993) “The Role of State in Financial Markets”. Annual World Bank Conference on Development Economics. *The World Bank Research Observer*. p303-331, 1993.

Taylor, M and Fleming, A (1999) “Integrated Financial Supervision. Lessons of Scandinavia, 1999.

Tolley, G S and Thomas, V (eds) (1987) *The Economics of Urbanization and Urban Policies in Developing Nations.* The World Bank, Washington, D.C., 1987.

"Work Life Balance in Hong Kong Survey Result", The University of Hong Kong, 8 April 2008

Wasserstorm, J (2009), *Global Shanghai, 1850 – 2010: A History of Fragments,* Routledge, 2009

Weber, A (1969) *Theory of the location of industries,* Chicago University Press, 1969.

Wood G and Parr, J (2005), "Transaction costs, agglomeration economies and industrial location" *Growth and Change*, 36, No. 1, p.1-15, Winter 2005.

Appendix A: The Questionnaire

24 February 2005

Dear Sir / Madam:

I am a PhD candidate of Napier University in the United Kingdom. I am currently conducting a study, as part of my PhD thesis, on the comparison of key success factors between Hong Kong and Shanghai as an international financial center and how they are seen in terms of future development. .

I would very much appreciate if you could spare a few minutes to complete the enclosed questionnaire and return it to myself (Attn: Mr. Andrew Wong) at P.O. Box 71145, Kowloon Central Post Office, Kowloon, Hong Kong on or before 5 March 2005 for further analysis. I have also enclosed for you a pre-paid envelope for your kind action. Should you have any questions, please feel free to contact me either by phone at (852) 9480 3691 or by emailing at ywongy@netvigator.com Thank you very much for your kind help.

Yours truly,

Andrew Wong

A STUDY OF SUCCESS FACTORS FOR HONG KONG AND SHANGHAI AS INTERNATIONAL FINANCIAL CENTERS

This research focuses on the key success factors contributing Hong Kong and Shanghai in becoming international financial centers. The objective is to analyze what makes Hong Kong and Shanghai international financial centers and predict how Hong Kong and Shanghai will stand as international financial centers in the coming years. This study represents part of the PhD thesis of the programme offered by Napier University in the United Kingdom.

Question 1

How do you weigh the importance of the following factors as criteria for a city to develop itself into an international financial center?

[Please indicate by putting a tick in <u>each</u> box to indicate whether you consider the factor is: VI (Very Important); QI (Quite Important); SI (Sometimes Important); (NI) Not Important; or IRR (Irrelevant)]

	VI	QI	SI	NI	IRR
Proximity to manufacturing / production site					
Transportation network (such as intercity highway, railway, sea-route, etc.)					
Time zone					
Quality of labor and labor supply					
Infrastructure (such as settlement and payment structure, telecommunication, etc.)					
Political stability					
Regulation and Prudential Supervision of financial market					
Legal system, accounting system, corporate governance					
Openness to foreign markets and investors					
Cost of production (such as rental expense, wages, etc.)					
Government policy and support					
Economic growth					
Inflation					

Stability of currency					
Others (please specified: _____					

_____

_____)

Question 2

How do you evaluate Hong Kong and Shanghai regarding their geographic location? ("1" = totally disagree, "2" = disagree, "3" = neutral, "4" = agree, "5" = totally agree)

About accessibility and geographic location	Hong Kong	Shanghai
2.1 The city is close to major manufacturing / production sites		
2.2 The city situates at good time zone for international business?		
2.3 The city can be easily accessed by various kind of domestic / international transportation network (such as intercity highways, railway, sea-route, airways, etc.)?		

Question 3

How do you evaluate Hong Kong and Shanghai regarding their human resources? ("1" = totally disagree, "2" = disagree, "3" = neutral, "4" = agree, "5" = totally agree)

About human resources	Hong Kong	Shanghai
3.1 There is large supply of skilled human resources		
3.2 Human resource has good language skills		
3.3 Cost of human resource is low		
3.4 Human resource is of high educational level		
3.5 Human resource is highly adaptable to changes		
3.6 Employees work long hours		
3.7 The city has good quality of labor		

Question 4

How do you evaluate the economic environment of Hong Kong and Shanghai?

("1" = totally disagree, "2" = disagree, "3" = neutral, "4" = agree, "5" = totally agree)

Economic environment	Hong Kong	Shanghai
4.1 Strong economic growth		
4.2 Low inflation		
4.3 Low unemployment		
4.4 Open market for foreign exchange and stable exchange rate		
4.5 Low cost of properties		

Question 5

How do you evaluate the political environment and government support in assisting the development of Hong Kong and Shanghai as an international financial center?

("1" = totally disagree, "2" = disagree, "3" = neutral, "4" = agree, "5" = totally agree)

Political stability and Government support	Hong Kong	Shanghai
5.1 There is a stable political environment		
5.2 Government is active in promoting the city as an international financial center		
5.3 There exists a low tax rate environment		

Question 6

How do you evaluate the infrastructure of Hong Kong and Shanghai in relation to supporting Hong Kong and Shanghai as international financial centers? ("1" = totally disagree, "2" = disagree, "3" = neutral, "4" = agree, "5" = totally agree)

Infrastructure	Hong Kong	Shanghai
6.1 Good telecommunication network		
6.2 Efficient settlement and payment system		
6.3 Effective legal system, accounting system, and corporate governance		

Question 7

How do you evaluate the effectiveness of regulation and prudential supervision on the financial market in Hong Kong and Shanghai? ("1" = totally disagree, "2" = disagree, "3" = neutral, "4" = agree, "5" = totally agree)

Regulation and Prudential Supervision	Hong Kong	Shanghai
7.1 Comprehensive rules and regulation on financial market		
7.2 Effective prudential supervision of financial market		

Question 8

How do you foresee and evaluate the future performance of Hong Kong and Shanghai with respect to captioned success factors five years from now? ("1" = very poor, "2" = poor, "3" = neutral, "4" = good, "5" = very good)

Success Factors	Hong Kong	Shanghai
Proximity to manufacturing / production site		
Transportation network		
Quality of labor and labor supply		
Infrastructure (such as settlement and payment structure, telecommunication, etc.)		
Political stability		
Regulation and Prudential Supervision on financial market		
Legal system, accounting system, corporate governance		
Openness to foreign markets and investors		
Cost of production (such as rental expense, wages, etc.)		
Government policy and support		
Economic growth		
Inflation		
Stability of currency		
Others (please specified: _____)		

Question 9

In your views, what are the key threats to the performance / prospects of the two cities as international financial centers over the next 5 years?

_____
_____
_____
_____
_____

Question 10

Should you have any other comments, please write them down below. Your comments are extremely valuable to us.

_____
_____
_____
_____
_____
_____

***** Thank you for your kind co-operation in answering this questionnaire. *****

Appendix B: Data Output

Data Output for Q1

Analysis 1-1

The MEANS Procedure

Variable	N	Mean	Std Dev	Minimum	Maximum
Obs	376	188.5000000	108.6860923	1.0000000	376.0000000
A1	376	2.9175532	1.1200526	1.0000000	5.0000000
A2	376	3.8670213	0.9343105	1.0000000	5.0000000
A3	376	2.7393617	0.9010475	1.0000000	5.0000000
A4	376	4.4122340	0.7985048	1.0000000	5.0000000
A5	376	4.5797872	0.7332237	1.0000000	5.0000000
A6	376	4.6728723	0.6904362	1.0000000	5.0000000
A7	376	4.5558511	0.8806469	1.0000000	5.0000000
A8	376	4.5186170	0.6650708	1.0000000	5.0000000
A9	376	4.4840426	0.7227803	1.0000000	5.0000000
A10	376	3.2606383	0.8492466	1.0000000	5.0000000
A11	376	4.0292553	0.8527261	1.0000000	5.0000000
A12	376	3.7287234	0.6456620	1.0000000	5.0000000
A13	376	3.3031915	0.8995349	1.0000000	5.0000000
A14	376	4.0984043	0.9112029	1.0000000	5.0000000

Analysis 1-2

The TTEST Procedure

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
A1	HK	196	3.1313	3.3112	3.4911	1.1619	1.277	1.4177	0.0912
A1	SH	180	2.3852	2.4889	2.5926	0.639	0.705	0.7865	0.0526
A1	Diff (1-2)		0.6106	0.8223	1.0341	0.9735	1.0432	1.1237	0.1077
A2	HK	196	3.8149	3.9235	4.0321	0.7013	0.7708	0.8557	0.0551
A2	SH	180	3.6462	3.8056	3.9649	0.9821	1.0836	1.2088	0.0808
A2	Diff (1-2)		-0.072	0.1179	0.3074	0.8713	0.9337	1.0058	0.0964
A3	HK	196	2.4367	2.5612	2.6857	0.804	0.8837	0.981	0.0631
A3	SH	180	2.8036	2.9333	3.063	0.7992	0.8818	0.9837	0.0657
A3	Diff (1-2)		-0.551	-0.372	-0.193	0.8238	0.8828	0.9509	0.0911
A4	HK	196	3.938	4.0612	4.1845	0.796	0.8749	0.9713	0.0625
A4	SH	180	4.7254	4.7944	4.8634	0.4252	0.4691	0.5233	0.035
A4	Diff (1-2)		-0.877	-0.733	-0.589	0.6628	0.7102	0.7651	0.0733
A5	HK	196	4.6682	4.7551	4.842	0.5614	0.617	0.685	0.0441
A5	SH	180	4.2711	4.3889	4.5067	0.7257	0.8008	0.8933	0.0597
A5	Diff (1-2)		0.2219	0.3662	0.5105	0.6634	0.7109	0.7658	0.0734
A6	HK	196	4.6218	4.7194	4.817	0.6302	0.6927	0.769	0.0495
A6	SH	180	4.5213	4.6222	4.7232	0.622	0.6863	0.7656	0.0512
A6	Diff (1-2)		-0.043	0.0972	0.2372	0.6436	0.6896	0.7429	0.0712
A7	HK	196	4.2701	4.4133	4.5565	0.9249	1.0166	1.1286	0.0726
A7	SH	180	4.6122	4.7111	4.81	0.6096	0.6726	0.7503	0.0501
A7	Diff (1-2)		-0.474	-0.298	-0.121	0.811	0.8691	0.9362	0.0897
A8	HK	196	4.4315	4.5255	4.6195	0.6073	0.6675	0.741	0.0477
A8	SH	180	4.4134	4.5111	4.6088	0.602	0.6642	0.741	0.0495
A8	Diff (1-2)		-0.121	0.0144	0.1496	0.6214	0.6659	0.7173	0.0687
A9	HK	196	4.3874	4.4898	4.5922	0.6612	0.7267	0.8068	0.0519
A9	SH	180	4.3718	4.4778	4.5837	0.6529	0.7205	0.8037	0.0537
A9	Diff (1-2)		-0.135	0.012	0.1589	0.6754	0.7237	0.7796	0.0747
A10	HK	196	3.3658	3.4898	3.6138	0.8006	0.8799	0.9768	0.0629
A10	SH	180	2.9023	3.0111	3.1199	0.6705	0.7398	0.8253	0.0551
A10	Diff (1-2)		0.3131	0.4787	0.6443	0.7614	0.8159	0.8789	0.0842
A11	HK	196	3.8117	3.9337	4.0556	0.7876	0.8657	0.9611	0.0618
A11	SH	180	4.0115	4.1333	4.2552	0.7506	0.8283	0.924	0.0617
A11	Diff (1-2)		-0.372	-0.2	-0.028	0.7913	0.848	0.9135	0.0875
A12	HK	196	3.8379	3.9337	4.0295	0.6186	0.6799	0.7548	0.0486
A12	SH	180	3.4286	3.5056	3.5825	0.4741	0.5232	0.5836	0.039
A12	Diff (1-2)		0.3043	0.4281	0.5519	0.5692	0.6099	0.657	0.063
A13	HK	196	3.3135	3.449	3.5845	0.8753	0.9621	1.0681	0.0687
A13	SH	180	3.0269	3.1444	3.2619	0.724	0.7989	0.8912	0.0595
A13	Diff (1-2)		0.1243	0.3045	0.4847	0.8284	0.8877	0.9563	0.0916
A14	HK	196	4.1835	4.3061	4.4287	0.7917	0.8701	0.966	0.0622
A14	SH	180	3.7394	3.8722	4.0051	0.8186	0.9033	1.0077	0.0673
A14	Diff (1-2)		0.254	0.4339	0.6138	0.827	0.8862	0.9546	0.0915

Analysis 1-3

The TTEST Procedure

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
A1	Pooled	Equal	374	7.64	<.0001
A1	Satterthwaite	Unequal	309	7.81	<.0001
A2	Pooled	Equal	374	1.22	0.2220
A2	Satterthwaite	Unequal	320	1.21	0.2286
A3	Pooled	Equal	374	-4.08	<.0001
A3	Satterthwaite	Unequal	371	-4.08	<.0001
A4	Pooled	Equal	374	-10.00	<.0001
A4	Satterthwaite	Unequal	304	-10.24	<.0001
A5	Pooled	Equal	374	4.99	<.0001
A5	Satterthwaite	Unequal	336	4.94	<.0001
A6	Pooled	Equal	374	1.36	0.1731
A6	Satterthwaite	Unequal	372	1.37	0.1730
A7	Pooled	Equal	374	-3.32	0.0010
A7	Satterthwaite	Unequal	341	-3.38	0.0008
A8	Pooled	Equal	374	0.21	0.8342
A8	Satterthwaite	Unequal	372	0.21	0.8342
A9	Pooled	Equal	374	0.16	0.8723
A9	Satterthwaite	Unequal	372	0.16	0.8722
A10	Pooled	Equal	374	5.68	<.0001
A10	Satterthwaite	Unequal	371	5.72	<.0001
A11	Pooled	Equal	374	-2.28	0.0231
A11	Satterthwaite	Unequal	373	-2.29	0.0229
A12	Pooled	Equal	374	6.80	<.0001
A12	Satterthwaite	Unequal	363	6.87	<.0001
A13	Pooled	Equal	374	3.32	0.0010
A13	Satterthwaite	Unequal	370	3.35	0.0009
A14	Pooled	Equal	374	4.74	<.0001
A14	Satterthwaite	Unequal	368	4.74	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
A1	Folded F	195	179	3.28	<.0001
A2	Folded F	179	195	1.98	<.0001
A3	Folded F	195	179	1.00	0.9794
A4	Folded F	195	179	3.48	<.0001
A5	Folded F	179	195	1.68	0.0004
A6	Folded F	195	179	1.02	0.9010
A7	Folded F	195	179	2.28	<.0001
A8	Folded F	195	179	1.01	0.9491
A9	Folded F	195	179	1.02	0.9079
A10	Folded F	195	179	1.41	0.0187
A11	Folded F	195	179	1.09	0.5483
A12	Folded F	195	179	1.69	0.0004
A13	Folded F	195	179	1.45	0.0117
A14	Folded F	179	195	1.08	0.6077

Analysis 1-4

The CORR Procedure

2 Variables: HK SH

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK	14	3.99089	0.61980	55.87245	2.56122	4.75510
SH	14	3.88571	0.75597	54.40000	2.48889	4.79444

Pearson Correlation Coefficients, N = 14

Prob > |r| under H0: Rho=0

	HK	SH
HK	1.00000	0.84106 0.0002
SH	0.84106 0.0002	1.00000

Analysis 1-5

The CORR Procedure

2 Variables: HK SH

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
HK	14	3.99089	0.61980	3.99745	2.56122	4.75510
SH	14	3.88571	0.75597	4.00278	2.48889	4.79444

Spearman Correlation Coefficients, N = 14

Prob > |r| under H0: Rho=0

	HK	SH
HK	1.00000	0.80968 0.0004
SH	0.80968 0.0004	1.00000

Analysis 1-6

The CORR Procedure

2 Variables: HK SH

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK	14	4.14286	0.94926	58.00000	2.00000	5.00000
SH	14	4.07143	0.99725	57.00000	2.00000	5.00000

Pearson Correlation Coefficients, N = 14

Prob > |r| under H0: Rho=0

	HK	SH
HK	1.00000	0.71971 0.0037
SH	0.71971 0.0037	1.00000

Analysis 1-7

The CORR Procedure

2 Variables: HK SH

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
HK	14	4.14286	0.94926	4.00000	2.00000	5.00000
SH	14	4.07143	0.99725	4.00000	2.00000	5.00000

Spearman Correlation Coefficients, N = 14

Prob > |r| under H0: Rho=0

	HK	SH
HK	1.00000	0.78761 0.0008
SH	0.78761 0.0008	1.00000

Analysis 1-8

Obs	_NAME_	HK	SH
1	M3	2	3
2	M10	3	3
3	M13	3	3
4	M1	4	2
5	M11	4	4
6	M12	4	4
7	M2	4	4
8	M4	4	5
9	M14	5	4
10	M5	5	5
11	M6	5	5
12	M7	5	5
13	M8	5	5
14	M9	5	5

Analysis 1-9

The PRINCOMP Procedure

Observations 376
Variables 14

Simple Statistics

	A1	A2	A3	A4	A5
Mean	2.917553191	3.867021277	2.739361702	4.412234043	4.579787234
StD	1.120052557	0.934310532	0.901047460	0.798504808	0.733223718

Simple Statistics

	A6	A7	A8	A9	A10
Mean	4.672872340	4.555851064	4.518617021	4.484042553	3.260638298
StD	0.690436187	0.880646925	0.665070785	0.722780290	0.849246642

Simple Statistics

	A11	A12	A13	A14
Mean	4.029255319	3.728723404	3.303191489	4.098404255
StD	0.852726125	0.645662011	0.899534947	0.911202930

Correlation Matrix

	A1	A2	A3	A4	A5	A6	A7
A1	1.0000	0.3615	-.1772	-.1676	-.0163	-.1729	-.2778
A2	0.3615	1.0000	0.0442	0.0737	-.0312	-.0428	-.0882
A3	-.1772	0.0442	1.0000	0.1905	-.0613	-.0817	0.2133
A4	-.1676	0.0737	0.1905	1.0000	0.0279	0.0179	0.2080
A5	-.0163	-.0312	-.0613	0.0279	1.0000	0.3282	0.0860
A6	-.1729	-.0428	-.0817	0.0179	0.3282	1.0000	0.3832
A7	-.2778	-.0882	0.2133	0.2080	0.0860	0.3832	1.0000
A8	-.0248	-.1162	0.1060	-.1024	0.0872	0.2891	0.3351
A9	-.1021	-.1295	0.0960	0.0230	0.0980	0.3609	0.6948
A10	0.3451	-.0738	-.0469	-.2690	0.0436	-.0361	-.1800
A11	-.0645	-.0754	-.0005	0.0175	0.2074	0.2020	0.3050
A12	0.1755	0.0815	-.0714	-.1549	0.2261	0.0935	0.0595
A13	0.1519	0.2163	-.0898	-.2524	-.0166	0.0700	-.0450
A14	0.0733	0.1156	-.0271	-.1952	0.0740	0.1361	0.1776

Correlation Matrix

	A8	A9	A10	A11	A12	A13	A14
A1	-.0248	-.1021	0.3451	-.0645	0.1755	0.1519	0.0733
A2	-.1162	-.1295	-.0738	-.0754	0.0815	0.2163	0.1156
A3	0.1060	0.0960	-.0469	-.0005	-.0714	-.0898	-.0271

Analysis 1-10

The PRINCOMP Procedure

Correlation Matrix

	A8	A9	A10	A11	A12	A13	A14
A4	-.1024	0.0230	-.2690	0.0175	-.1549	-.2524	-.1952
A5	0.0872	0.0980	0.0436	0.2074	0.2261	-.0166	0.0740
A6	0.2891	0.3609	-.0361	0.2020	0.0935	0.0700	0.1361
A7	0.3351	0.6948	-.1800	0.3050	0.0595	-.0450	0.1776
A8	1.0000	0.4028	0.2133	0.1236	0.0615	0.0931	0.0652
A9	0.4028	1.0000	-.0714	0.2582	0.0821	0.0608	0.1623
A10	0.2133	-.0714	1.0000	0.2730	0.3433	0.1546	0.1563
A11	0.1236	0.2582	0.2730	1.0000	0.4940	0.3048	0.2743
A12	0.0615	0.0821	0.3433	0.4940	1.0000	0.3670	0.2948
A13	0.0931	0.0608	0.1546	0.3048	0.3670	1.0000	0.4060
A14	0.0652	0.1623	0.1563	0.2743	0.2948	0.4060	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.82050331	0.41488887	0.2015	0.2015
2	2.40561444	1.08978464	0.1718	0.3733
3	1.31582980	0.11074724	0.0940	0.4673
4	1.20508255	0.09125033	0.0861	0.5534
5	1.11383222	0.04377239	0.0796	0.6329
6	1.07005984	0.25819327	0.0764	0.7094
7	0.81186657	0.13774761	0.0580	0.7673
8	0.67411895	0.06439620	0.0482	0.8155
9	0.60972276	0.07951255	0.0436	0.8590
10	0.53021021	0.07553491	0.0379	0.8969
11	0.45467529	0.02958585	0.0325	0.9294
12	0.42508945	0.10068664	0.0304	0.9598
13	0.32440280	0.08541099	0.0232	0.9829
14	0.23899182		0.0171	1.0000

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
A1	-.050267	0.403289	0.116040	0.159632	-.293639	0.447629	-.279711
A2	-.051980	0.204710	0.647826	-.000592	-.312948	0.240186	0.088795
A3	0.025924	-.211915	0.291938	0.327655	0.457454	0.263903	0.576161
A4	-.066223	-.315056	0.364134	-.269216	0.219184	0.321326	-.295515
A5	0.213422	-.004427	-.138640	-.585938	-.143049	0.317834	0.419130
A6	0.340814	-.167530	-.083941	-.248629	-.401591	0.020932	0.177999
A7	0.383095	-.361111	0.173974	0.123455	-.018939	-.002569	-.217559
A8	0.310501	-.099496	-.235987	0.425114	-.191458	0.270005	0.165692
A9	0.400406	-.257606	0.037303	0.236071	-.178603	0.010680	-.288117
A10	0.147666	0.366448	-.338506	0.197897	0.236469	0.362830	-.026198
A11	0.399378	0.109553	0.029740	-.209217	0.418079	-.006505	-.255379

Analysis 1-11

The PRINCOMP Procedure

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
A12	0.314597	0.324376	0.047586	-.209893	0.275864	0.087239	-.093677
A13	0.237382	0.342559	0.248803	0.085234	-.028893	-.350092	0.129710
A14	0.296450	0.218366	0.236181	0.059959	-.015428	-.364282	0.194758

Eigenvectors

	Prin8	Prin9	Prin10	Prin11	Prin12	Prin13	Prin14
A1	-.256464	-.041659	0.062052	0.297842	0.232587	-.441172	0.149170
A2	0.138394	-.063022	-.215072	-.230312	-.425638	0.235580	-.114510
A3	-.097639	-.128412	-.172311	0.211281	0.163804	-.146233	-.048931
A4	0.207385	0.466480	0.322268	0.008078	0.271184	0.085819	-.084987
A5	-.246669	-.179656	0.377209	0.135646	-.127718	0.138008	0.074623
A6	0.251813	0.288062	-.570843	0.145378	0.268939	-.159132	-.049830
A7	-.196226	-.072489	-.083174	-.081785	-.086538	0.123636	0.741277
A8	0.376679	0.097791	0.391510	-.369632	-.131749	-.244536	-.041852
A9	-.229518	-.277141	0.066779	0.218790	0.094251	0.301805	-.565141
A10	-.026629	0.375795	-.202201	0.118387	-.076234	0.542690	0.068957
A11	0.148276	-.015752	-.091044	0.230859	-.530305	-.401853	-.131380
A12	0.037957	-.342214	-.122076	-.557839	0.458440	0.003913	-.046715
A13	0.469840	-.095197	0.306911	0.413331	0.211233	0.199272	0.194253
A14	-.510217	0.534487	0.158962	-.182985	0.013099	-.121897	-.120030

Analysis 1-12

The TTEST Procedure

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
Prin1	HK	196	-0.009	0.1325	0.274	0.9141	1.0047	1.1154	0.0718
Prin1	SH	180	-0.288	-0.144	-55E-5	0.8857	0.9773	1.0902	0.0728
Prin1	Diff (1-2)		0.0755	0.2768	0.4781	0.9254	0.9917	1.0682	0.1024
Prin2	HK	196	0.2868	0.4335	0.5803	0.9477	1.0416	1.1563	0.0744
Prin2	SH	180	-0.574	-0.472	-0.37	0.63	0.6951	0.7754	0.0518
Prin2	Diff (1-2)		0.7244	0.9056	1.0868	0.8331	0.8927	0.9616	0.0922
Prin3	HK	196	-0.301	-0.168	-0.034	0.8613	0.9466	1.0509	0.0676
Prin3	SH	180	0.0316	0.1826	0.3337	0.9306	1.0269	1.1455	0.0765
Prin3	Diff (1-2)		-0.55	-0.35	-0.15	0.92	0.9858	1.0619	0.1018
Prin4	HK	196	-0.171	-0.021	0.1289	0.9694	1.0654	1.1828	0.0761
Prin4	SH	180	-0.113	0.023	0.1592	0.8391	0.9259	1.0329	0.069
Prin4	Diff (1-2)		-0.247	-0.044	0.1591	0.9342	1.0011	1.0784	0.1033
Prin5	HK	196	-0.4	-0.26	-0.12	0.9036	0.9932	1.1026	0.0709
Prin5	SH	180	0.146	0.2829	0.4198	0.8434	0.9306	1.0381	0.0694
Prin5	Diff (1-2)		-0.738	-0.543	-0.347	0.8993	0.9637	1.0381	0.0995
Prin6	HK	196	-0.105	0.0441	0.1936	0.965	1.0606	1.1774	0.0758
Prin6	SH	180	-0.185	-0.048	0.0887	0.8429	0.9301	1.0376	0.0693
Prin6	Diff (1-2)		-0.111	0.0922	0.2953	0.9334	1.0003	1.0775	0.1033

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
Prin1	Pooled	Equal	374	2.70	0.0072
Prin1	Satterthwaite	Unequal	373	2.71	0.0071
Prin2	Pooled	Equal	374	9.83	<.0001
Prin2	Satterthwaite	Unequal	342	9.99	<.0001
Prin3	Pooled	Equal	374	-3.44	0.0006
Prin3	Satterthwaite	Unequal	364	-3.43	0.0007
Prin4	Pooled	Equal	374	-0.43	0.6694
Prin4	Satterthwaite	Unequal	373	-0.43	0.6675
Prin5	Pooled	Equal	374	-5.45	<.0001
Prin5	Satterthwaite	Unequal	374	-5.47	<.0001
Prin6	Pooled	Equal	374	0.89	0.3724
Prin6	Satterthwaite	Unequal	373	0.90	0.3697

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
Prin1	Folded F	195	179	1.06	0.7072
Prin2	Folded F	195	179	2.25	<.0001
Prin3	Folded F	179	195	1.18	0.2659
Prin4	Folded F	195	179	1.32	0.0567
Prin5	Folded F	195	179	1.14	0.3761
Prin6	Folded F	195	179	1.30	0.0745

Data Output for Q2

Analysis 2-1

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	188.5000000	33.63	<.0001	1.0000000	376.0000000	188.5000000
H1	3.1515957	68.51	<.0001	1.0000000	5.0000000	3.0000000
S1	3.6542553	75.64	<.0001	1.0000000	5.0000000	4.0000000
H2	3.2978723	73.92	<.0001	1.0000000	5.0000000	3.0000000
S2	3.2978723	82.62	<.0001	1.0000000	5.0000000	3.0000000
H3	4.2606383	92.61	<.0001	1.0000000	5.0000000	4.0000000
S3	4.0824468	114.12	<.0001	1.0000000	5.0000000	4.0000000

Analysis 2-2

Sample=HK

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	98.5000000	24.31	<.0001	1.0000000	196.0000000	98.5000000
H1	3.1785714	47.28	<.0001	1.0000000	5.0000000	3.0000000
S1	3.5969388	45.86	<.0001	1.0000000	5.0000000	3.0000000
H2	3.1632653	64.20	<.0001	1.0000000	5.0000000	3.0000000
S2	3.1479592	63.92	<.0001	1.0000000	5.0000000	3.0000000
H3	4.5816327	90.62	<.0001	1.0000000	5.0000000	5.0000000
S3	4.1428571	79.42	<.0001	1.0000000	5.0000000	4.0000000

Sample=SH

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	286.5000000	73.77	<.0001	197.0000000	376.0000000	286.5000000
H1	3.1222222	50.06	<.0001	1.0000000	4.0000000	3.0000000
S1	3.7166667	69.35	<.0001	2.0000000	5.0000000	4.0000000
H2	3.4444444	46.03	<.0001	1.0000000	5.0000000	3.0000000
S2	3.4611111	56.08	<.0001	2.0000000	5.0000000	4.0000000
H3	3.9111111	55.75	<.0001	2.0000000	5.0000000	4.0000000
S3	4.0166667	83.28	<.0001	1.0000000	5.0000000	4.0000000

Analysis 2-3

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
H1	HK	196	3.046	3.1786	3.3112	0.8564	0.9412	1.0449	0.0672
H1	SH	180	2.9992	3.1222	3.2453	0.7583	0.8367	0.9334	0.0624
H1	Diff (1-2)		-0.125	0.0563	0.2376	0.8331	0.8927	0.9616	0.0922
S1	HK	196	3.4422	3.5969	3.7516	0.9991	1.0982	1.2191	0.0784
S1	SH	180	3.6109	3.7167	3.8224	0.6517	0.7191	0.8021	0.0536
S1	Diff (1-2)		-0.31	-0.12	0.0703	0.8735	0.9361	1.0083	0.0966
H2	HK	196	3.0661	3.1633	3.2604	0.6276	0.6898	0.7657	0.0493
H2	SH	180	3.2968	3.4444	3.5921	0.9099	1.004	1.12	0.0748
H2	Diff (1-2)		-0.455	-0.281	-0.108	0.7976	0.8547	0.9207	0.0882
S2	HK	196	3.0508	3.148	3.2451	0.6273	0.6895	0.7655	0.0493
S2	SH	180	3.3393	3.4611	3.5829	0.7504	0.828	0.9237	0.0617
S2	Diff (1-2)		-0.467	-0.313	-0.159	0.7083	0.759	0.8176	0.0784
H3	HK	196	4.4819	4.5816	4.6813	0.644	0.7078	0.7858	0.0506
H3	SH	180	3.7727	3.9111	4.0495	0.853	0.9412	1.05	0.0702
H3	Diff (1-2)		0.5025	0.6705	0.8386	0.7725	0.8278	0.8917	0.0855
S3	HK	196	4.04	4.1429	4.2457	0.6644	0.7303	0.8107	0.0522
S3	SH	180	3.9215	4.0167	4.1118	0.5864	0.6471	0.7218	0.0482
S3	Diff (1-2)		-0.014	0.1262	0.2666	0.6455	0.6917	0.7451	0.0714

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
H1	Pooled	Equal	374	0.61	0.5413
H1	Satterthwaite	Unequal	374	0.61	0.5393
S1	Pooled	Equal	374	-1.24	0.2161
S1	Satterthwaite	Unequal	339	-1.26	0.2084
H2	Pooled	Equal	374	-3.19	0.0016
H2	Satterthwaite	Unequal	314	-3.14	0.0019
S2	Pooled	Equal	374	-4.00	<.0001
S2	Satterthwaite	Unequal	349	-3.97	<.0001
H3	Pooled	Equal	374	7.85	<.0001
H3	Satterthwaite	Unequal	331	7.75	<.0001
S3	Pooled	Equal	374	1.77	0.0780
S3	Satterthwaite	Unequal	374	1.78	0.0765

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
H1	Folded F	195	179	1.27	0.1097
S1	Folded F	195	179	2.33	<.0001
H2	Folded F	179	195	2.12	<.0001
S2	Folded F	179	195	1.44	0.0124
H3	Folded F	179	195	1.77	<.0001
S3	Folded F	195	179	1.27	0.1002

Analysis 2-4

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
D1	-0.5026596	-10.30	<.0001	-3.0000000	2.0000000	0
D2	0	0.00	1.0000	-2.0000000	2.0000000	0
D3	0.1781915	3.42	0.0007	-2.0000000	4.0000000	0

Analysis 2-5

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
D1	HK	196	-0.571	-0.418	-0.265	0.9875	1.0853	1.2049	0.0775
D1	SH	180	-0.706	-0.594	-0.483	0.6888	0.76	0.8478	0.0566
D1	Diff (1-2)		-0.015	0.1761	0.3676	0.8807	0.9437	1.0166	0.0974
D2	HK	196	-0.015	0.0153	0.0455	0.195	0.2143	0.2379	0.0153
D2	SH	180	-0.118	-0.017	0.0847	0.6243	0.6889	0.7685	0.0513
D2	Diff (1-2)		-0.07	0.032	0.1337	0.4676	0.5011	0.5398	0.0517
D3	HK	196	0.3281	0.4388	0.5494	0.7145	0.7853	0.8718	0.0561
D3	SH	180	-0.274	-0.106	0.063	1.0384	1.1458	1.2781	0.0854
D3	Diff (1-2)		0.3465	0.5443	0.7422	0.9095	0.9746	1.0499	0.1006

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
D1	Pooled	Equal	374	1.81	0.0715
D1	Satterthwaite	Unequal	350	1.83	0.0675
D2	Pooled	Equal	374	0.62	0.5369
D2	Satterthwaite	Unequal	211	0.60	0.5513
D3	Pooled	Equal	374	5.41	<.0001
D3	Satterthwaite	Unequal	313	5.33	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
D1	Folded F	195	179	2.04	<.0001
D2	Folded F	179	195	10.34	<.0001
D3	Folded F	179	195	2.13	<.0001

Analysis 2-6

The PRINCOMP Procedure

Observations 196
Variables 3

Simple Statistics

	H1	H2	H3
Mean	3.178571429	3.163265306	4.581632653
StD	0.941221247	0.689762167	0.707809469

Correlation Matrix

	H1	H2	H3
H1	1.0000	-.2189	-.1105
H2	-.2189	1.0000	0.1511
H3	-.1105	0.1511	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.32479568	0.42507766	0.4416	0.4416
2	0.89971802	0.12423171	0.2999	0.7415
3	0.77548631		0.2585	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
H1	-.594958	0.492000	0.635579
H2	0.632045	-.202119	0.748109
H3	0.496532	0.846808	-.190714

Analysis 2-7

The PRINCOMP Procedure

Observations 196
Variables 3

Simple Statistics

	S1	S2	S3
Mean	3.596938776	3.147959184	4.142857143
StD	1.098152676	0.689515563	0.730296743

Correlation Matrix

	S1	S2	S3
S1	1.0000	-.0427	-.0749
S2	-.0427	1.0000	0.1717
S3	-.0749	0.1717	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.20556733	0.23612422	0.4019	0.4019
2	0.96944310	0.14445353	0.3231	0.7250
3	0.82498957		0.2750	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
S1	-.377200	0.914704	0.145040
S2	0.638597	0.370306	-.674587
S3	0.670756	0.161832	0.723807

Analysis 2-8

The PRINCOMP Procedure

Observations 180
Variables 3

Simple Statistics

	H1	H2	H3
Mean	3.122222222	3.444444444	3.911111111
StD	0.836697122	1.004026654	0.941227588

Correlation Matrix

	H1	H2	H3
H1	1.0000	-.1847	0.0706
H2	-.1847	1.0000	0.2489
H3	0.0706	0.2489	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.27892224	0.21165323	0.4263	0.4263
2	1.06726901	0.41346026	0.3558	0.7821
3	0.65380875		0.2179	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
H1	-.345832	0.810234	0.473203
H2	0.741828	-.072704	0.666637
H3	0.574536	0.581580	-.575911

Analysis 2-9

The PRINCOMP Procedure

Observations 180
Variables 3

Simple Statistics

	S1	S2	S3
Mean	3.716666667	3.461111111	4.016666667
StD	0.719054314	0.828027804	0.647081976

Correlation Matrix

	S1	S2	S3
S1	1.0000	-.2203	-.0979
S2	-.2203	1.0000	-.0770
S3	-.0979	-.0770	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.22150876	0.16717636	0.4072	0.4072
2	1.05433240	0.33017357	0.3514	0.7586
3	0.72415884		0.2414	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
S1	-.720311	-.232135	0.653655
S2	0.689172	-.346409	0.636429
S3	0.078695	0.908908	0.409503

Analysis 2-10

The CORR Procedure

2 Variables: HK_1_HK HK_1_SH

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK_1_HK	196	0	1.00000	0	-3.13729	1.56838
HK_1_SH	196	0	1.00000	0	-3.19975	1.93528

Pearson Correlation Coefficients, N = 196
Prob > |r| under H0: Rho=0

	HK_1_HK	HK_1_SH
HK_1_HK	1.00000	0.75490 <.0001
HK_1_SH	0.75490 <.0001	1.00000

Analysis 2-11

The CORR Procedure

4 Variables: SH_1_HK SH_2_HK SH_1_SH SH_2_SH

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SH_1_HK	180	0	1.00000	0	-2.29606	2.01420
SH_2_HK	180	0	1.00000	0	-3.17127	1.50521
SH_1_SH	180	0	1.00000	0	-2.48541	1.95994
SH_2_SH	180	0	1.00000	0	-3.62044	2.16578

Pearson Correlation Coefficients, N = 180
Prob > |r| under H0: Rho=0

	SH_1_HK	SH_2_HK	SH_1_SH	SH_2_SH
SH_1_HK	1.00000	0.00000 1.0000	0.53167 <.0001	-0.32232 <.0001
SH_2_HK	0.00000 1.0000	1.00000	-0.41327 <.0001	-0.06767 0.3667
SH_1_SH	0.53167 <.0001	-0.41327 <.0001	1.00000	0.00000 1.0000
SH_2_SH	-0.32232 <.0001	-0.06767 0.3667	0.00000 1.0000	1.00000

Analysis 2-12

The PRINCOMP Procedure

Observations 376
Variables 3

Simple Statistics

	H1	H2	H3
Mean	3.151595745	3.297872340	4.260638298
StD	0.891977642	0.865083114	0.892124725

Correlation Matrix

	H1	H2	H3
H1	1.0000	-.1969	-.0029
H2	-.1969	1.0000	0.1341
H3	-.0029	0.1341	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.23957496	0.24224522	0.4132	0.4132
2	0.99732974	0.23423443	0.3324	0.7456
3	0.76309530		0.2544	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
H1	-.584359	0.562825	0.584597
H2	0.705116	-.004414	0.709078
H3	0.401667	0.826564	-.394277

Analysis 2-13

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
HK1	HK	196	-0.114	0.0154	0.1449	0.8363	0.9191	1.0204	0.0657
HK1	SH	180	-0.176	-0.017	0.1426	0.982	1.0835	1.2087	0.0808
HK1	Diff (1-2)		-0.171	0.0321	0.2354	0.9343	1.0012	1.0785	0.1034

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
HK1	Pooled	Equal	374	0.31	0.7559
HK1	Satterthwaite	Unequal	352	0.31	0.7576

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
HK1	Folded F	179	195	1.39	0.0246

Analysis 2-14

The PRINCOMP Procedure

Observations 376
Variables 3

Simple Statistics

	S1	S2	S3
Mean	3.654255319	3.297872340	4.082446809
StD	0.936736450	0.773973812	0.693674561

Correlation Matrix

	S1	S2	S3
S1	1.0000	-.0966	-.0873
S2	-.0966	1.0000	0.0286
S3	-.0873	0.0286	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.14531455	0.17379179	0.3818	0.3818
2	0.97152276	0.08836008	0.3238	0.7056
3	0.88316268		0.2944	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
S1	-.667445	0.024530	0.744255
S2	0.544111	-.666280	0.509917
S3	0.508390	0.745298	0.431358

Analysis 2-15

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
SH1	HK	196	-0.17	-0.019	0.1322	0.976	1.0727	1.1909	0.0766
SH1	SH	180	-0.114	0.0206	0.1555	0.8309	0.9168	1.0228	0.0683
SH1	Diff (1-2)		-0.243	-0.04	0.1636	0.9342	1.0011	1.0784	0.1034

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
SH1	Pooled	Equal	374	-0.38	0.7020
SH1	Satterthwaite	Unequal	372	-0.39	0.7001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
SH1	Folded F	195	179	1.37	0.0331

Analysis 2-16

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	376	0	1.00000	0	-2.69127	2.22273
SH1	376	0	1.00000	0	-3.19370	2.19097

Pearson Correlation Coefficients, N = 376

Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.58106
		<.0001
SH1	0.58106	1.00000
	<.0001	

Analysis 2-17

---------- Sample=HK ----------

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	196	0.01539	0.91915	3.01648	-2.69127	1.67467
SH1	196	-0.01895	1.07271	-3.71356	-3.17466	2.19097

Pearson Correlation Coefficients, N = 196

Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.68313
		<.0001
SH1	0.68313	1.00000
	<.0001	

Analysis 2-18

---------- Sample=SH ----------

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	180	-0.01676	1.08355	-3.01648	-2.36357	2.22273
SH1	180	0.02063	0.91683	3.71356	-3.19370	1.52518

Pearson Correlation Coefficients, N = 180

Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.48742
		<.0001
SH1	0.48742	1.00000
	<.0001	

Data Output for Q3

Analysis 3-1

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	188.5000000	33.63	<.0001	1.0000000	376.0000000	188.5000000
H1	4.3510638	111.77	<.0001	1.0000000	5.0000000	4.0000000
S1	4.0239362	92.51	<.0001	1.0000000	5.0000000	4.0000000
H2	4.3377660	127.93	<.0001	1.0000000	5.0000000	4.0000000
S2	3.5319149	89.90	<.0001	1.0000000	5.0000000	4.0000000
H3	2.6143617	62.45	<.0001	1.0000000	5.0000000	3.0000000
S3	3.9095745	97.45	<.0001	1.0000000	5.0000000	4.0000000
H4	4.0930851	108.75	<.0001	1.0000000	5.0000000	4.0000000
S4	3.7420213	92.26	<.0001	1.0000000	5.0000000	4.0000000
H5	4.1037234	100.96	<.0001	1.0000000	5.0000000	4.0000000
S5	3.6675532	89.75	<.0001	1.0000000	5.0000000	4.0000000
H6	4.1409574	104.00	<.0001	1.0000000	5.0000000	4.0000000
S6	3.1888298	65.17	<.0001	1.0000000	5.0000000	3.0000000
H7	4.2207447	109.71	<.0001	1.0000000	5.0000000	4.0000000
S7	3.7207447	109.21	<.0001	2.0000000	5.0000000	4.0000000

Analysis 3-2

Sample=HK

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	98.5000000	24.31	<.0001	1.0000000	196.0000000	98.5000000
H1	4.3673469	90.23	<.0001	1.0000000	5.0000000	4.0000000
S1	3.8316327	55.31	<.0001	1.0000000	5.0000000	4.0000000
H2	4.1989796	88.91	<.0001	1.0000000	5.0000000	4.0000000
S2	3.4336735	61.24	<.0001	1.0000000	5.0000000	3.0000000
H3	2.6887755	44.42	<.0001	1.0000000	5.0000000	3.0000000
S3	4.0714286	68.51	<.0001	2.0000000	5.0000000	4.0000000
H4	4.1173469	88.73	<.0001	1.0000000	5.0000000	4.0000000
S4	3.4744898	63.94	<.0001	1.0000000	5.0000000	4.0000000
H5	3.9846939	68.60	<.0001	1.0000000	5.0000000	4.0000000
S5	3.5612245	67.54	<.0001	1.0000000	5.0000000	4.0000000
H6	4.2755102	87.56	<.0001	1.0000000	5.0000000	4.0000000
S6	3.2908163	60.68	<.0001	1.0000000	5.0000000	3.0000000
H7	4.1785714	85.75	<.0001	1.0000000	5.0000000	4.0000000
S7	3.5459184	77.22	<.0001	2.0000000	5.0000000	4.0000000

Sample=SH

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	286.5000000	73.77	<.0001	197.0000000	376.0000000	286.5000000
H1	4.3333333	69.85	<.0001	2.0000000	5.0000000	5.0000000
S1	4.2333333	92.01	<.0001	2.0000000	5.0000000	4.0000000
H2	4.4888889	97.02	<.0001	2.0000000	5.0000000	5.0000000
S2	3.6388889	67.54	<.0001	2.0000000	5.0000000	4.0000000
H3	2.5333333	44.42	<.0001	1.0000000	4.0000000	3.0000000
S3	3.7333333	74.37	<.0001	1.0000000	5.0000000	4.0000000
H4	4.0666667	67.43	<.0001	2.0000000	5.0000000	4.0000000
S4	4.0333333	76.40	<.0001	2.0000000	5.0000000	4.0000000
H5	4.2333333	76.68	<.0001	1.0000000	5.0000000	4.0000000
S5	3.7833333	60.85	<.0001	1.0000000	5.0000000	4.0000000
H6	3.9944444	64.13	<.0001	1.0000000	5.0000000	4.0000000
S6	3.0777778	37.17	<.0001	1.0000000	5.0000000	3.0000000
H7	4.2666667	70.74	<.0001	1.0000000	5.0000000	4.0000000
S7	3.9111111	83.57	<.0001	2.0000000	5.0000000	4.0000000

Analysis 3-3

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
H1	HK	196	4.2719	4.3673	4.4628	0.6166	0.6777	0.7523	0.0484
H1	SH	180	4.2109	4.3333	4.4558	0.7543	0.8323	0.9285	0.062
H1	Diff (1-2)		-0.119	0.034	0.1874	0.7052	0.7556	0.814	0.078
S1	HK	196	3.695	3.8316	3.9683	0.8825	0.9699	1.0768	0.0693
S1	SH	180	4.1425	4.2333	4.3241	0.5594	0.6173	0.6886	0.046
S1	Diff (1-2)		-0.568	-0.402	-0.235	0.7655	0.8203	0.8836	0.0847
H2	HK	196	4.1058	4.199	4.2921	0.6015	0.6612	0.734	0.0472
H2	SH	180	4.3976	4.4889	4.5802	0.5626	0.6208	0.6925	0.0463
H2	Diff (1-2)		-0.42	-0.29	-0.16	0.5992	0.6421	0.6917	0.0663
S2	HK	196	3.3231	3.4337	3.5442	0.7141	0.7849	0.8714	0.0561
S2	SH	180	3.5326	3.6389	3.7452	0.6551	0.7228	0.8063	0.0539
S2	Diff (1-2)		-0.359	-0.205	-0.052	0.7053	0.7558	0.8142	0.078
H3	HK	196	2.5694	2.6888	2.8081	0.771	0.8474	0.9407	0.0605
H3	SH	180	2.4208	2.5333	2.6459	0.6934	0.7652	0.8536	0.057
H3	Diff (1-2)		-0.009	0.1554	0.3197	0.755	0.8091	0.8715	0.0835
S3	HK	196	3.9542	4.0714	4.1886	0.757	0.8321	0.9237	0.0594
S3	SH	180	3.6343	3.7333	3.8324	0.6104	0.6735	0.7513	0.0502
S3	Diff (1-2)		0.1838	0.3381	0.4924	0.7095	0.7603	0.819	0.0785
H4	HK	196	4.0258	4.1173	4.2089	0.5911	0.6497	0.7212	0.0464
H4	SH	180	3.9477	4.0667	4.1857	0.7333	0.8092	0.9026	0.0603
H4	Diff (1-2)		-0.098	0.0507	0.1989	0.6816	0.7304	0.7867	0.0754
S4	HK	196	3.3673	3.4745	3.5817	0.6922	0.7608	0.8446	0.0543
S4	SH	180	3.9292	4.0333	4.1375	0.6419	0.7083	0.7901	0.0528
S4	Diff (1-2)		-0.708	-0.559	-0.409	0.687	0.7361	0.793	0.076
H5	HK	196	3.8701	3.9847	4.0993	0.7399	0.8132	0.9028	0.0581
H5	SH	180	4.1244	4.2333	4.3423	0.6713	0.7407	0.8262	0.0552
H5	Diff (1-2)		-0.407	-0.249	-0.09	0.7273	0.7793	0.8395	0.0805
S5	HK	196	3.4572	3.5612	3.6652	0.6716	0.7382	0.8195	0.0527
S5	SH	180	3.6606	3.7833	3.906	0.756	0.8342	0.9305	0.0622
S5	Diff (1-2)		-0.382	-0.222	-0.063	0.7331	0.7856	0.8462	0.0811
H6	HK	196	4.1792	4.2755	4.3718	0.622	0.6836	0.7589	0.0488
H6	SH	180	3.8715	3.9944	4.1174	0.7573	0.8356	0.9322	0.0623
H6	Diff (1-2)		0.1268	0.2811	0.4354	0.7094	0.7602	0.8189	0.0785
S6	HK	196	3.1839	3.2908	3.3978	0.6908	0.7593	0.8429	0.0542
S6	SH	180	2.9144	3.0778	3.2412	1.0068	1.1109	1.2393	0.0828
S6	Diff (1-2)		0.0214	0.213	0.4047	0.881	0.9441	1.017	0.0975
H7	HK	196	4.0825	4.1786	4.2747	0.6207	0.6822	0.7573	0.0487
H7	SH	180	4.1477	4.2667	4.3857	0.7333	0.8092	0.9026	0.0603
H7	Diff (1-2)		-0.239	-0.088	0.0633	0.6958	0.7457	0.8032	0.077
S7	HK	196	3.4554	3.5459	3.6365	0.5849	0.6429	0.7137	0.0459
S7	SH	180	3.8188	3.9111	4.0035	0.5691	0.6279	0.7005	0.0468
S7	Diff (1-2)		-0.494	-0.365	-0.236	0.5933	0.6358	0.6848	0.0656

Analysis 3-4

The TTEST Procedure

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
H1	Pooled	Equal	374	0.44	0.6631
H1	Satterthwaite	Unequal	346	0.43	0.6658
S1	Pooled	Equal	374	-4.74	<.0001
S1	Satterthwaite	Unequal	334	-4.83	<.0001
H2	Pooled	Equal	374	-4.37	<.0001
H2	Satterthwaite	Unequal	374	-4.38	<.0001
S2	Pooled	Equal	374	-2.63	0.0089
S2	Satterthwaite	Unequal	374	-2.64	0.0087
H3	Pooled	Equal	374	1.86	0.0635
H3	Satterthwaite	Unequal	374	1.87	0.0624
S3	Pooled	Equal	374	4.31	<.0001
S3	Satterthwaite	Unequal	368	4.35	<.0001
H4	Pooled	Equal	374	0.67	0.5019
H4	Satterthwaite	Unequal	343	0.67	0.5059
S4	Pooled	Equal	374	-7.35	<.0001
S4	Satterthwaite	Unequal	374	-7.38	<.0001
H5	Pooled	Equal	374	-3.09	0.0021
H5	Satterthwaite	Unequal	374	-3.10	0.0021
S5	Pooled	Equal	374	-2.74	0.0065
S5	Satterthwaite	Unequal	359	-2.72	0.0068
H6	Pooled	Equal	374	3.58	0.0004
H6	Satterthwaite	Unequal	346	3.55	0.0004
S6	Pooled	Equal	374	2.19	0.0294
S6	Satterthwaite	Unequal	313	2.15	0.0321
H7	Pooled	Equal	374	-1.14	0.2532
H7	Satterthwaite	Unequal	351	-1.14	0.2567
S7	Pooled	Equal	374	-5.56	<.0001
S7	Satterthwaite	Unequal	373	-5.57	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
H1	Folded F	179	195	1.51	0.0050
S1	Folded F	195	179	2.47	<.0001
H2	Folded F	195	179	1.13	0.3915
S2	Folded F	195	179	1.18	0.2627
H3	Folded F	195	179	1.23	0.1655
S3	Folded F	195	179	1.53	0.0042
H4	Folded F	179	195	1.55	0.0027
S4	Folded F	195	179	1.15	0.3308
H5	Folded F	195	179	1.21	0.2041
S5	Folded F	179	195	1.28	0.0949
H6	Folded F	179	195	1.49	0.0061
S6	Folded F	179	195	2.14	<.0001
H7	Folded F	179	195	1.41	0.0198
S7	Folded F	195	179	1.05	0.7501

Analysis 3-5

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
D1	0.3271277	6.49	<.0001	-2.0000000	3.0000000	0
D2	0.8058511	20.55	<.0001	-2.0000000	3.0000000	1.0000000
D3	-1.2952128	-33.07	<.0001	-3.0000000	2.0000000	-1.0000000
D4	0.3510638	9.67	<.0001	-2.0000000	2.0000000	0
D5	0.4361702	9.68	<.0001	-2.0000000	4.0000000	1.0000000
D6	0.9521277	16.87	<.0001	-4.0000000	4.0000000	1.0000000
D7	0.5000000	11.03	<.0001	-4.0000000	3.0000000	0

Analysis 3-6

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
D1	HK	196	0.3845	0.5357	0.687	0.9768	1.0736	1.1918	0.0767
D1	SH	180	-0.019	0.1	0.2185	0.7302	0.8057	0.8988	0.0601
D1	Diff (1-2)		0.2419	0.4357	0.6295	0.891	0.9548	1.0285	0.0986
D2	HK	196	0.6618	0.7653	0.8688	0.6683	0.7345	0.8154	0.0525
D2	SH	180	0.7342	0.85	0.9658	0.7135	0.7873	0.8782	0.0587
D2	Diff (1-2)		-0.239	-0.085	0.0696	0.7094	0.7602	0.8189	0.0785
D3	HK	196	-1.476	-1.383	-1.289	0.6053	0.6653	0.7385	0.0475
D3	SH	180	-1.324	-1.2	-1.076	0.7628	0.8417	0.9389	0.0627
D3	Diff (1-2)		-0.336	-0.183	-0.029	0.7044	0.7548	0.8131	0.0779
D4	HK	196	0.5328	0.6429	0.7529	0.7108	0.7812	0.8672	0.0558
D4	SH	180	-0.029	0.0333	0.0953	0.382	0.4215	0.4702	0.0314
D4	Diff (1-2)		0.4806	0.6095	0.7384	0.5926	0.635	0.684	0.0656
D5	HK	196	0.3158	0.4235	0.5311	0.6952	0.7641	0.8483	0.0546
D5	SH	180	0.3056	0.45	0.5944	0.8898	0.9818	1.0952	0.0732
D5	Diff (1-2)		-0.204	-0.027	0.1511	0.8166	0.8751	0.9426	0.0903
D6	HK	196	0.8438	0.9847	1.1255	0.9097	0.9999	1.11	0.0714
D6	SH	180	0.7415	0.9167	1.0918	1.079	1.1906	1.3282	0.0887
D6	Diff (1-2)		-0.154	0.068	0.2904	1.0221	1.0953	1.1799	0.1131
D7	HK	196	0.5252	0.6327	0.7402	0.6943	0.7631	0.8472	0.0545
D7	SH	180	0.2125	0.3556	0.4986	0.8812	0.9724	1.0847	0.0725
D7	Diff (1-2)		0.1006	0.2771	0.4536	0.8115	0.8696	0.9367	0.0898

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
D1	Pooled	Equal	374	4.42	<.0001
D1	Satterthwaite	Unequal	360	4.47	<.0001
D2	Pooled	Equal	374	-1.08	0.2812
D2	Satterthwaite	Unequal	365	-1.08	0.2827
D3	Pooled	Equal	374	-2.34	0.0196
D3	Satterthwaite	Unequal	340	-2.32	0.0209
D4	Pooled	Equal	374	9.30	<.0001
D4	Satterthwaite	Unequal	305	9.52	<.0001
D5	Pooled	Equal	374	-0.29	0.7692
D5	Satterthwaite	Unequal	338	-0.29	0.7715
D6	Pooled	Equal	374	0.60	0.5478
D6	Satterthwaite	Unequal	351	0.60	0.5508
D7	Pooled	Equal	374	3.09	0.0022
D7	Satterthwaite	Unequal	339	3.06	0.0024

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
D1	Folded F	195	179	1.78	<.0001
D2	Folded F	179	195	1.15	0.3424

The TTEST Procedure

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
D3	Folded F	179	195	1.60	0.0013
D4	Folded F	195	179	3.44	<.0001
D5	Folded F	179	195	1.65	0.0006
D6	Folded F	179	195	1.42	0.0171
D7	Folded F	179	195	1.62	0.0010

Analysis 3-7

The PRINCOMP Procedure

Observations 196

Variables 7

Simple Statistics

	H1	H2	H3	H4
Mean	4.367346939	4.198979592	2.688775510	4.117346939
StD	0.677669538	0.661155926	0.847364863	0.649658768

Simple Statistics

	H5	H6	H7
Mean	3.984693878	4.275510204	4.178571429
StD	0.813205375	0.683589504	0.682191040

Correlation Matrix

	H1	H2	H3	H4	H5	H6	H7
H1	1.0000	0.2137	0.0304	0.0880	-.0084	-.2307	0.3122
H2	0.2137	1.0000	0.0013	-.0546	0.1488	0.0029	-.0678
H3	0.0304	0.0013	1.0000	0.0294	0.3503	-.2408	0.0079
H4	0.0880	-.0546	0.0294	1.0000	0.1490	-.3157	0.0913
H5	-.0084	0.1488	0.3503	0.1490	1.0000	0.3028	0.1251
H6	-.2307	0.0029	-.2408	-.3157	0.3028	1.0000	-.1830
H7	0.3122	-.0678	0.0079	0.0913	0.1251	-.1830	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.66975423	0.27267580	0.2385	0.2385
2	1.39707842	0.21945828	0.1996	0.4381
3	1.17762014	0.16540512	0.1682	0.6064
4	1.01221502	0.10348645	0.1446	0.7510
5	0.90872858	0.33406851	0.1298	0.8808
6	0.57466006	0.31471652	0.0821	0.9629
7	0.25994355		0.0371	1.0000

Analysis 3-8

The PRINCOMP Procedure

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
H1	0.490250	-.056431	0.509672	0.033185	-.088971	0.697812	-.027308
H2	0.097805	0.264721	0.608803	-.527649	0.246325	-.429097	0.162797
H3	0.290613	0.455136	-.385261	-.330399	-.504249	0.082492	0.435585
H4	0.406645	-.014233	-.362860	0.036937	0.767796	0.086965	0.323006
H5	0.095651	0.768251	-.056964	0.217905	0.162449	0.024644	-.568258
H6	-.542520	0.359338	0.230621	0.361362	0.121965	0.261896	0.556160
H7	0.443617	-.007308	0.181848	0.657185	-.215327	-.495348	0.215530

Analysis 3-9

The PRINCOMP Procedure

Observations 196

Variables 7

Simple Statistics

	S1	S2	S3	S4
Mean	3.831632653	3.433673469	4.071428571	3.474489796
StD	0.969916405	0.784914678	0.832050294	0.760810799

Simple Statistics

	S5	S6	S7
Mean	3.561224490	3.290816327	3.545918367
StD	0.738207483	0.759296129	0.642857143

Correlation Matrix

	S1	S2	S3	S4	S5	S6	S7
S1	1.0000	-.0451	0.1167	-.3360	0.1685	0.1295	0.6252
S2	-.0451	1.0000	0.1957	0.3922	-.0770	0.1229	-.0651
S3	0.1167	0.1957	1.0000	-.0376	0.3018	-.4146	0.2048
S4	-.3360	0.3922	-.0376	1.0000	0.1443	0.1328	-.3646
S5	0.1685	-.0770	0.3018	0.1443	1.0000	0.0458	0.3669
S6	0.1295	0.1229	-.4146	0.1328	0.0458	1.0000	-.0012
S7	0.6252	-.0651	0.2048	-.3646	0.3669	-.0012	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.10565643	0.61893371	0.3008	0.3008
2	1.48672272	0.14110669	0.2124	0.5132
3	1.34561603	0.39509758	0.1922	0.7054
4	0.95051846	0.48599112	0.1358	0.8412
5	0.46452734	0.07369632	0.0664	0.9076
6	0.39083102	0.13470301	0.0558	0.9634
7	0.25612801		0.0366	1.0000

Analysis 3-10

The PRINCOMP Procedure

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
S1	0.528677	-.109687	0.278671	0.290074	-.311770	0.602099	-.294865
S2	-.183758	0.465644	0.343078	0.622445	0.053539	-.352420	-.342348
S3	0.265760	0.606795	-.279292	0.125903	0.474681	0.357223	0.338209
S4	-.401800	0.426773	0.329023	-.214235	-.540010	0.279972	0.363695
S5	0.306357	0.379563	0.251016	-.677415	0.109088	-.154584	-.452085
S6	-.094349	-.276353	0.720382	-.045897	0.554560	0.135772	0.260192
S7	0.593217	0.019243	0.190840	0.075326	-.252118	-.514737	0.526414

Analysis 3-11

The PRINCOMP Procedure

Observations 180

Variables 7

Simple Statistics

	H1	H2	H3	H4
Mean	4.333333333	4.488888889	2.533333333	4.066666667
StD	0.832308495	0.620766231	0.765163290	0.809165375

Simple Statistics

	H5	H6	H7
Mean	4.233333333	3.994444444	4.266666667
StD	0.740677630	0.835639268	0.809165375

Correlation Matrix

	H1	H2	H3	H4	H5	H6	H7
H1	1.0000	0.4613	0.3246	0.6055	0.2175	0.0830	0.3816
H2	0.4613	1.0000	0.5889	0.3796	0.2851	0.1560	0.2395
H3	0.3246	0.5889	1.0000	0.2851	0.2228	0.3105	0.1119
H4	0.6055	0.3796	0.2851	1.0000	0.5052	0.2236	0.3311
H5	0.2175	0.2851	0.2228	0.5052	1.0000	0.3993	0.2312
H6	0.0830	0.1560	0.3105	0.2236	0.3993	1.0000	0.0022
H7	0.3816	0.2395	0.1119	0.3311	0.2312	0.0022	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.88901239	1.69463262	0.4127	0.4127
2	1.19437977	0.16621611	0.1706	0.5833
3	1.02816366	0.36091668	0.1469	0.7302
4	0.66724697	0.10426935	0.0953	0.8255
5	0.56297762	0.19311117	0.0804	0.9060
6	0.36986645	0.08151332	0.0528	0.9588
7	0.28835313		0.0412	1.0000

Analysis 3-12

The PRINCOMP Procedure

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
H1	0.427996	-.377262	-.059569	-.371195	0.421626	0.180472	0.568173
H2	0.427230	-.020078	-.479662	0.083354	-.342258	0.622444	-.274720
H3	0.377456	0.250100	-.566893	0.181924	0.000425	-.647350	0.146458
H4	0.458755	-.131988	0.284753	-.462343	0.015455	-.303186	-.620578
H5	0.368890	0.296111	0.494004	0.006746	-.596586	-.006641	0.419755
H6	0.248745	0.673096	0.203746	0.181367	0.578337	0.253089	-.110153
H7	0.288809	-.486374	0.279951	0.758597	0.120268	-.070073	-.082541

Analysis 3-13

The PRINCOMP Procedure

Observations 180
Variables 7

Simple Statistics

	S1	S2	S3	S4
Mean	4.233333333	3.638888889	3.733333333	4.033333333
StD	0.617256500	0.722842688	0.673521555	0.708290885

Simple Statistics

	S5	S6	S7
Mean	3.783333333	3.077777778	3.911111111
StD	0.834152298	1.110918667	0.627924567

Correlation Matrix

	S1	S2	S3	S4	S5	S6	S7
S1	1.0000	0.6782	0.0968	0.3399	0.1855	0.2504	0.4430
S2	0.6782	1.0000	0.0765	0.3073	0.3513	0.3552	0.5566
S3	0.0968	0.0765	1.0000	0.1827	-.0537	0.2369	-.0828
S4	0.3399	0.3073	0.1827	1.0000	0.2014	-.1453	0.0569
S5	0.1855	0.3513	-.0537	0.2014	1.0000	0.2715	0.4857
S6	0.2504	0.3552	0.2369	-.1453	0.2715	1.0000	0.3864
S7	0.4430	0.5566	-.0828	0.0569	0.4857	0.3864	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.71910182	1.46048652	0.3884	0.3884
2	1.25861530	0.12693233	0.1798	0.5682
3	1.13168297	0.31162737	0.1617	0.7299
4	0.82005560	0.39242055	0.1172	0.8471
5	0.42763505	0.07864763	0.0611	0.9082
6	0.34898743	0.05506560	0.0499	0.9580
7	0.29392182		0.0420	1.0000

Analysis 3-14

The PRINCOMP Procedure

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
S1	0.461725	0.244498	-.061009	-.481975	-.029558	-.328151	0.618427
S2	0.519709	0.092471	-.054485	-.264761	-.036898	-.242676	-.766832
S3	0.084449	0.433241	0.731721	0.248593	0.439657	-.120536	-.011352
S4	0.223395	0.681976	-.272642	0.306367	-.304319	0.473342	0.012081
S5	0.363736	-.230582	-.210968	0.735817	-.030433	-.460018	0.126693
S6	0.329896	-.347930	0.569964	0.021117	-.605259	0.269103	0.077800
S7	0.467482	-.323508	-.119135	-.008354	0.587020	0.557503	0.084490

Analysis 3-15

The CORR Procedure

7 Variables: HK_1_HK HK_2_HK HK_3_HK HK_4_HK HK_1_SH HK_2_SH HK_3_SH

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK_1_HK	196	0	1.00000	0	-3.43089	3.26809
HK_2_HK	196	0	1.00000	0	-2.73277	2.02151
HK_3_HK	196	0	1.00000	0	-4.31199	2.06898
HK_4_HK	196	0	1.00000	0	-3.15863	3.87871
HK_1_SH	196	0	1.00000	0	-2.12675	1.48465
HK_2_SH	196	0	1.00000	0	-2.57100	1.92329
HK_3_SH	196	0	1.00000	0	-2.56891	1.90186

Pearson Correlation Coefficients, N = 196
Prob > |r| under H0: Rho=0

	HK_1_HK	HK_2_HK	HK_3_HK	HK_4_HK	HK_1_SH	HK_2_SH	HK_3_SH
HK_1_HK	1.00000	0.00000	0.00000	0.00000	-0.00300	0.41802	-0.04576
		1.0000	1.0000	1.0000	0.9667	<.0001	0.5242
HK_2_HK	0.00000	1.00000	0.00000	0.00000	-0.17646	0.64657	0.30735
	1.0000		1.0000	1.0000	0.0134	<.0001	<.0001
HK_3_HK	0.00000	0.00000	1.00000	0.00000	0.13352	-0.18884	0.26113
	1.0000	1.0000		1.0000	0.0621	0.0080	0.0002
HK_4_HK	0.00000	0.00000	0.00000	1.00000	0.36334	-0.11992	0.20333
	1.0000	1.0000	1.0000		<.0001	0.0941	0.0043
HK_1_SH	-0.00300	-0.17646	0.13352	0.36334	1.00000	0.00000	0.00000
	0.9667	0.0134	0.0621	<.0001		1.0000	1.0000
HK_2_SH	0.41802	0.64657	-0.18884	-0.11992	0.00000	1.00000	0.00000
	<.0001	<.0001	0.0080	0.0941	1.0000		1.0000
HK_3_SH	-0.04576	0.30735	0.26113	0.20333	0.00000	0.00000	1.00000
	0.5242	<.0001	0.0002	0.0043	1.0000	1.0000	

Analysis 3-16

The CORR Procedure

6 Variables: SH_1_HK SH_2_HK SH_3_HK SH_1_SH SH_2_SH SH_3_SH

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SH_1_HK	180	0	1.00000	0	-2.15167	1.52524
SH_2_HK	180	0	1.00000	0	-2.28780	2.08893
SH_3_HK	180	0	1.00000	0	-2.64449	2.35428
SH_1_SH	180	0	1.00000	0	-3.42241	1.94597
SH_2_SH	180	0	1.00000	0	-2.14690	2.54939
SH_3_SH	180	0	1.00000	0	-3.53731	2.52740

Pearson Correlation Coefficients, N = 180
Prob > |r| under H0: Rho=0

	SH_1_HK	SH_2_HK	SH_3_HK	SH_1_SH	SH_2_SH	SH_3_SH
SH_1_HK	1.00000	0.00000	0.00000	0.63335	0.42365	0.08754
		1.0000	1.0000	<.0001	<.0001	0.2426
SH_2_HK	0.00000	1.00000	0.00000	-0.05088	-0.16392	0.28882
	1.0000		1.0000	0.4976	0.0279	<.0001
SH_3_HK	0.00000	0.00000	1.00000	-0.10730	0.12107	-0.15782
	1.0000	1.0000		0.1517	0.1055	0.0343
SH_1_SH	0.63335	-0.05088	-0.10730	1.00000	0.00000	0.00000
	<.0001	0.4976	0.1517		1.0000	1.0000
SH_2_SH	0.42365	-0.16392	0.12107	0.00000	1.00000	0.00000
	<.0001	0.0279	0.1055	1.0000		1.0000
SH_3_SH	0.08754	0.28882	-0.15782	0.00000	0.00000	1.00000
	0.2426	<.0001	0.0343	1.0000	1.0000	

Analysis 3-17

The PRINCOMP Procedure

Observations 376
Variables 7

Simple Statistics

	H1	H2	H3	H4
Mean	4.351063830	4.337765957	2.614361702	4.093085106
StD	0.754823731	0.657477449	0.811718255	0.729825589

Simple Statistics

	H5	H6	H7
Mean	4.103723404	4.140957447	4.220744681
StD	0.788170518	0.772060888	0.745972638

Correlation Matrix

	H1	H2	H3	H4	H5	H6	H7
H1	1.0000	0.3246	0.1780	0.3907	0.1000	-.0440	0.3498
H2	0.3246	1.0000	0.2297	0.1566	0.2358	0.0373	0.0977
H3	0.1780	0.2297	1.0000	0.1598	0.2753	0.0529	0.0529
H4	0.3907	0.1566	0.1598	1.0000	0.3170	0.0050	0.2267
H5	0.1000	0.2358	0.2753	0.3170	1.0000	0.3090	0.1832
H6	-.0440	0.0373	0.0529	0.0050	0.3090	1.0000	-.0866
H7	0.3498	0.0977	0.0529	0.2267	0.1832	-.0866	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.12348727	0.82346482	0.3034	0.3034
2	1.30002245	0.33531293	0.1857	0.4891
3	0.96470952	0.15993135	0.1378	0.6269
4	0.80477818	0.05854327	0.1150	0.7419
5	0.74623491	0.09504879	0.1066	0.8485
6	0.65118611	0.24160456	0.0930	0.9415
7	0.40958156		0.0585	1.0000

Analysis 3-18

The PRINCOMP Procedure

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
H1	0.466340	-.361442	-.035917	0.276410	-.163425	0.504368	-.541387
H2	0.389724	0.039852	-.537277	0.582852	0.063719	-.368566	0.279719
H3	0.342181	0.224720	-.532735	-.601452	0.203743	0.354077	0.141349
H4	0.454156	-.119026	0.280695	-.242206	-.674976	-.128644	0.412286
H5	0.419847	0.456836	0.231140	-.164069	0.124301	-.485607	-.532372
H6	0.101533	0.674016	0.324345	0.368664	0.012448	0.481699	0.249181
H7	0.347443	-.374310	0.434536	-.025313	0.675665	0.001929	0.305266

Analysis 3-19

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
HK1	HK	196	-0.173	-0.063	0.0481	0.7143	0.785	0.8715	0.0561
HK1	SH	180	-0.107	0.0681	0.243	1.0779	1.1894	1.3268	0.0887
HK1	Diff (1-2)		-0.333	-0.131	0.0723	0.9324	0.9992	1.0763	0.1032
HK2	HK	196	-0.078	0.0615	0.2011	0.902	0.9913	1.1005	0.0708
HK2	SH	180	-0.215	-0.067	0.0813	0.9134	1.0078	1.1243	0.0751
HK2	Diff (1-2)		-0.074	0.1284	0.3312	0.9325	0.9993	1.0764	0.1032

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
HK1	Pooled	Equal	374	-1.27	0.2063
HK1	Satterthwaite	Unequal	306	-1.24	0.2142
HK2	Pooled	Equal	374	1.24	0.2141
HK2	Satterthwaite	Unequal	370	1.24	0.2145

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
HK1	Folded F	179	195	2.30	<.0001
HK2	Folded F	179	195	1.03	0.8201

Analysis 3-20

The PRINCOMP Procedure

Observations 376
Variables 7

Simple Statistics

	S1	S2	S3	S4
Mean	4.023936170	3.531914894	3.909574468	3.742021277
StD	0.843460451	0.761782158	0.777904076	0.786513088

Simple Statistics

	S5	S6	S7
Mean	3.667553191	3.188829787	3.720744681
StD	0.792370534	0.948814116	0.660662680

Correlation Matrix

	S1	S2	S3	S4	S5	S6	S7
S1	1.0000	0.2291	0.0521	-.0027	0.1955	0.1376	0.5767
S2	0.2291	1.0000	0.1129	0.3765	0.1480	0.2259	0.2429
S3	0.0521	0.1129	1.0000	-.0295	0.1025	-.0455	0.0182
S4	-.0027	0.3765	-.0295	1.0000	0.2086	-.0596	-.0569
S5	0.1955	0.1480	0.1025	0.2086	1.0000	0.1618	0.4437
S6	0.1376	0.2259	-.0455	-.0596	0.1618	1.0000	0.1737
S7	0.5767	0.2429	0.0182	-.0569	0.4437	0.1737	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.11268647	0.83298926	0.3018	0.3018
2	1.27969721	0.24194117	0.1828	0.4846
3	1.03775604	0.09792400	0.1483	0.6329
4	0.93983204	0.09689306	0.1343	0.7671
5	0.84293898	0.36061509	0.1204	0.8876
6	0.48232389	0.17755852	0.0689	0.9565
7	0.30476536		0.0435	1.0000

Analysis 3-21

The PRINCOMP Procedure

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
S1	0.481795	-.292693	0.054540	-.170162	-.478587	0.521080	-.386917
S2	0.401000	0.467554	-.086851	0.282491	-.384558	-.559573	-.268777
S3	0.096657	0.071540	0.846428	0.475723	0.030933	0.149566	0.139500
S4	0.171142	0.755556	-.070831	-.266568	0.016610	0.455093	0.341151
S5	0.437668	0.056300	0.131462	-.230113	0.744348	-.087452	-.416343
S6	0.277031	-.107667	-.499451	0.699371	0.258190	0.298653	0.131282
S7	0.547851	-.324006	0.035933	-.227600	-.033491	-.298382	0.672037

Analysis 3-22

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
SH1	HK	196	-0.38	-0.257	-0.134	0.7972	0.8762	0.9727	0.0626
SH1	SH	180	0.1251	0.2799	0.4347	0.9537	1.0524	1.1739	0.0784
SH1	Diff (1-2)		-0.733	-0.537	-0.341	0.9001	0.9645	1.039	0.0996
SH2	HK	196	-0.314	-0.149	0.0149	1.0618	1.167	1.2956	0.0834
SH2	SH	180	0.0527	0.1627	0.2728	0.6783	0.7484	0.8349	0.0558
SH2	Diff (1-2)		-0.513	-0.312	-0.111	0.923	0.9891	1.0654	0.1021
SH3	HK	196	-0.048	0.116	0.2797	1.0574	1.1621	1.2902	0.083
SH3	SH	180	-0.24	-0.126	-0.013	0.6978	0.77	0.859	0.0574
SH3	Diff (1-2)		0.0405	0.2422	0.444	0.9275	0.994	1.0707	0.1026

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
SH1	Pooled	Equal	374	-5.39	<.0001
SH1	Satterthwaite	Unequal	349	-5.35	<.0001
SH2	Pooled	Equal	374	-3.06	0.0024
SH2	Satterthwaite	Unequal	335	-3.11	0.0020
SH3	Pooled	Equal	374	2.36	0.0188
SH3	Satterthwaite	Unequal	341	2.40	0.0169

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
SH1	Folded F	179	195	1.44	0.0124
SH2	Folded F	195	179	2.43	<.0001
SH3	Folded F	195	179	2.28	<.0001

Analysis 3-23

The CORR Procedure

5 Variables: HK1 HK2 SH1 SH2 SH3

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	376	0	1.00000	0	-3.42661	1.89661
HK2	376	0	1.00000	0	-3.12719	2.28689
SH1	376	0	1.00000	0	-3.35891	2.43464
SH2	376	0	1.00000	0	-3.09917	2.25823
SH3	376	0	1.00000	0	-2.95436	2.57680

Pearson Correlation Coefficients, N = 376

Prob > |r| under H0: Rho=0

	HK1	HK2	SH1	SH2	SH3
HK1	1.00000	0.00000	0.47170	0.51553	0.15103
		1.0000	<.0001	<.0001	0.0033
HK2	0.00000	1.00000	0.03318	0.16278	-0.10486
	1.0000		0.5212	0.0015	0.0421
SH1	0.47170	0.03318	1.00000	0.00000	0.00000
	<.0001	0.5212		1.0000	1.0000
SH2	0.51553	0.16278	0.00000	1.00000	0.00000
	<.0001	0.0015	1.0000		1.0000
SH3	0.15103	-0.10486	0.00000	0.00000	1.00000
	0.0033	0.0421	1.0000	1.0000	

Analysis 3-24

---------- Sample=HK ----------

The CORR Procedure

5 Variables: HK1 HK2 SH1 SH2 SH3

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	196	-0.06251	0.78503	-12.25219	-3.42661	1.18029
HK2	196	0.06146	0.99134	12.04526	-3.12719	2.28689
SH1	196	-0.25703	0.87622	-50.37721	-2.50142	1.51355
SH2	196	-0.14946	1.16703	-29.29335	-3.09917	1.59134
SH3	196	0.11597	1.16214	22.72943	-2.74618	2.57680

Pearson Correlation Coefficients, N = 196

Prob > |r| under H0: Rho=0

	HK1	HK2	SH1	SH2	SH3
HK1	1.00000	-0.01787	0.26976	0.53688	0.27033
		0.8036	0.0001	<.0001	0.0001
HK2	-0.01787	1.00000	0.09218	0.33900	-0.11134
	0.8036		0.1988	<.0001	0.1203
SH1	0.26976	0.09218	1.00000	-0.20429	0.23224
	0.0001	0.1988		0.0041	0.0011
SH2	0.53688	0.33900	-0.20429	1.00000	-0.09476
	<.0001	<.0001	0.0041		0.1865
SH3	0.27033	-0.11134	0.23224	-0.09476	1.00000
	0.0001	0.1203	0.0011	0.1865	

Analysis 3-25

---------- Sample=SH ----------

The CORR Procedure

5 Variables: HK1 HK2 SH1 SH2 SH3

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	180	0.06807	1.18940	12.25219	-2.52969	1.89661
HK2	180	-0.06692	1.00784	-12.04526	-2.49091	1.81726
SH1	180	0.27987	1.05237	50.37721	-3.35891	2.43464
SH2	180	0.16274	0.74845	29.29335	-1.97857	2.25823
SH3	180	-0.12627	0.77001	-22.72943	-2.95436	1.48095

Pearson Correlation Coefficients, N = 180

Prob > |r| under H0: Rho=0

	HK1	HK2	SH1	SH2	SH3
HK1	1.00000	0.01997	0.59863	0.58730	0.07023
		0.7902	<.0001	<.0001	0.3489
HK2	0.01997	1.00000	0.01736	-0.08647	-0.12403
	0.7902		0.8170	0.2484	0.0972
SH1	0.59863	0.01736	1.00000	0.17737	-0.23379
	<.0001	0.8170		0.0172	0.0016
SH2	0.58730	-0.08647	0.17737	1.00000	0.31171
	<.0001	0.2484	0.0172		<.0001
SH3	0.07023	-0.12403	-0.23379	0.31171	1.00000
	0.3489	0.0972	0.0016	<.0001	

Data Output for Q4

Analysis 4-1

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	188.5000000	33.63	<.0001	1.0000000	376.0000000	188.5000000
H1	3.1409574	91.67	<.0001	1.0000000	4.0000000	3.0000000
S1	4.3430851	141.55	<.0001	2.0000000	5.0000000	4.0000000
H2	3.4095745	80.50	<.0001	1.0000000	5.0000000	3.0000000
S2	2.9920213	61.39	<.0001	1.0000000	5.0000000	3.0000000
H3	2.9787234	69.93	<.0001	1.0000000	4.0000000	3.0000000
S3	3.0585106	92.33	<.0001	2.0000000	5.0000000	3.0000000
H4	4.2872340	90.71	<.0001	1.0000000	5.0000000	4.0000000
S4	2.4707447	51.57	<.0001	1.0000000	5.0000000	2.0000000
H5	1.9361702	43.57	<.0001	1.0000000	5.0000000	2.0000000
S5	2.5186170	43.08	<.0001	1.0000000	5.0000000	2.0000000

Analysis 4-2

Sample=HK

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	98.5000000	24.31	<.0001	1.0000000	196.0000000	98.5000000
H1	3.0612245	68.08	<.0001	1.0000000	4.0000000	3.0000000
S1	4.2704082	110.90	<.0001	2.0000000	5.0000000	4.0000000
H2	3.2908163	55.08	<.0001	2.0000000	5.0000000	3.0000000
S2	2.7040816	45.19	<.0001	1.0000000	5.0000000	3.0000000
H3	2.7142857	41.44	<.0001	1.0000000	4.0000000	3.0000000
S3	2.8571429	72.11	<.0001	2.0000000	5.0000000	3.0000000
H4	4.4285714	56.12	<.0001	1.0000000	5.0000000	5.0000000
S4	2.3163265	38.22	<.0001	1.0000000	5.0000000	2.0000000
H5	1.6530612	28.52	<.0001	1.0000000	5.0000000	1.0000000
S5	2.2346939	26.34	<.0001	1.0000000	4.0000000	2.0000000

Sample=SH

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	286.5000000	73.77	<.0001	197.0000000	376.0000000	286.5000000
H1	3.2277778	62.60	<.0001	1.0000000	4.0000000	3.0000000
S1	4.4222222	92.33	<.0001	2.0000000	5.0000000	4.5000000
H2	3.5388889	60.37	<.0001	1.0000000	5.0000000	4.0000000
S2	3.3055556	46.31	<.0001	1.0000000	5.0000000	3.0000000
H3	3.2666667	73.76	<.0001	2.0000000	4.0000000	3.0000000
S3	3.2777778	66.57	<.0001	2.0000000	4.0000000	3.0000000
H4	4.1333333	89.45	<.0001	2.0000000	5.0000000	4.0000000
S4	2.6388889	35.96	<.0001	1.0000000	5.0000000	2.0000000
H5	2.2444444	37.21	<.0001	1.0000000	4.0000000	2.0000000
S5	2.8277778	38.52	<.0001	1.0000000	5.0000000	3.0000000

Analysis 4-3

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
H1	HK	196	2.9725	3.0612	3.1499	0.5727	0.6295	0.6988	0.045
H1	SH	180	3.126	3.2278	3.3295	0.6269	0.6918	0.7717	0.0516
H1	Diff (1-2)		-0.301	-0.167	-0.033	0.6159	0.66	0.711	0.0681
S1	HK	196	4.1945	4.2704	4.3463	0.4905	0.5391	0.5985	0.0385
S1	SH	180	4.3277	4.4222	4.5167	0.5824	0.6426	0.7168	0.0479
S1	Diff (1-2)		-0.272	-0.152	-0.032	0.5514	0.5909	0.6365	0.061
H2	HK	196	3.173	3.2908	3.4086	0.761	0.8364	0.9286	0.0597
H2	SH	180	3.4232	3.5389	3.6546	0.7128	0.7865	0.8774	0.0586
H2	Diff (1-2)		-0.413	-0.248	-0.083	0.7586	0.8129	0.8757	0.0839
S2	HK	196	2.5861	2.7041	2.8221	0.7622	0.8377	0.93	0.0598
S2	SH	180	3.1647	3.3056	3.4464	0.868	0.9578	1.0684	0.0714
S2	Diff (1-2)		-0.784	-0.601	-0.419	0.8372	0.8972	0.9664	0.0926
H3	HK	196	2.5851	2.7143	2.8435	0.8344	0.9171	1.0181	0.0655
H3	SH	180	3.1793	3.2667	3.3541	0.5385	0.5942	0.6628	0.0443
H3	Diff (1-2)		-0.711	-0.552	-0.394	0.7273	0.7794	0.8396	0.0805
S3	HK	196	2.779	2.8571	2.9353	0.5047	0.5547	0.6158	0.0396
S3	SH	180	3.1806	3.2778	3.3749	0.5987	0.6606	0.7369	0.0492
S3	Diff (1-2)		-0.544	-0.421	-0.297	0.5671	0.6077	0.6546	0.0627
H4	HK	196	4.2729	4.4286	4.5842	1.0052	1.1048	1.2265	0.0789
H4	SH	180	4.0421	4.1333	4.2245	0.5619	0.62	0.6916	0.0462
H4	Diff (1-2)		0.1114	0.2952	0.4791	0.8452	0.9057	0.9756	0.0935
S4	HK	196	2.1968	2.3163	2.4359	0.772	0.8485	0.942	0.0606
S4	SH	180	2.4941	2.6389	2.7837	0.8923	0.9846	1.0983	0.0734
S4	Diff (1-2)		-0.509	-0.323	-0.137	0.8549	0.9162	0.9869	0.0946
H5	HK	196	1.5387	1.6531	1.7674	0.7383	0.8115	0.9009	0.058
H5	SH	180	2.1254	2.2444	2.3635	0.7335	0.8093	0.9028	0.0603
H5	Diff (1-2)		-0.756	-0.591	-0.427	0.7563	0.8104	0.873	0.0837
S5	HK	196	2.0673	2.2347	2.402	1.0809	1.188	1.3188	0.0849
S5	SH	180	2.6829	2.8278	2.9726	0.8927	0.985	1.0988	0.0734
S5	Diff (1-2)		-0.815	-0.593	-0.371	1.0223	1.0955	1.1801	0.1131

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
H1	Pooled	Equal	374	-2.44	0.0150
H1	Satterthwaite	Unequal	362	-2.43	0.0154
S1	Pooled	Equal	374	-2.49	0.0133
S1	Satterthwaite	Unequal	351	-2.47	0.0140
H2	Pooled	Equal	374	-2.96	0.0033
H2	Satterthwaite	Unequal	374	-2.96	0.0032
S2	Pooled	Equal	374	-6.49	<.0001
S2	Satterthwaite	Unequal	357	-6.46	<.0001
H3	Pooled	Equal	374	-6.87	<.0001
H3	Satterthwaite	Unequal	337	-6.99	<.0001
S3	Pooled	Equal	374	-6.70	<.0001
S3	Satterthwaite	Unequal	351	-6.66	<.0001
H4	Pooled	Equal	374	3.16	0.0017

Analysis 4-4

The TTEST Procedure

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
H4	Satterthwaite	Unequal	312	3.23	0.0014
S4	Pooled	Equal	374	-3.41	0.0007
S4	Satterthwaite	Unequal	355	-3.39	0.0008
H5	Pooled	Equal	374	-7.07	<.0001
H5	Satterthwaite	Unequal	371	-7.07	<.0001
S5	Pooled	Equal	374	-5.24	<.0001
S5	Satterthwaite	Unequal	370	-5.29	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
H1	Folded F	179	195	1.21	0.1968
S1	Folded F	179	195	1.42	0.0165
H2	Folded F	195	179	1.13	0.4029
S2	Folded F	179	195	1.31	0.0672
H3	Folded F	195	179	2.38	<.0001
S3	Folded F	179	195	1.42	0.0171
H4	Folded F	195	179	3.18	<.0001
S4	Folded F	179	195	1.35	0.0421
H5	Folded F	195	179	1.01	0.9726
S5	Folded F	195	179	1.45	0.0111

Analysis 4-5

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
D1	-1.2021277	-32.36	<.0001	-3.0000000	0	-1.0000000
D2	0.4175532	6.89	<.0001	-3.0000000	3.0000000	0
D3	-0.0797872	-1.93	0.0547	-2.0000000	2.0000000	0
D4	1.8164894	27.52	<.0001	-1.0000000	4.0000000	2.0000000
D5	-0.5824468	-11.00	<.0001	-3.0000000	2.0000000	0

Analysis 4-6

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
D1	HK	196	-1.31	-1.209	-1.108	0.6529	0.7176	0.7967	0.0513
D1	SH	180	-1.301	-1.194	-1.088	0.6574	0.7254	0.8092	0.0541
D1	Diff (1-2)		-0.161	-0.015	0.1317	0.6732	0.7214	0.7771	0.0745
D2	HK	196	0.4157	0.5867	0.7578	1.1048	1.2143	1.348	0.0867
D2	SH	180	0.0709	0.2333	0.3957	1.0006	1.1041	1.2316	0.0823
D2	Diff (1-2)		0.1173	0.3534	0.5895	1.0851	1.1628	1.2526	0.12
D3	HK	196	-0.267	-0.143	-0.018	0.8033	0.8829	0.9801	0.0631
D3	SH	180	-0.114	-0.011	0.092	0.6354	0.7011	0.7821	0.0523
D3	Diff (1-2)		-0.294	-0.132	0.0309	0.7475	0.801	0.8629	0.0827
D4	HK	196	1.9286	2.1122	2.2959	1.1863	1.3039	1.4475	0.0931
D4	SH	180	1.3217	1.4944	1.6672	1.0646	1.1747	1.3104	0.0876
D4	Diff (1-2)		0.3653	0.6178	0.8703	1.1606	1.2437	1.3397	0.1284
D5	HK	196	-0.728	-0.582	-0.435	0.948	1.0419	1.1567	0.0744
D5	SH	180	-0.732	-0.583	-0.434	0.9182	1.0132	1.1302	0.0755
D5	Diff (1-2)		-0.207	0.0017	0.2104	0.9596	1.0283	1.1076	0.1062

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
D1	Pooled	Equal	374	-0.20	0.8432
D1	Satterthwaite	Unequal	371	-0.20	0.8433
D2	Pooled	Equal	374	2.94	0.0034
D2	Satterthwaite	Unequal	374	2.96	0.0033
D3	Pooled	Equal	374	-1.59	0.1120
D3	Satterthwaite	Unequal	366	-1.61	0.1086
D4	Pooled	Equal	374	4.81	<.0001
D4	Satterthwaite	Unequal	374	4.83	<.0001
D5	Pooled	Equal	374	0.02	0.9872
D5	Satterthwaite	Unequal	373	0.02	0.9872

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
D1	Folded F	179	195	1.02	0.8813
D2	Folded F	195	179	1.21	0.1959
D3	Folded F	195	179	1.59	0.0018
D4	Folded F	195	179	1.23	0.1560
D5	Folded F	195	179	1.06	0.7044

Analysis 4-7

The PRINCOMP Procedure

Observations 376

Variables 5

Simple Statistics

	H1	H2	H3	H4	H5
Mean	3.140957447	3.409574468	2.978723404	4.287234043	1.936170213
StD	0.664387950	0.821260059	0.825961722	0.916484186	0.861731722

Correlation Matrix

	H1	H2	H3	H4	H5
H1	1.0000	0.2067	0.1561	0.0122	0.3977
H2	0.2067	1.0000	-.0500	-.0575	0.1237
H3	0.1561	-.0500	1.0000	-.1857	0.2903
H4	0.0122	-.0575	-.1857	1.0000	-.1591
H5	0.3977	0.1237	0.2903	-.1591	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.68047576	0.55313393	0.3361	0.3361
2	1.12734183	0.17165713	0.2255	0.5616
3	0.95568470	0.27245335	0.1911	0.7527
4	0.68323135	0.12996499	0.1366	0.8893
5	0.55326636		0.1107	1.0000

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5
H1	0.534253	0.383475	0.279654	-.264719	-.647486
H2	0.264617	0.589545	-.588890	0.470098	0.120958
H3	0.439700	-.501332	0.228694	0.698839	-.121049
H4	-.275937	0.504029	0.704229	0.345243	0.233843
H5	0.612433	-.002221	0.163594	-.318376	0.704837

Analysis 4-8

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
HK1	HK	196	-0.508	-0.376	-0.243	0.8574	0.9423	1.0461	0.0673
HK1	SH	180	0.277	0.409	0.541	0.8131	0.8972	1.0008	0.0669
HK1	Diff (1-2)		-0.972	-0.785	-0.598	0.8595	0.921	0.9921	0.0951
HK2	HK	196	-0.063	0.1014	0.2662	1.064	1.1695	1.2983	0.0835
HK2	SH	180	-0.223	-0.11	0.0017	0.6911	0.7626	0.8507	0.0568
HK2	Diff (1-2)		0.0098	0.2119	0.414	0.9292	0.9957	1.0726	0.1028

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
HK1	Pooled	Equal	374	-8.25	<.0001
HK1	Satterthwaite	Unequal	374	-8.27	<.0001
HK2	Pooled	Equal	374	2.06	0.0400
HK2	Satterthwaite	Unequal	338	2.10	0.0367

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
HK1	Folded F	195	179	1.10	0.5044
HK2	Folded F	195	179	2.35	<.0001

Analysis 4-9

The PRINCOMP Procedure

Observations	376
Variables	5

Simple Statistics

	S1	S2	S3	S4	S5
Mean	4.343085106	2.992021277	3.058510638	2.470744681	2.518617021
StD	0.594961111	0.945129358	0.642314079	0.929054274	1.133572148

Correlation Matrix

	S1	S2	S3	S4	S5
S1	1.0000	0.1092	0.0939	-.0373	0.0202
S2	0.1092	1.0000	0.3566	0.1288	0.0960
S3	0.0939	0.3566	1.0000	0.1682	0.0534
S4	-.0373	0.1288	0.1682	1.0000	-.0223
S5	0.0202	0.0960	0.0534	-.0223	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.49887546	0.44132261	0.2998	0.2998
2	1.05755285	0.07585399	0.2115	0.5113
3	0.98169886	0.15870908	0.1963	0.7076
4	0.82298978	0.18410672	0.1646	0.8722
5	0.63888306		0.1278	1.0000

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5
S1	0.237029	0.586544	-.606496	0.481382	0.014714
S2	0.626859	0.061844	0.016745	-.341604	-.697316
S3	0.629605	-.070915	-.048621	-.306526	0.708694
S4	0.348309	-.638217	0.056839	0.680047	-.075266
S5	0.182055	0.489685	0.791383	0.308473	0.074978

Analysis 4-10

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
SH1	HK	196	-0.547	-0.425	-0.304	0.7865	0.8644	0.9596	0.0617
SH1	SH	180	0.3263	0.4632	0.6002	0.8439	0.9312	1.0387	0.0694
SH1	Diff (1-2)		-1.071	-0.889	-0.707	0.837	0.897	0.9662	0.0926
SH2	HK	196	-0.223	-0.082	0.0585	0.9106	1.0008	1.1111	0.0715
SH2	SH	180	-0.056	0.0898	0.236	0.9009	0.9941	1.1089	0.0741
SH2	Diff (1-2)		-0.375	-0.172	0.0302	0.931	0.9976	1.0746	0.103

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
SH1	Pooled	Equal	374	-9.60	<.0001
SH1	Satterthwaite	Unequal	365	-9.57	<.0001
SH2	Pooled	Equal	374	-1.67	0.0951
SH2	Satterthwaite	Unequal	372	-1.67	0.0951

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
SH1	Folded F	179	195	1.16	0.3088
SH2	Folded F	195	179	1.01	0.9280

Analysis 4-11

The CORR Procedure

4 Variables: HK1 HK2 SH1 SH2

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	376	0	1.00000	0	-2.54947	2.29721
HK2	376	0	1.00000	0	-3.47685	3.04488
SH1	376	0	1.00000	0	-2.01497	2.71800
SH2	376	0	1.00000	0	-3.29450	1.88484

Pearson Correlation Coefficients, N = 376
Prob > |r| under H0: Rho=0

	HK1	HK2	SH1	SH2
HK1	1.00000	0.00000	0.25657	0.24741
		1.0000	<.0001	<.0001
HK2	0.00000	1.00000	-0.03379	0.32180
	1.0000		0.5137	<.0001
SH1	0.25657	-0.03379	1.00000	0.00000
	<.0001	0.5137		1.0000
SH2	0.24741	0.32180	0.00000	1.00000
	<.0001	<.0001	1.0000	

Analysis 4-12

---------- Sample=HK ----------

The CORR Procedure

4 Variables: HK1 HK2 SH1 SH2

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	196	-0.37561	0.94234	-73.61930	-2.54947	1.96301
HK2	196	0.10143	1.16945	19.87998	-2.12225	3.04488
SH1	196	-0.42540	0.86441	-83.37745	-2.01497	2.71800
SH2	196	-0.08249	1.00084	-16.16795	-3.29450	1.82121

Pearson Correlation Coefficients, N = 196

Prob > |r| under H0: Rho=0

	HK1	HK2	SH1	SH2
HK1	1.00000	-0.15047 0.0353	-0.14861 0.0376	0.22748 0.0013
HK2	-0.15047 0.0353	1.00000	-0.16838 0.0183	0.36180 <.0001
SH1	-0.14861 0.0376	-0.16838 0.0183	1.00000	-0.11359 0.1129
SH2	0.22748 0.0013	0.36180 <.0001	-0.11359 0.1129	1.00000

Analysis 4-13

---------- Sample=SH ----------

The CORR Procedure

4 Variables: HK1 HK2 SH1 SH2

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	180	0.40900	0.89716	73.61930	-1.31942	2.29721
HK2	180	-0.11044	0.76262	-19.87998	-3.47685	1.89671
SH1	180	0.46321	0.93117	83.37745	-1.61885	2.58682
SH2	180	0.08982	0.99408	16.16795	-2.81081	1.88484

Pearson Correlation Coefficients, N = 180

Prob > |r| under H0: Rho=0

	HK1	HK2	SH1	SH2
HK1	1.00000	0.39138 <.0001	0.36380 <.0001	0.23965 0.0012
HK2	0.39138 <.0001	1.00000	0.30042 <.0001	0.30599 <.0001
SH1	0.36380 <.0001	0.30042 <.0001	1.00000	0.02895 0.6997
SH2	0.23965 0.0012	0.30599 <.0001	0.02895 0.6997	1.00000

Data Output for Q5

Analysis 5-1

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	188.5000000	33.63	<.0001	1.0000000	376.0000000	188.5000000
H1	3.5106383	83.38	<.0001	1.0000000	5.0000000	4.0000000
S1	3.3989362	66.70	<.0001	2.0000000	5.0000000	4.0000000
H2	3.9069149	71.95	<.0001	1.0000000	5.0000000	4.0000000
S2	3.8829787	65.15	<.0001	1.0000000	5.0000000	4.0000000
H3	4.1808511	104.50	<.0001	2.0000000	5.0000000	4.0000000
S3	2.7978723	74.54	<.0001	1.0000000	5.0000000	3.0000000

Analysis 5-2

Sample=HK

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	98.5000000	24.31	<.0001	1.0000000	196.0000000	98.5000000
H1	3.5000000	76.98	<.0001	1.0000000	5.0000000	4.0000000
S1	3.0306122	45.74	<.0001	2.0000000	5.0000000	3.0000000
H2	3.6275510	50.17	<.0001	1.0000000	5.0000000	4.0000000
S2	3.6275510	45.99	<.0001	1.0000000	5.0000000	4.0000000
H3	4.0714286	68.51	<.0001	2.0000000	5.0000000	4.0000000
S3	2.6581633	50.93	<.0001	1.0000000	4.0000000	3.0000000

Sample=SH

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	286.5000000	73.77	<.0001	197.0000000	376.0000000	286.5000000
H1	3.5222222	48.36	<.0001	1.0000000	5.0000000	4.0000000
S1	3.8000000	57.08	<.0001	2.0000000	5.0000000	4.0000000
H2	4.2111111	55.73	<.0001	1.0000000	5.0000000	4.0000000
S2	4.1611111	48.59	<.0001	1.0000000	5.0000000	4.0000000
H3	4.3000000	83.33	<.0001	2.0000000	5.0000000	4.0000000
S3	2.9500000	56.92	<.0001	2.0000000	5.0000000	3.0000000

Analysis 5-3

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
H1	HK	196	3.4103	3.5	3.5897	0.5791	0.6365	0.7066	0.0455
H1	SH	180	3.3785	3.5222	3.6659	0.8856	0.9771	1.09	0.0728
H1	Diff (1-2)		-0.188	-0.022	0.1437	0.7628	0.8174	0.8805	0.0844
S1	HK	196	2.8999	3.0306	3.1613	0.844	0.9277	1.0299	0.0663
S1	SH	180	3.6686	3.8	3.9314	0.8095	0.8932	0.9964	0.0666
S1	Diff (1-2)		-0.954	-0.769	-0.584	0.8504	0.9113	0.9817	0.0941
H2	HK	196	3.485	3.6276	3.7702	0.921	1.0123	1.1238	0.0723
H2	SH	180	4.062	4.2111	4.3602	0.9188	1.0138	1.1309	0.0756
H2	Diff (1-2)		-0.789	-0.584	-0.378	0.9453	1.013	1.0912	0.1046
S2	HK	196	3.472	3.6276	3.7831	1.0048	1.1043	1.226	0.0789
S2	SH	180	3.9921	4.1611	4.3301	1.0413	1.149	1.2818	0.0856
S2	Diff (1-2)		-0.762	-0.534	-0.305	1.0507	1.1259	1.2129	0.1162
H3	HK	196	3.9542	4.0714	4.1886	0.757	0.8321	0.9237	0.0594
H3	SH	180	4.1982	4.3	4.4018	0.6274	0.6923	0.7723	0.0516
H3	Diff (1-2)		-0.385	-0.229	-0.073	0.717	0.7684	0.8277	0.0793
S3	HK	196	2.5552	2.6582	2.7611	0.6648	0.7306	0.8111	0.0522
S3	SH	180	2.8477	2.95	3.0523	0.6302	0.6954	0.7757	0.0518
S3	Diff (1-2)		-0.437	-0.292	-0.147	0.6663	0.714	0.7691	0.0737

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
H1	Pooled	Equal	374	-0.26	0.7924
H1	Satterthwaite	Unequal	303	-0.26	0.7959
S1	Pooled	Equal	374	-8.18	<.0001
S1	Satterthwaite	Unequal	373	-8.19	<.0001
H2	Pooled	Equal	374	-5.58	<.0001
H2	Satterthwaite	Unequal	371	-5.58	<.0001
S2	Pooled	Equal	374	-4.59	<.0001
S2	Satterthwaite	Unequal	368	-4.58	<.0001
H3	Pooled	Equal	374	-2.88	0.0042
H3	Satterthwaite	Unequal	370	-2.90	0.0039
S3	Pooled	Equal	374	-3.96	<.0001
S3	Satterthwaite	Unequal	374	-3.97	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
H1	Folded F	179	195	2.36	<.0001
S1	Folded F	195	179	1.08	0.6067
H2	Folded F	179	195	1.00	0.9817
S2	Folded F	179	195	1.08	0.5867
H3	Folded F	195	179	1.44	0.0127
S3	Folded F	195	179	1.10	0.5012

Analysis 5-4

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
D1	0.1117021	1.84	0.0665	-3.0000000	2.0000000	0
D2	0.0239362	0.56	0.5737	-4.0000000	4.0000000	0
D3	1.3829787	25.75	<.0001	-2.0000000	4.0000000	1.0000000

Analysis 5-5

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
D1	HK	196	0.3148	0.4694	0.624	0.9984	1.0974	1.2182	0.0784
D1	SH	180	-0.445	-0.278	-0.11	1.032	1.1387	1.2703	0.0849
D1	Diff (1-2)		0.5203	0.7472	0.974	1.0427	1.1173	1.2036	0.1154
D2	HK	196	-0.082	0	0.082	0.5293	0.5818	0.6459	0.0416
D2	SH	180	-0.101	0.05	0.201	0.9301	1.0263	1.1449	0.0765
D2	Diff (1-2)		-0.217	-0.05	0.1175	0.7699	0.825	0.8887	0.0852
D3	HK	196	1.2526	1.4133	1.5739	1.0374	1.1402	1.2658	0.0814
D3	SH	180	1.214	1.35	1.486	0.8377	0.9244	1.0312	0.0689
D3	Diff (1-2)		-0.148	0.0633	0.2749	0.9729	1.0425	1.123	0.1076

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
D1	Pooled	Equal	374	6.48	<.0001
D1	Satterthwaite	Unequal	368	6.47	<.0001
D2	Pooled	Equal	374	-0.59	0.5575
D2	Satterthwaite	Unequal	278	-0.57	0.5662
D3	Pooled	Equal	374	0.59	0.5570
D3	Satterthwaite	Unequal	368	0.59	0.5535

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
D1	Folded F	179	195	1.08	0.6119
D2	Folded F	179	195	3.11	<.0001
D3	Folded F	195	179	1.52	0.0045

Analysis 5-6

The PRINCOMP Procedure

Observations	376
Variables	3

Simple Statistics

	H1	H2	H3
Mean	3.510638298	3.906914894	4.180851064
StD	0.816427089	1.052922310	0.775804318

Correlation Matrix

	H1	H2	H3
H1	1.0000	0.1020	0.2959
H2	0.1020	1.0000	0.1708
H3	0.2959	0.1708	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.39171543	0.47782800	0.4639	0.4639
2	0.91388743	0.21949029	0.3046	0.7685
3	0.69439714		0.2315	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
H1	0.610675	-.455583	0.647704
H2	0.444719	0.874071	0.195511
H3	0.655211	-.168653	-.736380

Analysis 5-7

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
HK1	HK	196	-0.304	-0.185	-0.066	0.7678	0.8439	0.9369	0.0603
HK1	SH	180	0.0377	0.2016	0.3654	1.0095	1.1139	1.2426	0.083
HK1	Diff (1-2)		-0.586	-0.387	-0.187	0.9168	0.9824	1.0583	0.1014

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
HK1	Pooled	Equal	374	-3.81	0.0002
HK1	Satterthwaite	Unequal	333	-3.77	0.0002

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
HK1	Folded F	179	195	1.74	<.0001

Analysis 5-8

The PRINCOMP Procedure

Observations	376
Variables	3

Simple Statistics

	S1	S2	S3
Mean	3.398936170	3.882978723	2.797872340
StD	0.988142465	1.155682844	0.727806381

Correlation Matrix

	S1	S2	S3
S1	1.0000	0.3983	-.0248
S2	0.3983	1.0000	0.1779
S3	-.0248	0.1779	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.42738282	0.40896110	0.4758	0.4758
2	1.01842173	0.46422628	0.3395	0.8153
3	0.55419545		0.1847	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
S1	0.650302	-.406050	0.642052
S2	0.713989	0.038011	-.699124
S3	0.259474	0.913060	0.314634

Analysis 5-9

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
SH1	HK	196	-0.512	-0.377	-0.242	0.872	0.9584	1.064	0.0685
SH1	SH	180	0.2811	0.4101	0.5392	0.7951	0.8774	0.9787	0.0654
SH1	Diff (1-2)		-0.974	-0.787	-0.6	0.859	0.9205	0.9916	0.095
SH2	HK	196	-0.174	-0.032	0.1098	0.9158	1.0065	1.1174	0.0719
SH2	SH	180	-0.111	0.0349	0.1811	0.9012	0.9944	1.1093	0.0741
SH2	Diff (1-2)		-0.27	-0.067	0.1363	0.9339	1.0008	1.078	0.1033

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
SH1	Pooled	Equal	374	-8.28	<.0001
SH1	Satterthwaite	Unequal	374	-8.31	<.0001
SH2	Pooled	Equal	374	-0.65	0.5177
SH2	Satterthwaite	Unequal	372	-0.65	0.5175

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
SH1	Folded F	195	179	1.19	0.2295
SH2	Folded F	195	179	1.02	0.8706

Analysis 5-10

The CORR Procedure

3 Variables: HK1 SH1 SH2

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	376	0	1.00000	0	-3.20181	1.92210
SH1	376	0	1.00000	0	-2.49950	2.11668
SH2	376	0	1.00000	0	-2.91572	3.31100

Pearson Correlation Coefficients, N = 376

Prob > |r| under H0: Rho=0

	HK1	SH1	SH2
HK1	1.00000	0.38159	-0.15093
		<.0001	0.0033
SH1	0.38159	1.00000	0.00000
	<.0001		1.0000
SH2	-0.15093	0.00000	1.00000
	0.0033	1.0000	

Analysis 5-11

---------- Sample=HK ----------

The CORR Procedure

3 Variables: HK1 SH1 SH2

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	196	-0.18510	0.84394	-36.27968	-2.48576	0.93003
SH1	196	-0.37666	0.95844	-73.82569	-2.49950	1.30116
SH2	196	-0.03203	1.00655	-6.27696	-2.91572	2.06786

Pearson Correlation Coefficients, N = 196

Prob > |r| under H0: Rho=0

	HK1	SH1	SH2
HK1	1.00000	0.13280	-0.09581
		0.0635	0.1816
SH1	0.13280	1.00000	0.21884
	0.0635		0.0021
SH2	-0.09581	0.21884	1.00000
	0.1816	0.0021	

Analysis 5-12

---------- Sample=SH ----------

The CORR Procedure

3 Variables: HK1 SH1 SH2

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	180	0.20155	1.11387	36.27968	-3.20181	1.92210
SH1	180	0.41014	0.87736	73.82569	-2.49950	2.11668
SH2	180	0.03487	0.99445	6.27696	-1.70517	3.31100

Pearson Correlation Coefficients, N = 180

Prob > |r| under H0: Rho=0

	HK1	SH1	SH2
HK1	1.00000	0.53510	-0.21765
		<.0001	0.0033
SH1	0.53510	1.00000	-0.29522
	<.0001		<.0001
SH2	-0.21765	-0.29522	1.00000
	0.0033	<.0001	

Data Output for Q6

Analysis 6-1

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	188.5000000	33.63	<.0001	1.0000000	376.0000000	188.5000000
H1	4.6010638	139.15	<.0001	1.0000000	5.0000000	5.0000000
S1	3.8111702	92.84	<.0001	1.0000000	5.0000000	4.0000000
H2	4.5611702	141.46	<.0001	1.0000000	5.0000000	5.0000000
S2	3.2420213	81.53	<.0001	1.0000000	5.0000000	3.0000000
H3	4.5026596	150.63	<.0001	2.0000000	5.0000000	5.0000000
S3	2.9867021	73.48	<.0001	1.0000000	5.0000000	3.0000000

Analysis 6-2

Sample=HK

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	98.5000000	24.31	<.0001	1.0000000	196.0000000	98.5000000
H1	4.8673469	142.56	<.0001	1.0000000	5.0000000	5.0000000
S1	3.7602041	65.04	<.0001	2.0000000	5.0000000	4.0000000
H2	4.7857143	131.01	<.0001	2.0000000	5.0000000	5.0000000
S2	3.2142857	50.80	<.0001	1.0000000	5.0000000	3.0000000
H3	4.6683673	127.25	<.0001	2.0000000	5.0000000	5.0000000
S3	3.0306122	49.41	<.0001	1.0000000	5.0000000	3.0000000

Sample=SH

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	286.5000000	73.77	<.0001	197.0000000	376.0000000	286.5000000
H1	4.3111111	86.21	<.0001	2.0000000	5.0000000	4.0000000
S1	3.8666667	66.54	<.0001	1.0000000	5.0000000	4.0000000
H2	4.3166667	89.50	<.0001	1.0000000	5.0000000	4.0000000
S2	3.2722222	70.37	<.0001	2.0000000	5.0000000	3.0000000
H3	4.3222222	97.51	<.0001	2.0000000	5.0000000	4.0000000
S3	2.9388889	56.13	<.0001	2.0000000	5.0000000	3.0000000

Analysis 6-3

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
H1	HK	196	4.8	4.8673	4.9347	0.4349	0.478	0.5306	0.0341
H1	SH	180	4.2124	4.3111	4.4098	0.608	0.6709	0.7484	0.05
H1	Diff (1-2)		0.4388	0.5562	0.6737	0.5398	0.5784	0.6231	0.0597
S1	HK	196	3.6462	3.7602	3.8742	0.7364	0.8093	0.8985	0.0578
S1	SH	180	3.752	3.8667	3.9813	0.7066	0.7796	0.8697	0.0581
S1	Diff (1-2)		-0.268	-0.106	0.055	0.7421	0.7953	0.8566	0.0821
H2	HK	196	4.7137	4.7857	4.8578	0.4653	0.5114	0.5677	0.0365
H2	SH	180	4.2215	4.3167	4.4118	0.5864	0.6471	0.7218	0.0482
H2	Diff (1-2)		0.3512	0.469	0.5868	0.5415	0.5803	0.6251	0.0599
S2	HK	196	3.0895	3.2143	3.3391	0.8059	0.8858	0.9834	0.0633
S2	SH	180	3.1805	3.2722	3.364	0.5654	0.6238	0.6959	0.0465
S2	Diff (1-2)		-0.215	-0.058	0.0987	0.72	0.7716	0.8312	0.0797
H3	HK	196	4.596	4.6684	4.7407	0.4673	0.5136	0.5702	0.0367
H3	SH	180	4.2347	4.3222	4.4097	0.539	0.5947	0.6634	0.0443
H3	Diff (1-2)		0.2337	0.3461	0.4586	0.5169	0.5539	0.5967	0.0572
S3	HK	196	2.9096	3.0306	3.1516	0.7814	0.8588	0.9534	0.0613
S3	SH	180	2.8356	2.9389	3.0422	0.6366	0.7025	0.7836	0.0524
S3	Diff (1-2)		-0.068	0.0917	0.2517	0.7352	0.7878	0.8487	0.0813

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
H1	Pooled	Equal	374	9.32	<.0001
H1	Satterthwaite	Unequal	321	9.19	<.0001
S1	Pooled	Equal	374	-1.30	0.1955
S1	Satterthwaite	Unequal	373	-1.30	0.1948
H2	Pooled	Equal	374	7.83	<.0001
H2	Satterthwaite	Unequal	340	7.75	<.0001
S2	Pooled	Equal	374	-0.73	0.4675
S2	Satterthwaite	Unequal	351	-0.74	0.4611
H3	Pooled	Equal	374	6.05	<.0001
H3	Satterthwaite	Unequal	355	6.02	<.0001
S3	Pooled	Equal	374	1.13	0.2602
S3	Satterthwaite	Unequal	369	1.14	0.2561

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
H1	Folded F	179	195	1.97	<.0001
S1	Folded F	195	179	1.08	0.6116
H2	Folded F	179	195	1.60	0.0013
S2	Folded F	195	179	2.02	<.0001
H3	Folded F	179	195	1.34	0.0452
S3	Folded F	195	179	1.49	0.0065

Analysis 6-4

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
D1	0.7898936	16.47	<.0001	-3.0000000	4.0000000	1.0000000
D2	1.3191489	24.90	<.0001	-3.0000000	4.0000000	1.0000000
D3	1.5159574	33.09	<.0001	-1.0000000	4.0000000	1.0000000

Analysis 6-5

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
D1	HK	196	0.9858	1.1071	1.2285	0.7839	0.8616	0.9565	0.0615
D1	SH	180	0.3151	0.4444	0.5738	0.797	0.8795	0.981	0.0656
D1	Diff (1-2)		0.4861	0.6627	0.8393	0.812	0.8702	0.9374	0.0898
D2	HK	196	1.4252	1.5714	1.7176	0.9442	1.0377	1.1521	0.0741
D2	SH	180	0.9055	1.0444	1.1833	0.8559	0.9444	1.0535	0.0704
D2	Diff (1-2)		0.3252	0.527	0.7288	0.9277	0.9942	1.0709	0.1026
D3	HK	196	1.5162	1.6378	1.7593	0.7853	0.8632	0.9582	0.0617
D3	SH	180	1.2512	1.3833	1.5155	0.8144	0.8986	1.0024	0.067
D3	Diff (1-2)		0.0757	0.2544	0.4331	0.8215	0.8803	0.9483	0.0909

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
D1	Pooled	Equal	374	7.38	<.0001
D1	Satterthwaite	Unequal	370	7.37	<.0001
D2	Pooled	Equal	374	5.13	<.0001
D2	Satterthwaite	Unequal	374	5.16	<.0001
D3	Pooled	Equal	374	2.80	0.0054
D3	Satterthwaite	Unequal	368	2.79	0.0055

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
D1	Folded F	179	195	1.04	0.7777
D2	Folded F	195	179	1.21	0.2000
D3	Folded F	179	195	1.08	0.5810

Analysis 6-6

The PRINCOMP Procedure

Observations 376
Variables 3

Simple Statistics

	H1	H2	H3
Mean	4.601063830	4.561170213	4.502659574
StD	0.641164720	0.625231872	0.579648952

Correlation Matrix

	H1	H2	H3
H1	1.0000	0.4202	0.1535
H2	0.4202	1.0000	0.2644
H3	0.1535	0.2644	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.57407214	0.70963666	0.5247	0.5247
2	0.86443548	0.30294311	0.2881	0.8128
3	0.56149237		0.1872	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
H1	0.601098	-.489687	0.631576
H2	0.652554	-.155486	-.741618
H3	0.461361	0.857923	0.226085

Analysis 6-7

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
HK1	HK	196	0.3848	0.4909	0.597	0.6851	0.753	0.836	0.0538
HK1	SH	180	-0.676	-0.535	-0.393	0.8721	0.9623	1.0735	0.0717
HK1	Diff (1-2)		0.8509	1.0254	1.1999	0.8021	0.8596	0.9259	0.0887

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
HK1	Pooled	Equal	374	11.56	<.0001
HK1	Satterthwaite	Unequal	339	11.44	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
HK1	Folded F	179	195	1.63	0.0008

Analysis 6-8

The PRINCOMP Procedure

Observations 376
Variables 3

Simple Statistics

	S1	S2	S3
Mean	3.811170213	3.242021277	2.986702128
StD	0.795978367	0.771104945	0.788134524

Correlation Matrix

	S1	S2	S3
S1	1.0000	0.4874	0.4763
S2	0.4874	1.0000	0.6152
S3	0.4763	0.6152	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.05528913	1.49509547	0.6851	0.6851
2	0.56019367	0.17567647	0.1867	0.8718
3	0.38451720		0.1282	1.0000

Eigenvectors

	Prin1	Prin2	Prin3
S1	0.542488	0.839421	0.032857
S2	0.595810	-.356889	-.719472
S3	0.592214	-.409881	0.693744

Analysis 6-9

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
SH1	HK	196	-0.176	-0.016	0.1438	1.0334	1.1358	1.2609	0.0811
SH1	SH	180	-0.104	0.0176	0.1397	0.7522	0.83	0.9259	0.0619
SH1	Diff (1-2)		-0.237	-0.034	0.1695	0.9343	1.0012	1.0785	0.1034

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
SH1	Pooled	Equal	374	-0.33	0.7441
SH1	Satterthwaite	Unequal	356	-0.33	0.7409

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
SH1	Folded F	195	179	1.87	<.0001

Analysis 6-10

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	376	0	1.00000	0	-2.98327	0.97867
SH1	376	0	1.00000	0	-1.57219	2.56788

Pearson Correlation Coefficients, N = 376

Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.13796 0.0074
SH1	0.13796 0.0074	1.00000

Analysis 6-11

---------- Sample=HK ----------

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	196	0.49090	0.75304	96.21617	-2.17959	0.97867
SH1	196	-0.01616	1.13582	-3.16786	-1.57219	2.56788

Pearson Correlation Coefficients, N = 196

Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.23991 0.0007
SH1	0.23991 0.0007	1.00000

Analysis 6-12

---------- Sample=SH ----------

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	180	-0.53453	0.96230	-96.21617	-2.98327	0.97867
SH1	180	0.01760	0.83004	3.16786	-1.57219	1.55353

Pearson Correlation Coefficients, N = 180

Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.10470 0.1619
SH1	0.10470 0.1619	1.00000

Data Output for Q7

Analysis 7-1

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	188.5000000	33.63	<.0001	1.0000000	376.0000000	188.5000000
H1	4.3776596	134.05	<.0001	2.0000000	5.0000000	4.0000000
S1	3.0930851	75.33	<.0001	1.0000000	5.0000000	3.0000000
H2	4.4042553	148.19	<.0001	2.0000000	5.0000000	4.0000000
S2	3.2260638	76.65	<.0001	1.0000000	5.0000000	3.0000000

Analysis 7-2

---------- Sample=HK ----------

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	98.5000000	24.31	<.0001	1.0000000	196.0000000	98.5000000
H1	4.4591837	92.58	<.0001	2.0000000	5.0000000	5.0000000
S1	3.1071429	56.71	<.0001	1.0000000	4.0000000	3.0000000
H2	4.4795918	114.09	<.0001	2.0000000	5.0000000	4.5000000
S2	3.0306122	59.30	<.0001	1.0000000	5.0000000	3.0000000

---------- Sample=SH ----------

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	286.5000000	73.77	<.0001	197.0000000	376.0000000	286.5000000
H1	4.2888889	100.25	<.0001	2.0000000	5.0000000	4.0000000
S1	3.0777778	49.83	<.0001	1.0000000	5.0000000	3.0000000
H2	4.3222222	97.51	<.0001	2.0000000	5.0000000	4.0000000
S2	3.4388889	53.26	<.0001	2.0000000	5.0000000	3.0000000

Analysis 7-3

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
H1	HK	196	4.3642	4.4592	4.5542	0.6135	0.6743	0.7486	0.0482
H1	SH	180	4.2045	4.2889	4.3733	0.5202	0.574	0.6403	0.0428
H1	Diff (1-2)		0.0427	0.1703	0.2978	0.5863	0.6283	0.6768	0.0649
S1	HK	196	2.9991	3.1071	3.2152	0.6979	0.7671	0.8516	0.0548
S1	SH	180	2.9559	3.0778	3.1997	0.751	0.8286	0.9244	0.0618
S1	Diff (1-2)		-0.132	0.0294	0.1912	0.7439	0.7972	0.8587	0.0823
H2	HK	196	4.4022	4.4796	4.557	0.5001	0.5497	0.6102	0.0393
H2	SH	180	4.2347	4.3222	4.4097	0.539	0.5947	0.6634	0.0443
H2	Diff (1-2)		0.0413	0.1574	0.2734	0.5335	0.5717	0.6158	0.059
S2	HK	196	2.9298	3.0306	3.1314	0.6509	0.7155	0.7943	0.0511
S2	SH	180	3.3115	3.4389	3.5663	0.7851	0.8663	0.9664	0.0646
S2	Diff (1-2)		-0.569	-0.408	-0.248	0.7384	0.7912	0.8523	0.0817

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
H1	Pooled	Equal	374	2.63	0.0090
H1	Satterthwaite	Unequal	372	2.64	0.0086
S1	Pooled	Equal	374	0.36	0.7214
S1	Satterthwaite	Unequal	364	0.36	0.7223
H2	Pooled	Equal	374	2.67	0.0080
H2	Satterthwaite	Unequal	364	2.66	0.0082
S2	Pooled	Equal	374	-5.00	<.0001
S2	Satterthwaite	Unequal	348	-4.96	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
H1	Folded F	195	179	1.38	0.0288
S1	Folded F	179	195	1.17	0.2912
H2	Folded F	179	195	1.17	0.2813
S2	Folded F	179	195	1.47	0.0090

Analysis 7-4

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
D1	1.2845745	28.80	<.0001	-1.0000000	4.0000000	1.0000000
D2	1.1781915	27.92	<.0001	0	4.0000000	1.0000000

Analysis 7-5

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
D1	HK	196	1.2195	1.352	1.4846	0.8563	0.9411	1.0448	0.0672
D1	SH	180	1.0979	1.2111	1.3243	0.6973	0.7695	0.8583	0.0574
D1	Diff (1-2)		-0.034	0.1409	0.3162	0.8055	0.8632	0.9299	0.0891
D2	HK	196	1.3401	1.449	1.5579	0.7032	0.7729	0.858	0.0552
D2	SH	180	0.7709	0.8833	0.9957	0.6926	0.7643	0.8525	0.057
D2	Diff (1-2)		0.4096	0.5656	0.7217	0.7174	0.7688	0.8281	0.0794

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
D1	Pooled	Equal	374	1.58	0.1146
D1	Satterthwaite	Unequal	369	1.59	0.1116
D2	Pooled	Equal	374	7.13	<.0001
D2	Satterthwaite	Unequal	372	7.13	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
D1	Folded F	195	179	1.50	0.0064
D2	Folded F	195	179	1.02	0.8795

Analysis 7-6

The PRINCOMP Procedure

Observations 376
Variables 2

Simple Statistics

	H1	H2
Mean	4.377659574	4.404255319
StD	0.633240008	0.576317485

Correlation Matrix

	H1	H2
H1	1.0000	0.4282
H2	0.4282	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.42815860	0.85631719	0.7141	0.7141
2	0.57184140		0.2859	1.0000

Eigenvectors

	Prin1	Prin2
H1	0.707107	0.707107
H2	0.707107	-.707107

Analysis 7-7

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
HK1	HK	196	0.0079	0.1535	0.2991	0.9403	1.0335	1.1473	0.0738
HK1	SH	180	-0.305	-0.167	-0.029	0.8489	0.9367	1.045	0.0698
HK1	Diff (1-2)		0.1201	0.3207	0.5213	0.9223	0.9884	1.0647	0.102

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
HK1	Pooled	Equal	374	3.14	0.0018
HK1	Satterthwaite	Unequal	374	3.16	0.0017

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
HK1	Folded F	195	179	1.22	0.1815

Analysis 7-8

The PRINCOMP Procedure

Observations 376
Variables 2

Simple Statistics

	S1	S2
Mean	3.093085106	3.226063830
StD	0.796227809	0.816144717

Correlation Matrix

	S1	S2
S1	1.0000	0.5256
S2	0.5256	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	1.52561998	1.05123997	0.7628	0.7628
2	0.47438002		0.2372	1.0000

Eigenvectors

	Prin1	Prin2
S1	0.707107	0.707107
S2	0.707107	-.707107

Analysis 7-9

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
SH1	HK	196	-0.256	-0.127	0.0023	0.8351	0.9178	1.0189	0.0656
SH1	SH	180	-0.019	0.1383	0.2953	0.9678	1.0679	1.1913	0.0796
SH1	Diff (1-2)		-0.467	-0.265	-0.064	0.9262	0.9925	1.0691	0.1025

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
SH1	Pooled	Equal	374	-2.59	0.0100
SH1	Satterthwaite	Unequal	354	-2.57	0.0105

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
SH1	Folded F	179	195	1.35	0.0386

Analysis 7-10

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	376	0	1.00000	0	-2.82128	1.19315
SH1	376	0	1.00000	0	-2.36493	1.91393

Pearson Correlation Coefficients, N = 376
Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.31811 <.0001
SH1	0.31811 <.0001	1.00000

Analysis 7-11

---------- Sample=HK ----------

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	196	0.15352	1.03349	30.09028	-2.82128	1.19315
SH1	196	-0.12699	0.91783	-24.89032	-2.36493	1.19494

Pearson Correlation Coefficients, N = 196

Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.13065 0.0680
SH1	0.13065 0.0680	1.00000

Analysis 7-12

---------- Sample=SH ----------

The CORR Procedure

2 Variables: HK1 SH1

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	180	-0.16717	0.93674	-30.09028	-2.82128	1.19315
SH1	180	0.13828	1.06789	24.89032	-1.66348	1.91393

Pearson Correlation Coefficients, N = 180

Prob > |r| under H0: Rho=0

	HK1	SH1
HK1	1.00000	0.57582 <.0001
SH1	0.57582 <.0001	1.00000

Data Output for Q8

Analysis 8-1

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	188.5000000	33.63	<.0001	1.0000000	376.0000000	188.5000000
H1	3.2845745	87.97	<.0001	1.0000000	5.0000000	3.0000000
S1	3.6515957	110.01	<.0001	2.0000000	5.0000000	4.0000000
H2	4.1968085	118.31	<.0001	1.0000000	5.0000000	4.0000000
S2	3.9255319	120.39	<.0001	2.0000000	5.0000000	4.0000000
H3	4.0877660	104.90	<.0001	1.0000000	5.0000000	4.0000000
S3	3.8856383	114.61	<.0001	1.0000000	5.0000000	4.0000000
H4	4.4787234	116.66	<.0001	1.0000000	5.0000000	5.0000000
S4	3.6542553	99.27	<.0001	1.0000000	5.0000000	4.0000000
H5	4.1170213	118.97	<.0001	2.0000000	5.0000000	4.0000000
S5	3.8164894	89.51	<.0001	1.0000000	5.0000000	4.0000000
H6	4.4388298	114.32	<.0001	2.0000000	5.0000000	5.0000000
S6	3.6675532	92.13	<.0001	1.0000000	5.0000000	4.0000000
H7	4.4734043	115.99	<.0001	1.0000000	5.0000000	5.0000000
S7	3.5292553	81.00	<.0001	1.0000000	5.0000000	4.0000000
H8	4.5691489	117.23	<.0001	1.0000000	5.0000000	5.0000000
S8	4.0000000	109.54	<.0001	2.0000000	5.0000000	4.0000000
H9	3.0930851	56.69	<.0001	1.0000000	5.0000000	3.0000000
S9	3.4734043	77.98	<.0001	1.0000000	5.0000000	4.0000000
H10	3.9202128	95.10	<.0001	1.0000000	5.0000000	4.0000000
S10	4.2632979	123.90	<.0001	1.0000000	5.0000000	4.0000000
H11	3.3936170	92.51	<.0001	1.0000000	5.0000000	3.0000000
S11	4.2606383	114.14	<.0001	1.0000000	5.0000000	4.0000000
H12	3.3643617	123.24	<.0001	2.0000000	5.0000000	3.0000000
S12	3.4122340	77.82	<.0001	1.0000000	5.0000000	3.0000000
H13	3.9654255	109.02	<.0001	1.0000000	5.0000000	4.0000000
S13	3.5691489	83.41	<.0001	1.0000000	5.0000000	3.0000000

Analysis 8-2

Sample=HK

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	98.5000000	24.31	<.0001	1.0000000	196.0000000	98.5000000
H1	3.3010204	55.09	<.0001	1.0000000	5.0000000	3.0000000
S1	3.5153061	94.44	<.0001	2.0000000	4.0000000	4.0000000
H2	4.4285714	85.73	<.0001	1.0000000	5.0000000	5.0000000
S2	3.9897959	80.46	<.0001	2.0000000	5.0000000	4.0000000
H3	3.8571429	91.44	<.0001	1.0000000	5.0000000	4.0000000
S3	3.7346939	79.57	<.0001	1.0000000	5.0000000	4.0000000
H4	4.6530612	91.70	<.0001	1.0000000	5.0000000	5.0000000
S4	3.5306122	74.08	<.0001	1.0000000	5.0000000	3.0000000
H5	4.2244898	95.93	<.0001	2.0000000	5.0000000	4.0000000
S5	3.4591837	61.06	<.0001	1.0000000	5.0000000	3.0000000
H6	4.4438776	80.53	<.0001	2.0000000	5.0000000	5.0000000
S6	3.6734694	70.73	<.0001	2.0000000	5.0000000	4.0000000
H7	4.5561224	99.35	<.0001	2.0000000	5.0000000	5.0000000
S7	3.4336735	54.78	<.0001	1.0000000	5.0000000	4.0000000
H8	4.4795918	82.41	<.0001	1.0000000	5.0000000	5.0000000
S8	3.7244898	90.23	<.0001	2.0000000	5.0000000	4.0000000
H9	3.3418367	37.22	<.0001	1.0000000	5.0000000	3.0000000
S9	3.6020408	53.55	<.0001	1.0000000	5.0000000	4.0000000
H10	3.8469388	60.72	<.0001	1.0000000	5.0000000	4.0000000
S10	4.1275510	97.99	<.0001	2.0000000	5.0000000	4.0000000
H11	3.2346939	72.92	<.0001	1.0000000	4.0000000	3.0000000
S11	4.1020408	75.79	<.0001	1.0000000	5.0000000	4.0000000
H12	3.3061224	91.74	<.0001	2.0000000	5.0000000	3.0000000
S12	3.5918367	52.73	<.0001	1.0000000	5.0000000	3.0000000
H13	4.2142857	81.18	<.0001	2.0000000	5.0000000	4.0000000
S13	3.7040816	56.40	<.0001	2.0000000	5.0000000	3.0000000

Sample=SH

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
Obs	286.5000000	73.77	<.0001	197.0000000	376.0000000	286.5000000
H1	3.2666667	76.21	<.0001	1.0000000	4.0000000	3.0000000
S1	3.8000000	70.06	<.0001	2.0000000	5.0000000	4.0000000
H2	3.9444444	96.85	<.0001	1.0000000	5.0000000	4.0000000
S2	3.8555556	93.97	<.0001	2.0000000	5.0000000	4.0000000
H3	4.3388889	69.85	<.0001	1.0000000	5.0000000	4.0000000
S3	4.0500000	87.80	<.0001	1.0000000	5.0000000	4.0000000
H4	4.2888889	78.18	<.0001	1.0000000	5.0000000	4.0000000
S4	3.7888889	68.71	<.0001	1.0000000	5.0000000	4.0000000
H5	4.0000000	75.68	<.0001	3.0000000	5.0000000	4.0000000
S5	4.2055556	83.67	<.0001	2.0000000	5.0000000	4.0000000
H6	4.4333333	81.13	<.0001	2.0000000	5.0000000	5.0000000
S6	3.6611111	59.91	<.0001	1.0000000	5.0000000	4.0000000
H7	4.3833333	69.94	<.0001	1.0000000	5.0000000	5.0000000
S7	3.6333333	61.14	<.0001	1.0000000	5.0000000	4.0000000

Analysis 8-3

---------- Sample=SH ----------

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
H8	4.6666667	84.62	<.0001	2.0000000	5.0000000	5.0000000
S8	4.3000000	80.56	<.0001	2.0000000	5.0000000	4.0000000
H9	2.8222222	54.53	<.0001	1.0000000	4.0000000	3.0000000
S9	3.3333333	59.83	<.0001	1.0000000	4.0000000	3.0000000
H10	4.0000000	78.34	<.0001	1.0000000	5.0000000	4.0000000
S10	4.4111111	82.74	<.0001	1.0000000	5.0000000	4.0000000
H11	3.5666667	62.72	<.0001	2.0000000	5.0000000	4.0000000
S11	4.4333333	92.38	<.0001	2.0000000	5.0000000	4.0000000
H12	3.4277778	83.68	<.0001	2.0000000	5.0000000	3.0000000
S12	3.2166667	64.33	<.0001	1.0000000	4.0000000	3.0000000
H13	3.6944444	86.93	<.0001	1.0000000	4.0000000	4.0000000
S13	3.4222222	66.27	<.0001	1.0000000	4.0000000	4.0000000

Analysis 8-4

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
H1	HK	196	3.1828	3.301	3.4192	0.7633	0.8389	0.9313	0.0599
H1	SH	180	3.1821	3.2667	3.3513	0.5212	0.5751	0.6415	0.0429
H1	Diff (1-2)		-0.113	0.0344	0.1815	0.6763	0.7247	0.7807	0.0748
S1	HK	196	3.4419	3.5153	3.5887	0.4741	0.5211	0.5785	0.0372
S1	SH	180	3.693	3.8	3.907	0.6595	0.7277	0.8118	0.0542
S1	Diff (1-2)		-0.412	-0.285	-0.157	0.5865	0.6285	0.6771	0.0649
H2	HK	196	4.3267	4.4286	4.5305	0.658	0.7232	0.8029	0.0517
H2	SH	180	3.8641	3.9444	4.0248	0.4952	0.5464	0.6095	0.0407
H2	Diff (1-2)		0.3533	0.4841	0.615	0.6016	0.6447	0.6945	0.0666
S2	HK	196	3.892	3.9898	4.0876	0.6316	0.6942	0.7707	0.0496
S2	SH	180	3.7746	3.8556	3.9365	0.4989	0.5505	0.6141	0.041
S2	Diff (1-2)		0.0064	0.1342	0.262	0.5875	0.6295	0.6781	0.065
H3	HK	196	3.774	3.8571	3.9403	0.5373	0.5905	0.6556	0.0422
H3	SH	180	4.2163	4.3389	4.4615	0.7553	0.8334	0.9297	0.0621
H3	Diff (1-2)		-0.627	-0.482	-0.336	0.6692	0.7171	0.7725	0.074
S3	HK	196	3.6421	3.7347	3.8273	0.5979	0.6571	0.7295	0.0469
S3	SH	180	3.959	4.05	4.141	0.5608	0.6188	0.6903	0.0461
S3	Diff (1-2)		-0.445	-0.315	-0.186	0.5964	0.6391	0.6884	0.066
H4	HK	196	4.553	4.6531	4.7531	0.6463	0.7104	0.7886	0.0507
H4	SH	180	4.1806	4.2889	4.3971	0.6671	0.7361	0.8211	0.0549
H4	Diff (1-2)		0.2174	0.3642	0.5109	0.6745	0.7228	0.7786	0.0746
S4	HK	196	3.4366	3.5306	3.6246	0.6071	0.6672	0.7407	0.0477
S4	SH	180	3.6801	3.7889	3.8977	0.6705	0.7398	0.8253	0.0551
S4	Diff (1-2)		-0.401	-0.258	-0.116	0.656	0.7029	0.7572	0.0726
H5	HK	196	4.1376	4.2245	4.3113	0.5609	0.6165	0.6845	0.044
H5	SH	180	3.8957	4	4.1043	0.6426	0.7091	0.791	0.0529
H5	Diff (1-2)		0.09	0.2245	0.359	0.6182	0.6624	0.7136	0.0684
S5	HK	196	3.3475	3.4592	3.5709	0.7216	0.7932	0.8805	0.0567
S5	SH	180	4.1064	4.2056	4.3047	0.6111	0.6743	0.7522	0.0503
S5	Diff (1-2)		-0.896	-0.746	-0.596	0.6893	0.7387	0.7957	0.0763
H6	HK	196	4.335	4.4439	4.5527	0.7029	0.7726	0.8577	0.0552
H6	SH	180	4.3255	4.4333	4.5412	0.6644	0.7331	0.8178	0.0546
H6	Diff (1-2)		-0.142	0.0105	0.1636	0.7036	0.7539	0.8121	0.0778
S6	HK	196	3.571	3.6735	3.7759	0.6616	0.7271	0.8072	0.0519
S6	SH	180	3.5405	3.6611	3.7817	0.743	0.8199	0.9146	0.0611
S6	Diff (1-2)		-0.145	0.0124	0.1693	0.7213	0.7729	0.8326	0.0798
H7	HK	196	4.4657	4.5561	4.6466	0.5842	0.642	0.7128	0.0459
H7	SH	180	4.2597	4.3833	4.507	0.762	0.8408	0.938	0.0627
H7	Diff (1-2)		0.0218	0.1728	0.3238	0.6941	0.7438	0.8013	0.0768
S7	HK	196	3.3101	3.4337	3.5573	0.7983	0.8775	0.9741	0.0627
S7	SH	180	3.5161	3.6333	3.7506	0.7226	0.7973	0.8895	0.0594
S7	Diff (1-2)		-0.37	-0.2	-0.029	0.7839	0.8401	0.9049	0.0867
H8	HK	196	4.3724	4.4796	4.5868	0.6924	0.761	0.8448	0.0544
H8	SH	180	4.5578	4.6667	4.7755	0.6706	0.7399	0.8254	0.0552
H8	Diff (1-2)		-0.34	-0.187	-0.035	0.7008	0.751	0.8089	0.0775
S8	HK	196	3.6431	3.7245	3.8059	0.5258	0.5779	0.6416	0.0413
S8	SH	180	4.1947	4.3	4.4053	0.649	0.7161	0.7989	0.0534
S8	Diff (1-2)		-0.707	-0.576	-0.444	0.6045	0.6477	0.6978	0.0669
H9	HK	196	3.1648	3.3418	3.5189	1.1436	1.257	1.3954	0.0898

Analysis 8-5

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
H9	SH	180	2.7201	2.8222	2.9244	0.6293	0.6944	0.7746	0.0518
H9	Diff (1-2)		0.3112	0.5196	0.7281	0.9583	1.0269	1.1062	0.106
S9	HK	196	3.4694	3.602	3.7347	0.8569	0.9418	1.0455	0.0673
S9	SH	180	3.2234	3.3333	3.4433	0.6774	0.7474	0.8338	0.0557
S9	Diff (1-2)		0.0953	0.2687	0.4421	0.7972	0.8543	0.9203	0.0882
H10	HK	196	3.722	3.8469	3.9719	0.807	0.887	0.9847	0.0634
H10	SH	180	3.8992	4	4.1008	0.6208	0.685	0.7642	0.0511
H10	Diff (1-2)		-0.315	-0.153	0.0087	0.7435	0.7967	0.8582	0.0823
S10	HK	196	4.0445	4.1276	4.2106	0.5365	0.5897	0.6547	0.0421
S10	SH	180	4.3059	4.4111	4.5163	0.6482	0.7153	0.7979	0.0533
S10	Diff (1-2)		-0.416	-0.284	-0.151	0.6092	0.6528	0.7032	0.0674
H11	HK	196	3.1472	3.2347	3.3222	0.565	0.621	0.6894	0.0444
H11	SH	180	3.4544	3.5667	3.6789	0.6915	0.763	0.8511	0.0569
H11	Diff (1-2)		-0.473	-0.332	-0.191	0.6463	0.6926	0.7461	0.0715
S11	HK	196	3.9953	4.102	4.2088	0.6894	0.7577	0.8412	0.0541
S11	SH	180	4.3386	4.4333	4.528	0.5835	0.6438	0.7182	0.048
S11	Diff (1-2)		-0.475	-0.331	-0.188	0.6584	0.7055	0.76	0.0728
H12	HK	196	3.2351	3.3061	3.3772	0.459	0.5045	0.5601	0.036
H12	SH	180	3.3469	3.4278	3.5086	0.4981	0.5496	0.613	0.041
H12	Diff (1-2)		-0.229	-0.122	-0.015	0.4914	0.5266	0.5672	0.0544
S12	HK	196	3.4575	3.5918	3.7262	0.8677	0.9537	1.0587	0.0681
S12	SH	180	3.118	3.2167	3.3153	0.6079	0.6708	0.7483	0.05
S12	Diff (1-2)		0.2066	0.3752	0.5437	0.7749	0.8304	0.8945	0.0857
H13	HK	196	4.1119	4.2143	4.3167	0.6612	0.7268	0.8068	0.0519
H13	SH	180	3.6106	3.6944	3.7783	0.5167	0.5702	0.6361	0.0425
H13	Diff (1-2)		0.3866	0.5198	0.6531	0.6126	0.6565	0.7072	0.0678
S13	HK	196	3.5746	3.7041	3.8336	0.8365	0.9194	1.0207	0.0657
S13	SH	180	3.3203	3.4222	3.5241	0.6278	0.6928	0.7728	0.0516
S13	Diff (1-2)		0.1156	0.2819	0.4481	0.7641	0.8188	0.882	0.0845

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
H1	Pooled	Equal	374	0.46	0.6464
H1	Satterthwaite	Unequal	347	0.47	0.6413
S1	Pooled	Equal	374	-4.39	<.0001
S1	Satterthwaite	Unequal	322	-4.33	<.0001
H2	Pooled	Equal	374	7.27	<.0001
H2	Satterthwaite	Unequal	361	7.36	<.0001
S2	Pooled	Equal	374	2.07	0.0396
S2	Satterthwaite	Unequal	366	2.09	0.0377
H3	Pooled	Equal	374	-6.51	<.0001
H3	Satterthwaite	Unequal	320	-6.42	<.0001
S3	Pooled	Equal	374	-4.78	<.0001
S3	Satterthwaite	Unequal	374	-4.79	<.0001
H4	Pooled	Equal	374	4.88	<.0001
H4	Satterthwaite	Unequal	369	4.87	<.0001

Analysis 8-6

The TTEST Procedure

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
S4	Pooled	Equal	374	-3.56	0.0004
S4	Satterthwaite	Unequal	361	-3.54	0.0004
H5	Pooled	Equal	374	3.28	0.0011
H5	Satterthwaite	Unequal	356	3.26	0.0012
S5	Pooled	Equal	374	-9.79	<.0001
S5	Satterthwaite	Unequal	372	-9.85	<.0001
H6	Pooled	Equal	374	0.14	0.8923
H6	Satterthwaite	Unequal	374	0.14	0.8921
S6	Pooled	Equal	374	0.15	0.8770
S6	Satterthwaite	Unequal	359	0.15	0.8776
H7	Pooled	Equal	374	2.25	0.0250
H7	Satterthwaite	Unequal	334	2.22	0.0267
S7	Pooled	Equal	374	-2.30	0.0219
S7	Satterthwaite	Unequal	374	-2.31	0.0213
H8	Pooled	Equal	374	-2.41	0.0163
H8	Satterthwaite	Unequal	373	-2.42	0.0162
S8	Pooled	Equal	374	-8.61	<.0001
S8	Satterthwaite	Unequal	344	-8.53	<.0001
H9	Pooled	Equal	374	4.90	<.0001
H9	Satterthwaite	Unequal	309	5.01	<.0001
S9	Pooled	Equal	374	3.05	0.0025
S9	Satterthwaite	Unequal	366	3.08	0.0023
H10	Pooled	Equal	374	-1.86	0.0635
H10	Satterthwaite	Unequal	364	-1.88	0.0608
S10	Pooled	Equal	374	-4.21	<.0001
S10	Satterthwaite	Unequal	348	-4.17	<.0001
H11	Pooled	Equal	374	-4.64	<.0001
H11	Satterthwaite	Unequal	346	-4.60	<.0001
S11	Pooled	Equal	374	-4.55	<.0001
S11	Satterthwaite	Unequal	372	-4.58	<.0001
H12	Pooled	Equal	374	-2.24	0.0258
H12	Satterthwaite	Unequal	363	-2.23	0.0264
S12	Pooled	Equal	374	4.38	<.0001
S12	Satterthwaite	Unequal	351	4.44	<.0001
H13	Pooled	Equal	374	7.67	<.0001
H13	Satterthwaite	Unequal	365	7.75	<.0001
S13	Pooled	Equal	374	3.33	0.0009
S13	Satterthwaite	Unequal	361	3.37	0.0008

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
H1	Folded F	195	179	2.13	<.0001
S1	Folded F	179	195	1.95	<.0001
H2	Folded F	195	179	1.75	<.0001
S2	Folded F	195	179	1.59	0.0017
H3	Folded F	179	195	1.99	<.0001
S3	Folded F	195	179	1.13	0.4145

Analysis 8-7

The TTEST Procedure
Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
H4	Folded F	179	195	1.07	0.6266
S4	Folded F	179	195	1.23	0.1579
H5	Folded F	179	195	1.32	0.0560
S5	Folded F	195	179	1.38	0.0276
H6	Folded F	195	179	1.11	0.4762
S6	Folded F	179	195	1.27	0.1008
H7	Folded F	179	195	1.72	0.0002
S7	Folded F	195	179	1.21	0.1931
H8	Folded F	195	179	1.06	0.7037
S8	Folded F	179	195	1.54	0.0034
H9	Folded F	195	179	3.28	<.0001
S9	Folded F	195	179	1.59	0.0018
H10	Folded F	195	179	1.68	0.0005
S10	Folded F	179	195	1.47	0.0084
H11	Folded F	179	195	1.51	0.0050
S11	Folded F	195	179	1.39	0.0271
H12	Folded F	179	195	1.19	0.2420
S12	Folded F	195	179	2.02	<.0001
H13	Folded F	195	179	1.62	0.0010
S13	Folded F	195	179	1.76	<.0001

Analysis 8-8

The MEANS Procedure

Variable	Mean	t Value	Pr > |t|	Minimum	Maximum	Median
D1	-0.3670213	-9.14	<.0001	-2.0000000	2.0000000	0
D2	0.2712766	6.34	<.0001	-3.0000000	3.0000000	0
D3	0.2021277	4.33	<.0001	-3.0000000	3.0000000	0
D4	0.8244681	18.55	<.0001	-3.0000000	4.0000000	1.0000000
D5	0.3005319	5.69	<.0001	-3.0000000	3.0000000	0
D6	0.7712766	20.99	<.0001	-1.0000000	3.0000000	1.0000000
D7	0.9441489	19.18	<.0001	-2.0000000	4.0000000	1.0000000
D8	1.0398936	20.80	<.0001	-2.0000000	4.0000000	1.0000000
D9	-0.4361702	-6.79	<.0001	-3.0000000	4.0000000	-1.0000000
D10	-0.3430851	-8.56	<.0001	-3.0000000	3.0000000	0
D11	-0.8670213	-22.08	<.0001	-3.0000000	1.0000000	-1.0000000
D12	-0.0478723	-1.03	0.3041	-2.0000000	3.0000000	0
D13	0.3962766	10.22	<.0001	-2.0000000	2.0000000	0

Analysis 8-9

The TTEST Procedure
Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
D1	HK	196	-0.341	-0.214	-0.087	0.8216	0.903	1.0025	0.0645
D1	SH	180	-0.618	-0.533	-0.449	0.5194	0.5731	0.6394	0.0427
D1	Diff (1-2)		0.1641	0.319	0.474	0.7121	0.7631	0.822	0.0788
D2	HK	196	0.3079	0.4388	0.5696	0.8452	0.9289	1.0313	0.0664
D2	SH	180	-0.009	0.0889	0.1863	0.6005	0.6626	0.7391	0.0494
D2	Diff (1-2)		0.185	0.3499	0.5148	0.7581	0.8124	0.8751	0.0839
D3	HK	196	-0.002	0.1224	0.2464	0.8008	0.8802	0.9771	0.0629
D3	SH	180	0.1529	0.2889	0.4249	0.8378	0.9245	1.0313	0.0689
D3	Diff (1-2)		-0.349	-0.166	0.0166	0.8414	0.9016	0.9712	0.0931
D4	HK	196	1.0181	1.1224	1.2268	0.6742	0.741	0.8226	0.0529
D4	SH	180	0.3723	0.5	0.6277	0.787	0.8684	0.9688	0.0647
D4	Diff (1-2)		0.4591	0.6224	0.7858	0.7507	0.8045	0.8666	0.0831
D5	HK	196	0.6251	0.7653	0.9055	0.9056	0.9954	1.105	0.0711
D5	SH	180	-0.322	-0.206	-0.09	0.7149	0.7889	0.88	0.0588
D5	Diff (1-2)		0.7877	0.9709	1.1541	0.8422	0.9025	0.9721	0.0932
D6	HK	196	0.6682	0.7704	0.8726	0.6602	0.7256	0.8055	0.0518
D6	SH	180	0.6693	0.7722	0.8752	0.6342	0.6998	0.7807	0.0522
D6	Diff (1-2)		-0.147	-0.002	0.143	0.6657	0.7134	0.7684	0.0736
D7	HK	196	0.9787	1.1224	1.2662	0.9285	1.0205	1.1329	0.0729
D7	SH	180	0.6267	0.75	0.8733	0.7596	0.8382	0.935	0.0625
D7	Diff (1-2)		0.1821	0.3724	0.5628	0.875	0.9376	1.01	0.0968
D8	HK	196	0.8894	1.0459	1.2024	1.0106	1.1108	1.2331	0.0793
D8	SH	180	0.9171	1.0333	1.1496	0.7162	0.7903	0.8816	0.0589
D8	Diff (1-2)		-0.184	0.0126	0.2096	0.9058	0.9707	1.0456	0.1002
D9	HK	196	-0.286	-0.092	0.1023	1.2539	1.3781	1.5299	0.0984
D9	SH	180	-0.952	-0.811	-0.671	0.8663	0.956	1.0664	0.0713
D9	Diff (1-2)		0.4767	0.7193	0.9618	1.115	1.1948	1.2871	0.1233
D10	HK	196	-0.403	-0.281	-0.158	0.7915	0.8699	0.9657	0.0621
D10	SH	180	-0.508	-0.411	-0.314	0.5966	0.6583	0.7344	0.0491
D10	Diff (1-2)		-0.027	0.1305	0.288	0.724	0.7759	0.8358	0.0801
D11	HK	196	-0.976	-0.867	-0.758	0.7034	0.7731	0.8583	0.0552
D11	SH	180	-0.977	-0.867	-0.756	0.6801	0.7504	0.8371	0.0559
D11	Diff (1-2)		-0.155	-68E-5	0.1541	0.7114	0.7623	0.8212	0.0787
D12	HK	196	-0.428	-0.286	-0.143	0.9214	1.0127	1.1243	0.0723
D12	SH	180	0.1116	0.2111	0.3106	0.6133	0.6767	0.7549	0.0504
D12	Diff (1-2)		-0.673	-0.497	-0.321	0.8103	0.8683	0.9353	0.0896
D13	HK	196	0.383	0.5102	0.6374	0.8215	0.9029	1.0024	0.0645
D13	SH	180	0.1963	0.2722	0.3481	0.4676	0.516	0.5756	0.0385
D13	Diff (1-2)		0.0871	0.238	0.3889	0.6936	0.7433	0.8007	0.0767

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
D1	Pooled	Equal	374	4.05	<.0001
D1	Satterthwaite	Unequal	334	4.12	<.0001
D2	Pooled	Equal	374	4.17	<.0001
D2	Satterthwaite	Unequal	353	4.23	<.0001

Analysis 8-10

The TTEST Procedure

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
D3	Pooled	Equal	374	-1.79	0.0746
D3	Satterthwaite	Unequal	367	-1.78	0.0752
D4	Pooled	Equal	374	7.49	<.0001
D4	Satterthwaite	Unequal	353	7.44	<.0001
D5	Pooled	Equal	374	10.42	<.0001
D5	Satterthwaite	Unequal	366	10.52	<.0001
D6	Pooled	Equal	374	-0.02	0.9804
D6	Satterthwaite	Unequal	373	-0.02	0.9803
D7	Pooled	Equal	374	3.85	0.0001
D7	Satterthwaite	Unequal	370	3.88	0.0001
D8	Pooled	Equal	374	0.13	0.9001
D8	Satterthwaite	Unequal	353	0.13	0.8987
D9	Pooled	Equal	374	5.83	<.0001
D9	Satterthwaite	Unequal	349	5.92	<.0001
D10	Pooled	Equal	374	1.63	0.1041
D10	Satterthwaite	Unequal	361	1.65	0.1002
D11	Pooled	Equal	374	-0.01	0.9931
D11	Satterthwaite	Unequal	373	-0.01	0.9931
D12	Pooled	Equal	374	-5.54	<.0001
D12	Satterthwaite	Unequal	343	-5.63	<.0001
D13	Pooled	Equal	374	3.10	0.0021
D13	Satterthwaite	Unequal	315	3.17	0.0017

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
D1	Folded F	195	179	2.48	<.0001
D2	Folded F	195	179	1.97	<.0001
D3	Folded F	179	195	1.10	0.5013
D4	Folded F	179	195	1.37	0.0301
D5	Folded F	195	179	1.59	0.0017
D6	Folded F	195	179	1.08	0.6230
D7	Folded F	195	179	1.48	0.0077
D8	Folded F	195	179	1.98	<.0001
D9	Folded F	195	179	2.08	<.0001
D10	Folded F	195	179	1.75	<.0001
D11	Folded F	195	179	1.06	0.6861
D12	Folded F	195	179	2.24	<.0001
D13	Folded F	195	179	3.06	<.0001

Analysis 8-11

The PRINCOMP Procedure

Observations 376
Variables 13

Simple Statistics

	H1	H2	H3	H4	H5
Mean	3.284574468	4.196808511	4.087765957	4.478723404	4.117021277
StD	0.723971513	0.687868534	0.755607876	0.744454677	0.671021239

Simple Statistics

	H6	H7	H8	H9	H10
Mean	4.438829787	4.473404255	4.569148936	3.093085106	3.920212766
StD	0.752937510	0.747857460	0.755781499	1.057975452	0.799343702

Simple Statistics

	H11	H12	H13
Mean	3.393617021	3.364361702	3.965425532
StD	0.711326799	0.529357968	0.705314175

Correlation Matrix

	H1	H2	H3	H4	H5	H6	H7
H1	1.0000	0.4763	0.2077	0.3106	0.2387	0.1763	0.0953
H2	0.4763	1.0000	0.1309	0.3415	0.1984	0.2550	0.1398
H3	0.2077	0.1309	1.0000	0.1242	-.0098	0.1290	0.1198
H4	0.3106	0.3415	0.1242	1.0000	0.2239	0.4901	0.1666
H5	0.2387	0.1984	-.0098	0.2239	1.0000	0.4153	0.3410
H6	0.1763	0.2550	0.1290	0.4901	0.4153	1.0000	0.4683
H7	0.0953	0.1398	0.1198	0.1666	0.3410	0.4683	1.0000
H8	0.1175	0.1071	0.2158	0.2680	0.2364	0.4784	0.4420
H9	0.0175	0.2496	-.1670	0.0922	0.1987	0.1896	0.2239
H10	0.1361	0.2226	0.2324	0.2526	0.2412	0.3419	0.1883
H11	0.1755	0.0429	0.1191	0.1971	0.0317	0.2642	0.1701
H12	0.0905	0.0003	0.1665	0.0840	0.1124	0.1665	0.1357
H13	-.1896	-.0299	0.0307	0.0316	0.0706	-.0467	0.1272

Correlation Matrix

	H8	H9	H10	H11	H12	H13
H1	0.1175	0.0175	0.1361	0.1755	0.0905	-.1896
H2	0.1071	0.2496	0.2226	0.0429	0.0003	-.0299
H3	0.2158	-.1670	0.2324	0.1191	0.1665	0.0307
H4	0.2680	0.0922	0.2526	0.1971	0.0840	0.0316
H5	0.2364	0.1987	0.2412	0.0317	0.1124	0.0706

Analysis 8-12

The PRINCOMP Procedure

Correlation Matrix

	H8	H9	H10	H11	H12	H13
H6	0.4784	0.1896	0.3419	0.2642	0.1665	-.0467
H7	0.4420	0.2239	0.1883	0.1701	0.1357	0.1272
H8	1.0000	0.0570	0.2431	0.4006	0.0335	-.0380
H9	0.0570	1.0000	0.1728	-.1020	0.1202	-.1601
H10	0.2431	0.1728	1.0000	0.3696	0.2264	0.0140
H11	0.4006	-.1020	0.3696	1.0000	0.1138	-.1110
H12	0.0335	0.1202	0.2264	0.1138	1.0000	0.0553
H13	-.0380	-.1601	0.0140	-.1110	0.0553	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	3.30671940	1.86712195	0.2544	0.2544
2	1.43959745	0.05509355	0.1107	0.3651
3	1.38450390	0.23374779	0.1065	0.4716
4	1.15075611	0.06725364	0.0885	0.5601
5	1.08350247	0.21765571	0.0833	0.6435
6	0.86584675	0.07610594	0.0666	0.7101
7	0.78974082	0.05047616	0.0607	0.7708
8	0.73926466	0.06826557	0.0569	0.8277
9	0.67099909	0.21277969	0.0516	0.8793
10	0.45821940	0.02747609	0.0352	0.9146
11	0.43074331	0.06519077	0.0331	0.9477
12	0.36555254	0.05099845	0.0281	0.9758
13	0.31455409		0.0242	1.0000

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
H1	0.259748	-.281869	-.489311	0.105821	-.080775	-.177752	-.325242
H2	0.274856	-.438921	-.272352	0.198257	-.108135	0.041704	0.326449
H3	0.174049	0.320021	-.358777	0.334378	0.085984	-.500984	0.325087
H4	0.336650	-.103767	-.139122	0.105351	-.220286	0.424009	-.060784
H5	0.300064	-.194085	0.288093	0.141303	-.108440	-.048621	-.460177
H6	0.424747	0.023001	0.179045	-.094838	-.111762	0.049166	-.099008
H7	0.325780	0.098075	0.395399	0.007207	-.130530	-.387371	0.075204
H8	0.346945	0.299331	0.100635	-.284834	-.235807	-.211840	0.103486
H9	0.156093	-.479184	0.333540	-.181523	0.367308	-.056612	0.380173
H10	0.321152	0.139361	-.049543	0.030503	0.378940	0.375708	0.325844
H11	0.253023	0.398958	-.214647	-.373959	0.082782	0.310016	-.077734
H12	0.156134	0.128148	0.064176	0.300902	0.697420	-.070007	-.400465
H13	-.022471	0.229507	0.304803	0.672441	-.239190	0.301347	0.152385

Analysis 8-13

The PRINCOMP Procedure

Eigenvectors

	Prin8	Prin9	Prin10	Prin11	Prin12	Prin13
H1	0.213556	0.239393	-.016784	0.313137	-.304000	0.406063
H2	0.114248	0.276135	0.035359	-.552965	0.166097	-.272779
H3	-.100382	-.338174	0.042158	0.168676	0.328140	0.019014
H4	-.584966	-.104352	0.013990	0.379625	-.035334	-.338832
H5	0.436747	-.430138	0.210964	0.037483	0.268093	-.223361
H6	-.311107	-.205954	-.289488	-.396449	0.146313	0.593053
H7	0.064868	0.341667	-.546357	0.191738	-.114630	-.292835
H8	-.055781	0.086509	0.644226	-.146763	-.372947	-.036475
H9	-.072439	0.092282	0.261521	0.372433	0.209247	0.233493
H10	0.370196	-.332503	-.188449	0.005246	-.446728	-.020457
H11	0.251556	0.353311	-.000327	0.130029	0.526175	-.003156
H12	-.264715	0.258872	0.132032	-.200339	-.058258	-.121740
H13	0.136298	0.280384	0.182522	0.104649	0.044225	0.295098

Analysis 8-14

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
HK1	HK	196	-0.104	0.0526	0.2092	1.0112	1.1114	1.2338	0.0794
HK1	SH	180	-0.184	-0.057	0.0695	0.7812	0.862	0.9616	0.0642
HK1	Diff (1-2)		-0.093	0.1099	0.3129	0.933	0.9998	1.077	0.1032
HK2	HK	196	-0.538	-0.4	-0.261	0.8924	0.9809	1.0889	0.0701
HK2	SH	180	0.3137	0.4352	0.5566	0.7482	0.8256	0.9209	0.0615
HK2	Diff (1-2)		-1.02	-0.835	-0.65	0.8491	0.9099	0.9801	0.0939
HK3	HK	196	0.1192	0.2419	0.3645	0.7921	0.8706	0.9665	0.0622
HK3	SH	180	-0.42	-0.263	-0.107	0.9657	1.0656	1.1887	0.0794
HK3	Diff (1-2)		0.3086	0.5052	0.7019	0.9041	0.9688	1.0436	0.1
HK4	HK	196	0.1419	0.2709	0.3999	0.8333	0.9159	1.0168	0.0654
HK4	SH	180	-0.443	-0.295	-0.147	0.9123	1.0066	1.1229	0.075
HK4	Diff (1-2)		0.3709	0.5659	0.7608	0.8962	0.9604	1.0345	0.0991
HK5	HK	196	-0.401	-0.239	-0.077	1.047	1.1508	1.2775	0.0822
HK5	SH	180	0.1539	0.2602	0.3664	0.6546	0.7223	0.8058	0.0538
HK5	Diff (1-2)		-0.696	-0.499	-0.302	0.9048	0.9696	1.0445	0.1001

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
HK1	Pooled	Equal	374	1.06	0.2877
HK1	Satterthwaite	Unequal	364	1.08	0.2826
HK2	Pooled	Equal	374	-8.89	<.0001
HK2	Satterthwaite	Unequal	371	-8.95	<.0001
HK3	Pooled	Equal	374	5.05	<.0001
HK3	Satterthwaite	Unequal	346	5.01	<.0001
HK4	Pooled	Equal	374	5.71	<.0001
HK4	Satterthwaite	Unequal	362	5.68	<.0001
HK5	Pooled	Equal	374	-4.99	<.0001
HK5	Satterthwaite	Unequal	332	-5.08	<.0001

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
HK1	Folded F	195	179	1.66	0.0006
HK2	Folded F	195	179	1.41	0.0194
HK3	Folded F	179	195	1.50	0.0058
HK4	Folded F	179	195	1.21	0.1963
HK5	Folded F	195	179	2.54	<.0001

Analysis 8-15

The PRINCOMP Procedure

Observations 376
Variables 13

Simple Statistics

	S1	S2	S3	S4	S5
Mean	3.651595745	3.925531915	3.885638298	3.654255319	3.816489362
StD	0.643654240	0.632276087	0.657434299	0.713775299	0.826781335

Simple Statistics

	S6	S7	S8	S9	S10
Mean	3.667553191	3.529255319	4.000000000	3.473404255	4.263297872
StD	0.771913897	0.844871890	0.708048963	0.863688281	0.667200141

Simple Statistics

	S11	S12	S13
Mean	4.260638298	3.412234043	3.569148936
StD	0.723800059	0.850260703	0.829782506

Correlation Matrix

	S1	S2	S3	S4	S5	S6	S7
S1	1.0000	-.0574	-.0566	-.0481	0.1201	0.0453	0.0605
S2	-.0574	1.0000	0.2553	0.2914	0.0758	0.1185	-.0708
S3	-.0566	0.2553	1.0000	0.1883	0.2900	0.0983	0.0420
S4	-.0481	0.2914	0.1883	1.0000	0.3441	0.4394	0.0610
S5	0.1201	0.0758	0.2900	0.3441	1.0000	0.3930	0.2310
S6	0.0453	0.1185	0.0983	0.4394	0.3930	1.0000	0.3032
S7	0.0605	-.0708	0.0420	0.0610	0.2310	0.3032	1.0000
S8	0.1404	-.1608	-.0859	0.1741	0.2870	0.1952	0.3834
S9	-.0287	0.1526	-.0359	0.0196	-.0610	0.2327	0.1527
S10	0.3694	-.0103	0.0020	0.1469	0.2135	0.2584	0.2252
S11	0.1496	0.0017	-.0325	0.1491	0.2316	0.3989	0.1445
S12	-.0438	0.0523	-.2351	0.0421	-.0476	0.1850	0.1187
S13	-.3118	0.1013	0.1001	0.0765	0.0710	0.2046	0.2843

Correlation Matrix

	S8	S9	S10	S11	S12	S13
S1	0.1404	-.0287	0.3694	0.1496	-.0438	-.3118
S2	-.1608	0.1526	-.0103	0.0017	0.0523	0.1013
S3	-.0859	-.0359	0.0020	-.0325	-.2351	0.1001
S4	0.1741	0.0196	0.1469	0.1491	0.0421	0.0765
S5	0.2870	-.0610	0.2135	0.2316	-.0476	0.0710

Analysis 8-16

The PRINCOMP Procedure

Correlation Matrix

	S8	S9	S10	S11	S12	S13
S6	0.1952	0.2327	0.2584	0.3989	0.1850	0.2046
S7	0.3834	0.1527	0.2252	0.1445	0.1187	0.2843
S8	1.0000	-.0044	0.3330	0.2550	0.2613	-.0953
S9	-.0044	1.0000	0.1302	0.1945	0.5361	0.2668
S10	0.3330	0.1302	1.0000	0.3434	0.2453	0.2199
S11	0.2550	0.1945	0.3434	1.0000	0.2236	0.0232
S12	0.2613	0.5361	0.2453	0.2236	1.0000	0.1504
S13	-.0953	0.2668	0.2199	0.0232	0.1504	1.0000

Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	2.90002027	1.11477637	0.2231	0.2231
2	1.78524390	0.07130257	0.1373	0.3604
3	1.71394133	0.51319023	0.1318	0.4922
4	1.20075109	0.20297859	0.0924	0.5846
5	0.99777250	0.17307215	0.0768	0.6614
6	0.82470035	0.07005317	0.0634	0.7248
7	0.75464717	0.07191564	0.0580	0.7829
8	0.68273153	0.07709486	0.0525	0.8354
9	0.60563667	0.08049155	0.0466	0.8820
10	0.52514513	0.13469882	0.0404	0.9224
11	0.39044631	0.06076392	0.0300	0.9524
12	0.32968239	0.04040103	0.0254	0.9777
13	0.28928137		0.0223	1.0000

Eigenvectors

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7
S1	0.109376	-.207636	-.438401	0.360352	0.469335	0.106666	0.024071
S2	0.084610	0.387561	0.239413	0.436134	0.114153	0.372732	-.132155
S3	0.067398	0.518778	-.044931	-.043948	0.339689	0.173851	0.407121
S4	0.283546	0.377516	-.036608	0.185117	-.386040	0.066592	-.403398
S5	0.321843	0.300695	-.278999	-.110610	-.059332	-.008873	0.181490
S6	0.423572	0.159521	0.027213	0.039034	-.181993	-.330370	0.097705
S7	0.314820	-.073288	-.017832	-.529232	0.133668	0.276090	0.193307
S8	0.316068	-.224283	-.281603	-.202158	-.312246	0.442123	-.039569
S9	0.234469	-.184208	0.488644	0.208623	0.128195	0.109963	0.378691
S10	0.364200	-.176458	-.139550	0.072766	0.442978	-.055081	-.484207
S11	0.347452	-.126165	-.082696	0.222019	-.077586	-.546990	0.274232
S12	0.263205	-.357729	0.362194	0.192395	-.176509	0.263639	0.019928
S13	0.190562	0.120573	0.438928	-.417007	0.316912	-.224241	-.344379

Analysis 8-17

The PRINCOMP Procedure

Eigenvectors

	Prin8	Prin9	Prin10	Prin11	Prin12	Prin13
S1	-.356492	-.168574	-.007388	0.102347	0.090570	0.465196
S2	-.119827	0.529843	-.318492	-.127649	-.113130	-.007696
S3	0.416917	-.085117	0.427623	-.146778	0.117194	0.108683
S4	-.136619	-.181723	0.364277	0.443924	0.208745	0.015951
S5	0.137706	-.342518	-.708374	0.144429	0.043399	-.136268
S6	-.401374	-.143115	0.129161	-.626495	-.219809	0.044565
S7	-.447363	0.314672	0.084669	0.105043	0.331907	-.236929
S8	0.278798	0.162780	0.083520	-.025459	-.479545	0.305419
S9	-.098234	-.272819	0.090609	0.388323	-.422173	-.188542
S10	0.277751	-.030611	0.109434	-.133848	-.075448	-.513874
S11	0.246561	0.522464	0.022292	0.251914	0.139902	0.097554
S12	0.238374	-.196450	-.099589	-.287248	0.568527	0.149756
S13	0.061108	-.018339	-.140456	0.122061	-.068166	0.519556

Analysis 8-18

The TTEST Procedure

Statistics

Variable	Sample	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
SH1	HK	196	-0.369	-0.236	-0.103	0.8594	0.9445	1.0486	0.0675
SH1	SH	180	0.1105	0.2573	0.404	0.9042	0.9977	1.113	0.0744
SH1	Diff (1-2)		-0.69	-0.494	-0.297	0.9055	0.9703	1.0453	0.1002
SH2	HK	196	-0.288	-0.115	0.0575	1.1164	1.227	1.3621	0.0876
SH2	SH	180	0.0298	0.1256	0.2215	0.5904	0.6515	0.7268	0.0486
SH2	Diff (1-2)		-0.443	-0.241	-0.039	0.9276	0.994	1.0708	0.1026
SH3	HK	196	0.3639	0.4838	0.6036	0.774	0.8508	0.9445	0.0608
SH3	SH	180	-0.656	-0.527	-0.398	0.7958	0.8782	0.9796	0.0655
SH3	Diff (1-2)		0.8352	1.0106	1.186	0.8062	0.864	0.9307	0.0892
SH4	HK	196	-0.086	0.0667	0.2193	0.9855	1.0831	1.2024	0.0774
SH4	SH	180	-0.205	-0.073	0.0594	0.814	0.8982	1.002	0.0669
SH4	Diff (1-2)		-0.063	0.1394	0.3422	0.9322	0.9989	1.076	0.1031

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
SH1	Pooled	Equal	374	-4.93	<.0001
SH1	Satterthwaite	Unequal	367	-4.91	<.0001
SH2	Pooled	Equal	374	-2.35	0.0194
SH2	Satterthwaite	Unequal	302	-2.41	0.0168
SH3	Pooled	Equal	374	11.33	<.0001
SH3	Satterthwaite	Unequal	369	11.32	<.0001
SH4	Pooled	Equal	374	1.35	0.1772
SH4	Satterthwaite	Unequal	370	1.36	0.1738

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
SH1	Folded F	179	195	1.12	0.4530
SH2	Folded F	195	179	3.55	<.0001
SH3	Folded F	179	195	1.07	0.6637
SH4	Folded F	195	179	1.45	0.0111

Analysis 8-19

The CORR Procedure

9 Variables: HK1 HK2 HK3 HK4 HK5 SH1 SH2 SH3 SH4

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	376	0	1.00000	0	-3.12673	1.67669
HK2	376	0	1.00000	0	-3.07121	2.28611
HK3	376	0	1.00000	0	-3.40213	2.89650
HK4	376	0	1.00000	0	-3.33797	2.19199
HK5	376	0	1.00000	0	-2.39904	2.89982
SH1	376	0	1.00000	0	-2.34634	2.41239
SH2	376	0	1.00000	0	-3.22226	2.22888
SH3	376	0	1.00000	0	-3.10151	2.40208
SH4	376	0	1.00000	0	-3.31901	2.96649

Pearson Correlation Coefficients, N = 376

Prob > |r| under H0: Rho=0

	HK1	HK2	HK3	HK4	HK5	SH1	SH2	SH3	SH4
HK1	1.00000	0.00000	0.00000	0.00000	0.00000	0.62245	-0.25004	-0.12816	0.14473
		1.0000	1.0000	1.0000	1.0000	<.0001	<.0001	0.0129	0.0049
HK2	0.00000	1.00000	0.00000	0.00000	0.00000	0.11785	0.21259	-0.26716	-0.35873
	1.0000		1.0000	1.0000	1.0000	0.0223	<.0001	<.0001	<.0001
HK3	0.00000	0.00000	1.00000	0.00000	0.00000	0.21536	-0.08169	0.40659	-0.15691
	1.0000	1.0000		1.0000	1.0000	<.0001	0.1138	<.0001	0.0023
HK4	0.00000	0.00000	0.00000	1.00000	0.00000	-0.13601	0.12386	0.09994	-0.20121
	1.0000	1.0000	1.0000		1.0000	0.0083	0.0163	0.0528	<.0001
HK5	0.00000	0.00000	0.00000	0.00000	1.00000	0.30438	-0.01032	-0.03425	-0.06546
	1.0000	1.0000	1.0000	1.0000		<.0001	0.8419	0.5080	0.2053
SH1	0.62245	0.11785	0.21536	-0.13601	0.30438	1.00000	0.00000	0.00000	0.00000
	<.0001	0.0223	<.0001	0.0083	<.0001		1.0000	1.0000	1.0000
SH2	-0.25004	0.21259	-0.08169	0.12386	-0.01032	0.00000	1.00000	0.00000	0.00000
	<.0001	<.0001	0.1138	0.0163	0.8419	1.0000		1.0000	1.0000
SH3	-0.12816	-0.26716	0.40659	0.09994	-0.03425	0.00000	0.00000	1.00000	0.00000
	0.0129	<.0001	<.0001	0.0528	0.5080	1.0000	1.0000		1.0000
SH4	0.14473	-0.35873	-0.15691	-0.20121	-0.06546	0.00000	0.00000	0.00000	1.00000
	0.0049	<.0001	0.0023	<.0001	0.2053	1.0000	1.0000	1.0000	

Analysis 8-20

---------- Sample=HK ----------

The CORR Procedure

9 Variables: HK1 HK2 HK3 HK4 HK5 SH1 SH2 SH3 SH4

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	196	0.05261	1.11141	10.31227	-3.12673	1.67669
HK2	196	-0.39965	0.98087	-78.33105	-3.07121	2.24325
HK3	196	0.24187	0.87057	47.40707	-1.99894	2.89650
HK4	196	0.27089	0.91587	53.09394	-2.42287	2.03570
HK5	196	-0.23893	1.15077	-46.83018	-2.39904	2.75964
SH1	196	-0.23625	0.94451	-46.30509	-2.34634	2.41239
SH2	196	-0.11538	1.22699	-22.61385	-3.22226	2.22888
SH3	196	0.48379	0.85075	94.82300	-1.37978	2.40208
SH4	196	0.06674	1.08313	13.08129	-3.31901	2.96649

Pearson Correlation Coefficients, N = 196

Prob > |r| under H0: Rho=0

	HK1	HK2	HK3	HK4	HK5	SH1	SH2	SH3	SH4
HK1	1.00000	-0.29503	-0.08885	-0.15392	0.04843	0.65804	-0.35062	-0.00548	0.26012
		<.0001	0.2156	0.0312	0.5003	<.0001	<.0001	0.9393	0.0002
HK2	-0.29503	1.00000	0.27957	0.23702	-0.16843	-0.28201	0.26811	-0.06681	-0.45652
	<.0001		<.0001	0.0008	0.0183	<.0001	0.0001	0.3522	<.0001
HK3	-0.08885	0.27957	1.00000	-0.33835	-0.00246	0.26729	-0.01451	0.37622	0.16775
	0.2156	<.0001		<.0001	0.9727	0.0002	0.8400	<.0001	0.0188
HK4	-0.15392	0.23702	-0.33835	1.00000	-0.05175	-0.20212	0.24325	-0.12633	-0.45973
	0.0312	0.0008	<.0001		0.4713	0.0045	0.0006	0.0777	<.0001
HK5	0.04843	-0.16843	-0.00246	-0.05175	1.00000	0.37329	-0.03669	0.02661	-0.08193
	0.5003	0.0183	0.9727	0.4713		<.0001	0.6096	0.7112	0.2536
SH1	0.65804	-0.28201	0.26729	-0.20212	0.37329	1.00000	-0.12803	0.34682	0.23164
	<.0001	<.0001	0.0002	0.0045	<.0001		0.0737	<.0001	0.0011
SH2	-0.35062	0.26811	-0.01451	0.24325	-0.03669	-0.12803	1.00000	0.11835	0.00682
	<.0001	0.0001	0.8400	0.0006	0.6096	0.0737		0.0985	0.9244
SH3	-0.00548	-0.06681	0.37622	-0.12633	0.02661	0.34682	0.11835	1.00000	0.11796
	0.9393	0.3522	<.0001	0.0777	0.7112	<.0001	0.0985		0.0996
SH4	0.26012	-0.45652	0.16775	-0.45973	-0.08193	0.23164	0.00682	0.11796	1.00000
	0.0002	<.0001	0.0188	<.0001	0.2536	0.0011	0.9244	0.0996	

Analysis 8-21

---------- Sample=SH ----------

The CORR Procedure

9 Variables: HK1 HK2 HK3 HK4 HK5 SH1 SH2 SH3 SH4

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
HK1	180	-0.05729	0.86198	-10.31227	-2.98079	1.09739
HK2	180	0.43517	0.82556	78.33105	-2.39449	2.28611
HK3	180	-0.26337	1.06561	-47.40707	-3.40213	2.44094
HK4	180	-0.29497	1.00664	-53.09394	-3.33797	2.19199
HK5	180	0.26017	0.72233	46.83018	-1.62794	2.89982
SH1	180	0.25725	0.99773	46.30509	-1.88003	2.08031
SH2	180	0.12563	0.65151	22.61385	-2.51095	2.04094
SH3	180	-0.52679	0.87816	-94.82300	-3.10151	0.91438
SH4	180	-0.07267	0.89820	-13.08129	-2.91455	2.27015

Pearson Correlation Coefficients, N = 180

Prob > |r| under H0: Rho=0

	HK1	HK2	HK3	HK4	HK5	SH1	SH2	SH3	SH4
HK1	1.00000	0.55994	0.07027	0.15914	-0.06219	0.67431	0.01944	-0.42417	-0.05935
		<.0001	0.3486	0.0329	0.4069	<.0001	0.7956	<.0001	0.4287
HK2	0.55994	1.00000	-0.04430	0.01884	-0.01895	0.38311	-0.02156	-0.07825	-0.21868
	<.0001		0.5549	0.8018	0.8006	<.0001	0.7739	0.2964	0.0032
HK3	0.07027	-0.04430	1.00000	0.13426	0.17521	0.32209	-0.13025	0.29985	-0.56205
	0.3486	0.5549		0.0723	0.0186	<.0001	0.0814	<.0001	<.0001
HK4	0.15914	0.01884	0.13426	1.00000	0.28532	0.05168	0.05059	0.01907	0.03753
	0.0329	0.8018	0.0723		0.0001	0.4908	0.5000	0.7995	0.6169
HK5	-0.06219	-0.01895	0.17521	0.28532	1.00000	0.09235	-0.06000	0.25896	0.01632
	0.4069	0.8006	0.0186	0.0001		0.2176	0.4237	0.0004	0.8279
SH1	0.67431	0.38311	0.32209	0.05168	0.09235	1.00000	0.15274	-0.04813	-0.24782
	<.0001	<.0001	<.0001	0.4908	0.2176		0.0407	0.5211	0.0008
SH2	0.01944	-0.02156	-0.13025	0.05059	-0.06000	0.15274	1.00000	-0.01207	0.01322
	0.7956	0.7739	0.0814	0.5000	0.4237	0.0407		0.8722	0.8602
SH3	-0.42417	-0.07825	0.29985	0.01907	0.25896	-0.04813	-0.01207	1.00000	-0.24375
	<.0001	0.2964	<.0001	0.7995	0.0004	0.5211	0.8722		0.0010
SH4	-0.05935	-0.21868	-0.56205	0.03753	0.01632	-0.24782	0.01322	-0.24375	1.00000
	0.4287	0.0032	<.0001	0.6169	0.8279	0.0008	0.8602	0.0010	