



香港統計學會

Hong Kong Statistical Society

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Editor's Foreword

This is the first Bulletin of this year and is a fruitful one. We would like to express our special thanks to our contributors, Raymond Wong, James Cheng and the HKSS Examination Board for their articles. Nevertheless, I would urge you members to contribute some articles for this Bulletin, or, you may inform us some interesting news in statistics.

In this issue, as usual, we have our President's Forum. Actuarial science applies mathematical and statistical methods to finance and insurance fields and actuarial science related programmes attract a lot of students in Hong Kong. For those who are interested or may consider their career related to actuarial science, Raymond Wong's paper is highly recommended. James Cheng introduce the work of a major global statistical project, International Comparison Program (ICP), coordinated by the World Bank in 2005 that aims at measuring the Purchasing Power Parities for countries around the world and comparing their

PPP-based Gross Domestic Product estimates. Our Society has conducted five rounds of the HKSS Professional Statistical Examination since October 2001. Before the new modular form of syllabus for Higher Certificate examination would also be introduced by phase in 2007 and 2008, the HKSS Examination Board gives us a report and summaries the performance of our candidates sitting for this examination.

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President's Forum

Professor Tony W.K. FUNG

This year the Society has successfully held the 20th Anniversary of the Statistical Project Competition (SPC) for Secondary School Students. A total of 241 statistical projects from 1163 students of 64 secondary schools were received. The prize presentation ceremony was held in April, 2006. We are gratefully to Wing Lung Bank Limited in sponsoring the event.

The 2006/2007 SPC is now under-going. I am most grateful to Mr. Frank Fong for being the Chairman of this event. Frank is so kind that he has been the Chairman of the SPC for several terms.

I am glad to let you know that Wing Lung Bank Limited will continue to sponsor the 2006/07 SPC. Some of you may know that the Census and Statistics Department (C&SD) is going to celebrate its 40th Anniversary next year. Since C&SD has been playing a very important role in the SPC event. In the 2006/07 session there will be a thematic prize sponsored by C&SD, as one of the events of its 40th Anniversary programme. The thematic topics are:

- Structural Changes of the Hong Kong Society in the Past Decades

- Hong Kong as an International Financial Centre – Past, Present and Future

The latter topic is sponsored by Wing Lung Bank Limited.

Next year is also the 30th Anniversary of our Society. We are planning some activities to celebrate the event and will let you know the details when they are available.

What is actuarial science?

*Raymond W L Wong
The University of Hong Kong*

Introduction

Actuarial Science become more and more popular and hot area around the world and in Hong Kong, but few people fully understand what kind of work an actuary is doing and how to be qualified as an actuary.

Generally speaking, actuarial science applies mathematical and statistical methods to finance and insurance fields, particularly to the assessment of risk. It includes a number of interrelating disciplines, including probability and statistics, finance, and economics.

Historical Development

Historically, actuarial science used deterministic models in the construction of tables and premiums. It has gone through revolutionary changes during the last 30 years due to the explosion of high speed computers and the synergy of stochastic actuarial models with modern financial theory.

The seventeenth century was a period of extraordinary advances in mathematics. At the same time there was a rapidly growing need to place the valuation of personal risk on

a more scientific basis. Compound interest was studied and probability theory emerged as a well understood mathematical discipline. Another important advance came in 1662 from John Graunt, who showed that there were predictable patterns of longevity and death in a defined group of people (i.e. cohort group), despite the uncertainty about the future longevity or mortality of any one individual person. This study became the basis for the original life table. It was now possible to set up an insurance scheme to provide life insurance or pensions for a group of people, and to calculate with some degree of accuracy how much each person in the group should contribute to a common fund. The first person to demonstrate publicly how this could be done was Edmond Halley. In addition to constructing his own life table, Halley demonstrated a method of using his life table to calculate the premium someone of a given age should pay to purchase a life-annuity (Halley 1693).

Pioneering actuarial work on the level premium system was developed by James Dodson in 1762. His work also led to the formation of the first life insurance company to use premium rates which were calculated

scientifically for long-term life policies. Later Edward Rowe Mores took over the leadership of the company and specified that the chief official of an insurance company should be called an 'actuary' (Ogborn, 1956). Other companies which did not originally use such mathematical and scientific methods most often failed or were forced to adopt the methods pioneered by them (Bühlmann 1997).

In the eighteenth and nineteenth centuries, computational complexity was limited to manual calculations. The actual calculations required to compute fair insurance premiums are rather complex. The actuaries had developed methods to construct easily-used tables, using sophisticated approximations called commutation functions, to facilitate manual calculations of premiums (Slud 2006). However, calculations remained cumbersome and actuarial shortcuts were commonplace. The 1920 revision to workers compensation rates took over two months of around-the-clock work by day and night teams of actuaries (Michelbacher 1920). In the 1930s, rigorous mathematical foundations for stochastic processes were developed (Bühlmann 1997). Actuaries could now begin to forecast losses using models of random events instead of deterministic methods. Computers further revolutionized the actuarial profession, the modeling and forecasting ability of the actuary has grown exponentially (MacGinnitie 1980).

Another modern development is the convergence of modern financial theory with actuarial science (Bühlmann 1997). In the early twentieth century, actuaries were developing many techniques that can be found in modern financial theory, but these developments did not achieve much recognition, until late 1980s, there was a distinct effort for actuaries to combine financial theory and stochastic methods into their established models (D'arcy 1989). Today, the profession, both in practice and in the educational syllabi of many actuarial organizations, combines tables, loss models, stochastic methods and financial theory (Feldblum 2001).

Actuaries' work

Actuaries are essential employees of most companies because they determine future risk, make price decisions and formulate investment strategies. Using their broad knowledge, actuaries help design and price insurance policies, pension plans, and other financial strategies in a manner which will help ensure that the plans are maintained on a sound financial basis. Technically they assemble and analyze data to estimate probability and possible cost of the occurrence of an event, such as death, sickness, injury, disability or property loss. They always address financial questions, such as the level of pension contributions required to produce a certain income level or how a company should invest resources to maximize

return on investment in light of potential risk. Moreover, actuaries may help determine company policy and sometimes explain complex technical matters to company executives, government officials, shareholders, policyholders or the public in general (Bureau of Labor Statistics 2005).

Being skilled statisticians, actuaries are able to analyze data of past events, assess the level of the present risks, and forecast what could happen and its consequence in the future, which in turn make them able to estimate the financial implications of business decisions. There are various areas of their work, but the main focus are in four areas: (1) life assurance providing life assurance, savings, pensions and other financial services to clients for safeguarding their long-term financial security; (2) actuarial consultancy involving consulting on all aspects of employee benefits, pension schemes as well as investment strategy; (3) general insurance business in fire accident, motor vehicle, workers' compensation and etc.; and (4) financial services in health insurance and risk management.

Job rankings and rewards

CareerJournal.com editors conferred with Mr. Les Krantz a nonfiction publisher and researcher. He is interested in researching the best and worst jobs using data from such sources as the U.S. Bureau of Labor Statistics and the U.S. Census Bureau, as well as

studies from trade associations and industry groups. Mr. Krantz uses six core factors to judge a job: income, stress, physical demands, outlook, security and work environment. He compiled statistics on 250 occupations from accountant to zoologist and published his results in a Wall Street Journal survey on the best jobs in the United States every few years. "Actuary" was listed as the second best job based on these factors in 2002 recently, while in previous editions of the list, actuary had been the top rated job in 1988 and 1995 (Lee 2002) and it has never been rated lower than fourth as in the following table.

Edition	Year	"Actuary" ranking
1	1988	1
2	1992	2
3	1995	1
4	1999	2
5	2000	4
6	2002	2

There is also a significant financial incentive to be an actuary. An actuarial student is likely to start on monthly salary around HK\$12,000 to HK\$15,000. It will excess HK\$40,000 for a newly qualified actuary and HK\$100,000 for a senior actuary. Both the salary level and advancement for actuaries depend on their experience and the level of actuarial examinations passed (ASHK, 2006).

Training and qualification conferment

Actuaries need a strong background in mathematics. Applicants for beginning actuarial jobs usually have a bachelor degree in mathematics, actuarial science, statistics or a business-related discipline such as economics, finance or accounting. In addition to knowledge of mathematics, computer skills are becoming increasingly important since actuaries should be able to develop and use spreadsheets and databases, as well as standard statistical analysis software. Knowledge of computer programming languages is useful. Besides, good communication and interpersonal skills are also important especially for prospective consulting actuaries.

Two major professional societies sponsor programs leading to full professional status in their specialty. The Society of Actuaries (SOA) administers a series of actuarial examinations in the life insurance, health benefits systems, retirement systems, and finance and investment fields. The Casualty Actuarial Society (CAS) gives a series of examinations in the property and casualty field, which includes fire, accident, medical malpractice, worker's compensation and personal injury liability.

The Society of Actuaries' membership requirements include passing six examinations for Associateship, and an additional two examinations, together with

the completion of a professional paper, for Fellowship (SOA 2006). The Casualty Actuary Society requires the successful completion of seven examinations for Associateship and two additional examinations for Fellowship. In addition to these requirements, casualty actuarial candidates must also complete professionalism education and be recommended for membership by existing members (CAS 2006). Continuing education is required after certification for all actuaries.

Becoming a fully credentialed actuary requires passing a rigorous series of examinations, it usually takes several years. In Hong Kong, most study takes place both during employment and in a university setting. During employment, self-study and then sitting the professional actuarial examinations with their own paces is the core mode of credential conferment. In education setting, there are two universities providing full time undergraduate degree programs in actuarial science. They are the University of Hong Kong and The Chinese University of Hong Kong. They offer students various actuarial science courses, which help them to prepare for most of the actuarial examinations held by the Society of Actuaries (SOA) or the Casualty Actuarial Society (CAS). Nevertheless, the former university has 13-year course development experience since the launch of the program in 1994, which is also the first programme of its kind in Hong Kong. In light of its success in terms of

student quality and job prospects, some other tertiary institutes in Hong Kong begin to run similar courses or programmes in the last few years in full time or part time mode. However, admission into the Bachelor Science programme in Actuarial Science is not easy. For example, the average admission grade of the programme in the University of Hong Kong was rated at the top among all tertiary study programmes in Hong Kong since 1996. The average admission score of the Hong Kong Advanced Level Examination for JUPAS students was 4.9 out of 5 last year, the detailed breakdown of the admission grades was

	AL1	AL2	AL3
Top	A	A	A
Median	A	A	A
Lowest	A	A	B

The programme has also exemption arrangements with the Institute of Actuaries and is arranging for accreditation with the Australian Institute of Actuaries. In addition, it has obtained Validation by Education Experience (VEE) with the Casualty Actuarial Society and the Society of Actuaries, and it can offer both exchange opportunities to students to study at world renowned universities and internship opportunities with major companies in Hong Kong. This may be the reason why it attracts so many form six students through the Early Admission Scheme (the admitted students

have 7As to 10As in the HKCEE last year), non-JUPAS students and assorted scholarship holders from top universities in mainland China.

Lecturers in the programme have many years of teaching and research experience in actuarial science, and have strong academic qualifications with professional qualifications such as Fellow or Associate of the Society of Actuaries and the Actuarial Society of Hong Kong. Regarding research, there are three top journals namely ASTIN Bulletin, Scandinavian Actuarial Journal and Insurance, Mathematics & Economics. Actuarial colleagues in the University of Hong Kong perform well. For example, they have published over twenty to thirty articles in these top journals.

Many graduates nowadays are employing in actuarial field as well as insurance industry as middle managers and professionals. In fact, graduates from universities may work for insurance companies, consulting firms, government bodies, Hospital Authority, accounting firms, banks and investment firms. Many prospective actuaries begin taking the examinations in university with the help of courses and self-study guides. Those who pass some actuarial examination papers have better opportunities for employment at higher starting salaries than those who do not.

Career Prospects

Asia is facing rapid change and development in many financial economies, demand for fully qualified or partially qualified actuaries is extremely high. Nevertheless nowadays less than 1,000 actuaries currently work on Asia. In addition to the soaring demand for actuaries on all main four areas of work in Asia, there is also an increasing demand for actuaries in governments, especially in developing financial services regulation and social security systems (ASHK, 2006).

Employment of actuaries is expected to grow faster than average for all occupations through 2014. Because the stringent qualifying examination system restricts the number of candidates throughout the world, employment opportunities should remain good for those who qualify. As a result, actuaries are in high demand, and they are highly paid for the services they render.

Employment growth in the insurance industry is expected to continue at a stable pace, which ensures the creation of new actuary jobs in this key industry over a long period of time. Actuaries will continue to be needed to develop, price, evaluate a variety of insurance products and calculate the costs of new risks. It is especially true in Mainland China, since she had joined the World Trade Organization, it is required to open her insurance industry to the world. This means a

huge amount of qualified actuaries are vital to fit the needs. It is expected that there are shortage of 5000 actuarial professions in the coming five years in China. Also, new actuarial positions have been created in property-casualty insurance to analyze evolving risks since 911 terrorism event in US.

Some new employment opportunities for actuaries should also become available in the health care field as health care issues and Medicare (i.e. medical insurance plan) continue to receive growing attention. Increased regulation of health care companies and the desire to control health care costs will continue to provide many job opportunities for actuaries.

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International Comparison Program 2005

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Introduction

Established in 1968, the International Comparison Program (ICP) is a major global statistical project that aims at measuring the Purchasing Power Parities (PPPs) for countries around the world and comparing their PPP-based Gross Domestic Product (GDP) estimates. PPPs are rates of currency conversion which equalize the purchasing power of different currencies by eliminating the differences in price levels amongst countries. The PPP between two countries, A and B, is the rate at which the currency of country A needs to be converted into that of country B so that a given amount of country A's currency will purchase a basket of goods and services in country B in exactly the same quantities as it does in country A. Through compiling PPPs, the price level of the countries/economies under study can also be compared.

The current round of ICP, with 2005 as the reference year, is coordinated by the World Bank. Hong Kong is taking part in ICP 2005 amongst about 150 countries/economies around the world. Hong Kong has also participated in previous

rounds of ICP with reference years of 1980, 1985 and 1993.

Importance of ICP

There are considerable limitations in using market exchange rates (X-rates) to convert GDP of different countries for comparison. Owing to speculations and government interventions, X-rates may be very volatile. Thus, if we convert different currencies using X-rates, a country may appear to have suddenly become "richer" or "poorer" even though there has been little change in the volume of goods and services produced. Moreover, X-rates may not be purely reflecting differences in price levels across countries as they may also be affected by other elements like interest rates and financial flows.

GDP converted by X-rates and by PPPs could give quite different pictures. For instance, according to the results of ICP 1993, the per capita GDP based on X-rate conversion for Japan was US\$34,330, much higher than that for Hong Kong at US\$19,590. However, if PPP was used as the conversion factor, the per capita GDP for Japan and

Hong Kong would become very close, being US\$20,830 and US\$20,420 respectively.

PPPs enable the GDP of different countries and other key economic aggregates to be valued at comparable price levels, hence making it possible to make comparisons of the underlying volumes, free of price and exchange rate distortions. Volume comparisons of GDP and its components are useful for comparing the standard of living and productivity level across economies, assessing the incidence of poverty, and monitoring progress of policies targeted to poverty alleviation. With the availability of PPP data, we can also carry out inter-country comparisons on variables other than the GDP, such as wages and expenditure, without being distorted by the fluctuations in X-rates.

Methodological framework

ICP 2005 is being conducted on a regional basis within the general framework of the global program. All participating countries/economies of ICP 2005 are grouped in 6 regions, namely Asia and the Pacific; Africa; Commonwealth of Independent States; Eurostat-OECD; Latin America; and Western Asia. Comparison will first be conducted within each region. A separate comparison, known as the Ring Comparison, which involves a few countries/economies selected from each of the 6 regions, will then serve to link up the regional results for deriving globally consistent results. Apart from

taking part in the regional comparison of Asia and the Pacific, Hong Kong is also participating in the Ring Comparison.

For comparing GDP across countries, 155 GDP aggregates called Basic Headings (BHs) are formed, covering the components of private consumption expenditure (C), government consumption expenditure (G), gross domestic capital formation (I) and net exports (X – M). Prices are to be collected for some specified items, known as “leaf products”, classified under each BH. (For example, banana, lemon and orange are leaf products of the BH “fresh or chilled fruit”.) PPPs are to be derived for each of the 155 BHs, and full GDP-based PPPs are then obtained upon aggregating the BH PPPs using GDP expenditure weights.

A basket of leaf products for which prices have to be collected has to be determined for each region. While the same basket of items is adopted by the various participating countries/economies within a region, different regions have different baskets or product lists. The regional product list should contain, for each BH, sufficient items that are representative of each individual country in the region. The overall list may not be representative of any single country and every country has to price some products and services that are representative of other countries within the region. Moreover, clear and detailed characteristics or specifications of the items have to be spelt

out so as to ensure that comparable items are priced across countries in the region.

When the product list for a region has been agreed upon, price data of the products will be collected in each participating country/economy in the region for the purpose of calculating the PPPs. In particular, national annual average of purchaser's prices of leaf products are required. "Purchaser's price" refers to the amount actually paid by the purchaser to acquire the good or service; "annual" average prices are required to account for seasonal fluctuations of prices, especially for items like clothing and fresh food; and "national" average prices are needed considering the variation of prices across geographical locations within a country, especially between urban and rural areas. The price data are submitted by individual countries/economies to their respective ICP Regional Offices for conducting inter-country validation of data and compilation of the regional results.

Estimation of within-region PPPs

For each pair of countries, BH PPPs can be derived. Let PPP_{AB} denote the PPP between countries A and B. In deriving PPP_{AB} , only those items that can be priced in both countries A and B are relevant. Since the items for which each country can price are different, the basket of items being compared between countries A and B may not be identical to that between countries B and C.

Hence, the bilateral PPPs so derived may not be transitive. In other words, PPP_{AB} may not be equivalent to (PPP_{AC}/PPP_{BC}) .

Deriving PPPs multilaterally, instead of using pair-wise calculations, can ensure transitivity of the PPPs amongst more than two countries/economies. In ICP 2005, BH PPPs will be estimated using a stochastic method called CPRD, which stands for Country, Product, Representativity and Dummy.

The model underlying the CPRD method consists of the following equations:

$$(1) \quad p_{ijk} = \kappa \alpha_j \beta_i \gamma_k v_{ijk}$$

$$i = 1, 2, \dots, n; j = 1, 2, \dots, c; k = 1, 2$$

$$(2) \quad \alpha_1 = \beta_1 = \gamma_1 = 1$$

where p_{ijk} is the price for item i with degree of representativity k in country j , κ is a constant, α_j is a parameter for country j , β_i is a parameter for product i , γ_k is an indicator for representativity ($\gamma_1 =$ representative and $\gamma_2 =$ unrepresentative), and v_{ijk} is a random error term.

Equation (2) is used for determining the absolute levels of the prices. When $i = 1, j = 1$ and $k = 1$, the expected value of p_{ijk} is κ . This means that country 1 is taken as the reference country for the PPPs, and the first representative product in country 1 is taken as the "reference" product, with all prices being measured relative to its price.

Taking natural logarithm on both sides

of (1) and (2) gives the following equations:

$$(3) \ln p_{ijk} = \ln \kappa + \ln \alpha_j + \ln \beta_i + \ln \gamma_k + \varepsilon_{ijk}$$

$$(4) \ln \alpha_i = \ln \beta_i = \ln \gamma_i = 0$$

Equation (3) can be rewritten as follows, using three sets of dummy variables X_{ijk} , Y_{ijk} and Z_{ijk} which take the values of either unity or zero:

$$(5) \ln p_{ijk} = \ln \kappa + \ln \alpha_2 x_{i2k} + \ln \alpha_3 x_{i3k} + \dots + \ln \alpha_c x_{ick} + \ln \beta_2 y_{2jk} + \ln \beta_3 y_{3jk} + \dots + \ln \beta_n y_{njc} + \ln \gamma_2 z_{ij2} + \varepsilon_{ijk}$$

The parameters of equation (5) can be estimated by using least squares or multiple regression method. The expected price depends on the interaction of three factors: the country, the product and its representativity. As the coefficient of a representative product is fixed at unity, the coefficient of an unrepresentative product may be expected to be greater than unity. This is because the relative price of a representative product tends to be low as compared with the relative price of the same product in other places in which it is not representative.

Ring Comparison

After obtaining BH PPPs amongst the countries within each region, between-region BH PPPs are to be derived to link the BH PPPs between countries in different regions to arrive at the global results. Ring Comparison is the technical mechanism to serve this purpose in ICP 2005. 19 selected

countries, known as Ring Countries, comprising 2 or more countries from each of the 6 ICP regions, are taking part in this Ring Comparison. Each Ring Country has to collect prices for a list of products and services, known as the Ring List, in addition to those for the product list in its respective region. In drawing up the Ring List, the regional product lists have been studied and compared for identifying the overlapping items between regions and coming up with the product specifications which are representative enough amongst the Ring Countries.

Estimation of between-region PPPs

In choosing the method for linking regional comparisons to the global comparison, one important criterion is to maintain “fixity”, i.e. the within-region parities estimated for the six regions should remain unchanged in the between-region comparison. An extended version of the CPRD method will be adopted to estimate the between-region parities in ICP 2005. These parities, together with the within-region parities, are sufficient to derive a set of transitive parities for any pair of countries in the world.

The CPRD model explained in equations (1) to (5) above can be extended to include a parameter for each region. With six regions, only five regional parameters have to be estimated. As fixity is imposed,

all the within-region parities, denoted by α_j 's in the above, can be eliminated from the CPRD model. The prices in different countries within a region can be converted into a common regional numeraire currency by dividing them by the country parameter α_j . The between-region parity then measures the parity between the two numeraire currencies based on prices in all the countries in the two regions concerned after they have been converted into the numeraire currency.

Denote the converted prices by upper case P 's, i.e. P_{ikr} , which are defined as (p_{ijk}/α_j) . The extended CPRD model can be written as:

$$(6) \quad P_{ikr} = \kappa \beta_i \gamma_k \delta_r v_{ikr}$$

$$i = 1, 2, \dots, n; k = 1, 2; r = 1, 2, \dots, 6$$

$$(7) \quad \beta_l = \gamma_l = \delta_l = 1$$

As compared with equation (1), equation (6) does not contain any country parameters (i.e. the α_j 's) while regional parameters (i.e. the δ_r 's) have been added. The three explanatory variables in the extended CPRD model become Region (instead of country as in the CPRD model for estimating within-region parities), Product and Representativity. The between-region parities are the parities between six numeraire currencies.

Taking natural logarithm on both sides of (6) and (7), we have the following equations:

$$(8) \quad \ln P_{ikr} = \ln \kappa + \ln \beta_i + \ln \gamma_k + \ln \delta_r + \varepsilon_{ikr}$$

$$(9) \quad \ln \beta_l = \ln \gamma_l = \ln \delta_l = 0$$

A new set of dummy variables, denoted by V_{ikr} , are introduced for the regions. Equation (8) can be rewritten as:

$$(10) \quad \ln P_{ikr} = \ln \kappa + \ln \beta_2 y_{2kr} + \ln \beta_3 y_{3kr} + \dots + \ln \beta_n y_{nkr} + \ln \gamma_2 z_{i2r} + \ln \delta_2 v_{ik2} + \ln \delta_3 v_{ik3} + \dots + \ln \delta_6 v_{ik6} + \varepsilon_{ikr}$$

The parameters of (10) can again be estimated by using least squares or multiple regression method. The expected price depends on the interaction of three factors: the region, the product and its representativity.

Latest development of ICP 2005

The preliminary results on household consumption for the Latin American region comprising 10 countries have been released in June 2006. Based on the PPPs for 2005, the price level in Chile is the highest in the region, followed by Brazil and Uruguay. This means that the same basket of goods and services costs more in these countries than the rest of the region. On the other hand, after adjusting for the PPPs, Argentina has the highest per capita expenditure on household goods and services among the 10 countries, at over 60% higher than the regional average.

The release of other regional results will follow in end 2006 or early 2007. Meanwhile, price collection for the Ring Comparison is near completion. Publication

of the finalized global results by the World Bank is scheduled at the bottom half of year 2007. Upon availability of these results, the position of Hong Kong vis-à-vis other economies in the Asia and the Pacific region and other regions of the world can be compared.

References

Readers who are interested in this topic may refer to the website <www.worldbank.org/data/icp> maintained by the World Bank. Materials on ICP 2005 such as quarterly e-Newsletters, the ICP Handbook, related statistical publications, and papers on concepts and methodologies are available.

HKSS Professional Statistical Examination

HKSS Examination Board

The Examination Board* is glad to note that a very large proportion, one-third of candidates sitting for the 2005 round of professional statistical examination and half of those for the 2006 round, have successfully obtained certificates at various levels. A new modular form of syllabus for Higher Certificate examination will also be introduced by phase in 2007 and 2008.

A bilingual press release announcing the above achievements and developments was recently issued on 5th October 2006. This article gives a brief account on them. Some memorable photos are included as well.

Five rounds of the Examination successfully held

The Society has so far successfully conducted five rounds of the Examination since October 2001. Over 300 candidates

have sat for the Examination. Almost 100 candidates have obtained qualifications at various levels of the statistical profession.

For the May 2005 round of Examination, 62 examination associates / members of the Society registered for it : 16 for the Ordinary Certificate (OC) level, 12 the Higher Certificate (HC) level and 14 the Graduate Diploma (GD) level.

Of them, 14 candidates successfully obtained certificates at different levels. Their achievements are listed below :-

Awarded Ordinary Certificates in 2005

FUNG Wing-yiu, Kelvin (with distinction)
LAU Leung-hon
LEUNG Wing-kam, Amanda (with credit)
NG Po-wah (with credit)
SO Yee-kuen
WONG Wai-kei (with credit)
WU Pauline

* Membership of the Examination Board includes: Mr. HW Fung (Chairman), Ms Cecilia Chan (Hon. Secretary), Prof. PS Chan, Mr. John Lam, Prof. Stephen Lee, Mr. Raymond Tam and Dr. H Wong

Awarded Higher Certificates in 2005

LAM Wai-hung
LAM Ka-ping
WONG Wai-Kuen (with credit)
WONG Ho-ting (with credit)

Awarded Graduate Diploma Certificates in 2005

KONG Chi-leung
LEE Hoi-yi, Judith
WONG Kai-Choi (with credit)



(Candidates awarded certificates in the presentation ceremony on 18th October 2005)

For the May 2006 round of Examination, 61 candidates registered for it : 20 for the OC level, 23 HC level and 18 GD level.

Examination results were especially encouraging. The number of candidates awarded with certificates, at 29 for 2006, was a record high ever since. Among them, 15 obtained OC, 12 HC and two GD. More than one-third of them scored credits or distinctions.

Awarded Ordinary Certificates in 2006

CHAN Kam-hing, Sammi
CHAN Wing-yi
CHEUNG Chi-man
CHEUNG Ngai-chung
CHOI Wai-kit (with credit)
CHOW Yiu-kwok (with credit)
IP Hing-yip
LAI Kam-wah
LAM Tung-hei
LEUNG Yiu-keung
LO Pui-shan (with credit)
NGAI Ka-ho (with credit)
OR Kin-bun
PANG Chau-king
WU Siu-yin, Donna



(Candidates awarded certificates in the presentation ceremony on 23rd October 2006)

Awarded Higher Certificates in 2006

CHEUNG Cheuk-wai, Jeffrey (with credit)
CUI Rui (with credit)
HO Lai-yin (with credit)
LAU Wai-man (with credit)
LAU Tsz-kwan
LAW Siu-tong (with credit)
NG Po-wah
SHUM Kwok-shuen
SO Kwok-yin
WONG Chun-ching (with distinction)
WONG Tai-chi, Alick (with credit)
YIM Yik-man

**Awarded Graduate Diploma
Certificates in 2006**

LAM Kit-chi

YIP Sun-ping, Boris



(Candidates awarded certificates in the presentation ceremony on 23rd October 2006)

The certificates were signed by both the HKSS and the Royal Statistical Society (RSS). HKSS qualifications are considered fully equivalent to the UK RSS Examination. Moreover, the above lists of candidates awarded HKSS certificates were published in the Oct 2005 and Oct 2006 issues of the RSS NEWS. Congratulations to all of them!

The GD level examination consists of two papers in Statistical Theory and Methods, two papers in Applied Statistics and two half-papers in two Options Subjects. It normally takes two or more sittings to complete this level of examination. We are also glad to note a high passing rate in various papers of this level.

Below listed are seven candidates who have successfully passed some components of GD in 2005 and 2006 :-

CHAN Wai-kin

KWOK Chun-yu

LAM Wai-hung

LOK Man-wai Ray

NGAI Man-yeung

SUEN Ka-fai

TSUI Hing-on

New modular format of Higher Certificate examination

To cope with changes and provide greater flexibility, the syllabus of the HC examination will be changed into one with eight modules. Starting from 2007, this level of examination will also be offered in a modular form. It will consist of 8 modules. Each module will be examined by a 1.5-hour paper.

The beauty of the modular format is that a candidate can take each module separately and obtain certificate separately for each module.

Candidates who are successful in six modules including modules 1 to 4 (not necessarily all in the same session) will be awarded the HC. Candidates who wish to proceed to the GD should have been successful in modules 1 to 6. Candidates wishing to obtain HC qualification by taking 6 modules in the same session should first have passed or been exempted from OC.

Some of the modules (viz. module 1,2,7 and 8) will start to be offered for the year 2007 whilst the entire suite will come into place in 2008, by both the RSS and HKSS simultaneously. A list of main topics covered by each module is at Annex 1

The existing three-paper old format of the HC examination will continue to be available in 2007 and 2008, but will cease to be offered in 2009.

Fees revision

The Examination has been running on a self-financing basis since its 2005 round. To ensure that ends will meet even without external subsidy, the fees for registration, examination and exemptions are regularly reviewed every year.

To register for the Examination, applicants should either be full members or student members of HKSS. Under the new charging scheme, full members and student members shall pay a registration fee of \$200 and \$350 respectively. Non-members of HKSS may also take the Examination by enrolling as an examination associate. The annual subscription fee is \$400, which already includes registration fee for the Examination.

The revisions to examination fees for each paper are summarized at Annex 2. As for application for exemptions, an

administration charge of \$100 is required, followed by fees levied for issuing exemptions certificates at different qualification level.

The RSS has raised their examination fees every year over the past years. As such, despite the increases mentioned above, the fees for taking HKSS Examination will still be more than 20% lower than those of the RSS Examination in 2006 - 2007. Local candidates will therefore continue to enjoy the benefit of paying less by taking the Examination in Hong Kong.

New registration forms and examination guide

The registration forms, guide to examination and other relevant documents have suitably been revised to reflect the above changes. Rules on use of calculators at examination centre have also been more clearly specified.

Details can be found on the HKSS website at www.hkss.org.hk. Registration procedures, application forms and past papers etc. are also available for download at the website.

Briefing seminars

Briefing seminar cum certificate presentation ceremony was held annually to, inter alia, enable interested persons and HKSS members to know more about the latest developments of the Examination.

The Society also invited representatives from various tertiary institutions to introduce relevant statistics courses in their institutions to our Members.



(Guest Speakers of the 2005 Seminar)

Much gratitude must go to Prof May Wong and Prof Stephen Wu of HKU School of Professional and Continuing Education, Prof Tony Fung, our President, and Prof Stephen Lee of the University of Hong Kong, Prof Joseph Lee of Hong Kong Polytechnic University, as well as Mr. Raymond Tam of the Hong Kong Institute of Vocational Education, who shared with participants useful information about relevant courses in their institutions in the seminar held on 18th October 2005.



In the recent seminar held on 23rd October 2006, other than the above guest speakers, Dr. H Wong and Dr. WC Yip of Hong Kong Polytechnic University also joined us to share with participants about their teaching experience.



(Guest Speakers of the 2006 Seminar)

Mr. HW Fung, Chairman of the Examination Board, in briefing salient changes of the Examination, strongly advised students who planned to complete the HC in 2007 or 2008 to continue to sit for the HC examination in its old format (i.e. the three-paper format) in the coming two years.

More than 80 examination associates / members of the Society and students from tertiary institutions attended the seminars in 2005 and 2006. Most of the participants found the seminars informative and expressed gratitude for the opportunity to share experience with other fellows.

Next round of Examination

The coming round of Examination will take place in the Chinese University of Hong Kong during 15th – 17th May 2007. Invigilation will continue to be provided by the Hong Kong Examinations and assessment Authority, to ensure that the Examination is conducted on a fair and independent basis.

Applications for exemption and registration

Candidates may apply for exemptions for different levels of the HKSS examination, provided they have the relevant academic qualifications from tertiary or vocational institutes. Applications for exemptions and registration must reach the HKSS Examination Office not later than 31st January 2007.

Modular Format of the Higher Certificate Examination

HC Modules to be offered in 2007	
Module 1 : Data collection and interpretation	Module 2 : Probability models
<ul style="list-style-type: none"> • Summarizing and interpreting data • Surveys • Exploratory analysis • Report writing • Interpretation of published data 	<ul style="list-style-type: none"> • Probability • Distributions • Properties of distributions
Module 7 : Time series and index numbers	Module 8 : Survey sampling and estimation
<ul style="list-style-type: none"> • Time series • Index numbers • Deflation • Re-basing • Chain linking • Seasonal adjustment of indices • Use of index numbers 	<ul style="list-style-type: none"> • Populations and frames • Non-probability sampling methods • Sampling methods • Simple random sampling • Stratified random sampling • Calibration techniques for estimation • Bias / variance trade off • Application of sampling methods
HC Modules further available in 2008	
Module 3 : Basic statistical methods	Module 4 : Linear models
<ul style="list-style-type: none"> • Inference • Non-parametric methods 	<ul style="list-style-type: none"> • Correlation • Design of experiments • Regression • Analysis of variance
Module 5 : Further probability and inference	Module 6 : Further applications of statistics
<ul style="list-style-type: none"> • Bivariate distributions • Generating functions • Inference 	<ul style="list-style-type: none"> • Design and analysis of experiments • Multiple regression • Quality control and acceptance sampling

Examination Registration Fees and Examination Fees

Category of membership	Examination registration fees (per sitting for examination) (w.e.f. 1st Oct 2006)
Full members	HK\$ 200 (in addition to \$200 membership)
Student members	HK\$ 350 (in addition to \$50 membership)
Examination Associates	HK\$ 400 (including enrolment fees and registration fees)
Notes : 1) An administration fees of \$100 will be required for each application for academic assessment. 2) Charges will also be levied when issuing certificates of exemptions at different levels.	

Examination fees		2007 (w.e.f. 1st Oct 2006) HK\$
Ordinary Certificate	All two papers	1,380 for all two papers
Higher Certificate	All three papers (existing three-paper format)	2,070 for all three papers
	New modular format	450 per module (or 2,700 for all six modules)
Graduate Diploma	Statistical Theory and Methods or / Applied Statistics	1,520 for each set of Papers I and II
	Options paper	760 per paper
	All five papers	3,800

News

Census and Statistics Department

With effect from 28 September 2006, Mr. Leslie TANG Wai-kong assumes the office of Assistant Commissioner (Economic)¹ of Census and Statistics Department vice Miss Josephine LAU Ching-mui on pre-retirement leave.

Department of Statistics and Actuarial Science, the University of Hong Kong

Dr Tony Wing-Kam FUNG was promoted to Chair Professor of Statistics in April, 2006.

Dr Kai Wang NG was promoted to Professor in June, 2006, before his retirement from the Department. He is now the College Deputy Principal, HKU SPACE Community College, the University of Hong Kong.

Drs Beda CHAN, Jennifer CHAN and Paul YAU, Teaching Consultants, have left the Department in the summer of 2006.

Dr Louis NG, FSA and Dr Chi Wai KWAN have recently joined the Department as Teaching Consultants.

The Patrick Poon Lecture Series in Actuarial Science 2006: “*On Reinsurance*” was delivered by Professor Jef Teugels, Catholic University of Leuven, Belgium, on November 3, 2006. The lecture was well received.