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A Comparative Analysis of Credit Union Savings and Loans in Hong Kong and Taiwan under the Macroeconomic Environment

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A Comparative Analysis of Credit Union Savings and Loans In Hong Kong and Taiwan under the Macroeconomic Environment

(Che-cheong Poon)[1]

The individual household faces a monopolistic or imperfect financial market. It has little or no bargaining power. For its savings it receives simply a going rate. The market for installment loans is still disorganized and characterized by high interest charges, often concealed and confused. Thus there is a strong incentive for households to unite in a credit union. (Croteau 1963, p.164)

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1. Introduction

Jack Dublin in his book (1971, p.9), *Credit Unions: theory and practice,* gave the following definition: "A credit union is a cooperative, designed to provide its members with an efficient, inexpensive saving-and-loan service." This definition has provided a clear description of the essence of credit unions. More specifically, credit unions are organizations of people for people, they exists only to serve their members.

Membership in a credit union is voluntary and open to all within the accepted common bond[2] of

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[2] The common bond (or bond of association) is the legally approved criteria, which specifies who may become a member of the credit union. It may be for people living or working in the same area, people working for the same employer or people who belong to the same association, such as a church or trade union.

association that can make use of its services and are willing to accept the corresponding responsibilities. According to Raiffeisen (Moody and Fite 1984), to become a member of a credit union a person applied and was admitted if his neighbors judged him to be of good character, industrious, and friendly. Raiffeisen also stressed volunteer work in all credit unions, allowing compensation only to full-time cashiers. Besides, the promotion of thrift and the wise use of credit as well as education are essential to the dual social and economic character of credit unions in serving members' needs. In keeping with their self-help and mutual-help principles, credit unions actively cooperate with other credit unions, cooperatives and their associations at local, national, and international levels in order to best serve the interests of their members and their communities.

Credit unions differ from other business enterprises in four key ways. (1) A different purpose: The primary purpose of credit unions is to meet the common needs of their members, whereas business enterprises are to maximize shareholders' profit; (2) a different control structure: credit unions use the one-member-one-vote system, not the one-vote-per-share system used by business enterprises. This helps the credit union to serve the common need rather than the individual need, and is a way to ensure that people, not capital, control the organization; (3) a different allocation of profit: credit unions share profits among their member-owners on the basis of how much they use the credit union services, not on how many shares they hold as that in business enterprises. Credit unions also tend to invest their profits in improving service to members and promoting the wellbeing of their communities; and (4) a different remuneration system: not like directors of business enterprises that are entitled to director's fee, director's interest and director's remuneration, credit union directors are not allowed by law to receive remuneration from the credit union.

Beginning in Germany with Schulze-Delitzsch and Raiffeisen in the mid-nineteenth century, the credit union movement diffused to other parts of Europe, to Canada in 1901, to the United States in 1908, and then to Australia in 1946. Following World War II, credit unions developed throughout many parts of the world. The credit union movement spread to Asia in 1938 and was first started in the Philippines and then extended to other Asian countries including Hong Kong and Taiwan.

Led by the Catholic Jesuit Society, the credit union movement in Hong Kong and Taiwan started to develop after the one-month conference hosted by the Committee for the Development of Socio-economic Life in Asia (SELA) which was held in Bangkok in May 1963. Since then, the credit union concept has been introduced to these two regions and was quickly accepted among the middle and lower income groups. Forty-five years after the establishment of the first credit union in

Hong Kong (the St. Francis Credit Union) and Taiwan (the Sacred Heart Credit Union) in 1964, there were 44 credit unions with 72,286 members in Hong Kong and 336 credit unions (in 15 Chapters and the Kinmen area) with 201,486 members in Taiwan in 2009. Although there had been a rapid growth in credit unions in terms of membership, share balance and outstanding loans in the 1970s and 1980s, the credit union movements in these two regions have been stagnant over the last decade.

The major functions of the credit union are to receive the savings of its members and through personal loans to serve their credit needs. Following a comprehensive analysis of the economics of credit union savings and lending that appeared in the book written by John T. Croteau (1963), a number of articles has been written examining the relation between credit union savings and loans. Douglas and Isherwood (1978) demonstrated that saving and borrowing are socially constructed as moral opposites — posing the choice between frugality and greed or between meanness and pleasure; however, in other ways, saving and borrowing are similar. On the other hand, Lunt and Livingstone (1991) advocated that both saving and borrowing involve participation and choice as a citizen in modern consumer society. A study by Modigliani (1970) has suggested that we may expect some people to both save and borrow, or indeed, we may expect other people to avoid both; however, Loggett and Stewart (1999) have provided empirical evidence that credit unions are saver-oriented and argue that saving and borrowing are often seen as opposites, with saving as thrifty and borrowing as feckless. Furthermore, there are a number of studies of savings motives (Warneryd, 1989; Lunt and Livingstone, 1991) and a few studies of the psychological correlates of debt (Lunt and Livingstone, 1992), but these studies have not tended to examine the relation between motivations to save and the psychology of debt largely because it has been assumed that people are either saving or in debt.

We are aware that the loan-to-savings ratios in both Hong Kong and Taiwan credit unions have been dropped substantially in line with the decline in banking lending business since 1998. In recent years, it is also worth noting that the credit union loan-to-savings ratios in Hong Kong were markedly lower that those in Taiwan. The research objective of this article is to compare the credit union savings and loan services in Hong Kong with those in Taiwan in the hope of providing hints for establishing development direction. In order to achieving this objective we will develop a macroeconomic analysis of how the aggregate level of credit union savings and loans changes over time and which factors influence these changes. To do this, we will start by selecting a group of variables that can mirror the macroeconomic environment and providing a general description of

the characteristics of the time series of these chosen variables, we will then go on to use the correlation coefficients to identify the forces behind the trend movement of credit union savings and loans; and finally, we will examine the credit union savings and borrowing behavior of the credit unions by looking at the loan-to-savings ratio over the business cycles.

2. Background Information and the Dataset

Probably the most important credit union objective is to promote regular saving. Experience seems to show that unless an individual gets into the habit of saving money regularly, he will find it very difficult to save any money at all. If an individual does develop the habit of regular saving, he will find that his savings seem to accumulate faster than he had expected; on the other hand, if an individual has poor saving habits, he will often get into financial difficulties. Savings in credit unions are called "shares" (each of which is HK$5 in Hong Kong and NT$100 in Taiwan), and in practice a "share" may be withdrawn on demand[3]. To encourage thrift through savings and thus to provide loans and other services, a fair rate of interest is paid on savings, within the capability of the credit union. "Dividends" on credit union shares are treated as ordinary interest income, and the calculation of dividend[4]is based on the 12-month share balance of the member during each financial year of individual credit unions. The Board of Directors recommend the rate of dividend and after the members' acceptance in the Annual Meeting and dividend will be paid directly to the account of each member. Hong Kong Credit Unions Ordinance specifies that the rate of dividend should not exceed 6% per annum, but there is no such requirement in Taiwan[5].

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[3] A member may withdraw from the credit union by giving a writing application to the credit union and be consented by the board of directors.

[4] During each financial year, the Board shall set aside a reserve fund of not less than 20% of the net earnings for the previous financial year before the declaration or payment of any dividend in relation to the previous financial year. (Credit Union Ordinance, section 45)

[5] Article 15 of the ROC Credit Union Act states that annual surpluses of credit unions are allotted or distributed in the following order: (1) Compensate accumulated losses; (2) Interest Refund; (3) Set aside as the Reserve more than twenty percent (20%); (4) Set aside as the Public Welfare Fund and Education Fund not less than five percent (5%); and (5) Dividends.

In addition to promoting thrift among its members and to receiving the savings of its members, another object of a credit union is to make loans for provident or productive purposes to its members. A credit union loan has some very special features: they are insured at no direct cost to the eligible member, repayment protection insurance is available as an optional extra, there are no hidden fees or transaction charges, repayments are calculated on the reducing balance of the loan (this means smaller interest repayments as you repay your loan), repayment terms are arranged to suit members' particular circumstances, and members can repay the loan earlier or make larger repayments than agreed with no penalty or additional charges.

Although both of the Hong Kong Credit Union Ordinance and the ROC Credit Union Act define a maximum loan in that no one loan may be greater than 10 per cent of the aggregate amount of the share balance, the reserve fund and any other funds of the credit union (a figure rarely reached), in practice only the current savings and repayment capacity of the member limits the size of the loan. Taking the unsecured loan as an example, most credit unions in Hong Kong tend to set a credit limit to the potential borrower of not more than 10 times his share balance or HK$40,000 (whichever is the least). Most of the credit union loans were for provident purposes including house renovation, education, vacation abroad, emergency medical treatments, funeral and purchases of durable consumer goods. Besides, some big credit unions even provide loans for specific purposes (larger loan amount and interest rate concessions), such as for tax payment, apartment purchase, purchase of a new vehicle, decoration on a newly purchased apartment, payment of other loans, and funeral expenses for members' immediate relatives. According to the Hong Kong Credit Union Ordinance, the interest rate on any loan made by a credit union to a member cannot exceed 1 % per month on the total of unpaid balance of any such loan plus charges (if any) made by the credit union in making the loan; but there is no such requirement in Taiwan.

Theoretically, the trend movement of savings and borrowing in a particular depository institution should be associated with that in the commercial banking system, and in turn bank deposits and loans are expected to be affected by bank rates which are determined by national income, and the general price level. And thus, in addition to credit union share balances (savings) and outstanding loan balances reported by the Credit Union League of Hong Kong (CULHK) and the Credit Union League of Republic of China (CULROC), we included total bank deposits, total bank loans, bank 12-month time deposit interest rate, the prime bank lending rate, GDP at current market prices, and the consumer price index in the dataset which are used to represent the macroeconomic

environment.

In choosing these macroeconomic variables, two points have to be noted. First, we chose GDP at current market prices (nominal GDP) rather than GDP at constant market prices (real GDP) because the movements in nominal GDP and general price level have already reflected the movement in real GDP. Second, we chose the period average rather than the end-of-period interest rates, because the calculation of interest income and interest payment for a given period is based on the product of the weighted average of interest rates prevailing in that period and the respective savings/loan balance, not the product of the interest rate and the savings/loan balance at the end of the interest period. Since the performance of credit union loans in Hong Kong and Taiwan has been greatly influenced by the East Asian Financial Crisis in 1998[6], we will concentrate our analysis over a time span 10 years after and 10 years before the Crisis; that is, the observed period is from 1989 to 2009. In order to give a clear picture of the trend movement of these time series and to facilitate the analysis, the annual rates of change as well as the level of the dataset used in this study are listed in Tables 1 to 4 below.

[6] The East Asian Financial Srisis (or Currency Turmoil) started in Thailand with the collapse of the Thai baht in July 1997 and quickly spread to the rest of the region.

Table 1 Credit Union Savings, outstanding Loan Balances and Major Macroeconomic Variables in Hong Kong: 1989 – 2009

Year	HKGDP	HKBD	HKBL	HKCUS	HKCUL	HKBDR	HKBLR	HKCPI
1989	536,268	358,130	474,343	174.67	148.16	8.04	10.54	57.9
1990	598,650	421,560	542,902	212.58	178.83	8.17	10.46	63.8
1991	690,324	540,193	644,149	246.01	209.14	6.96	9.41	71
1992	805,082	602,773	719,741	343.82	276.90	4.57	7.32	77.8
1993	927,996	770,865	859,198	475.71	352.64	3.75	6.50	84.6
1994	1,047,470	896,330	1,006,569	569.36	439.11	5.18	7.26	92.1
1995	1,115,739	1,103,010	1,105,785	811.68	595.60	2.26	8.96	100.4
1996	1,229,481	1,346,774	1,302,327	980.82	677.61	5.19	8.52	106.7
1997	1,365,024	1,479,644	1,556,853	1,116.33	866.62	6.39	8.83	113
1998	1,292,764	1,602,123	1,521,714	1,131.80	939.18	8.31	9.94	116.2
1999	1,266,668	1,734,675	1,455,650	1,311.43	853.07	5.76	8.49	111.6
2000	1,317,650	1,834,354	1,502,489	1,421.52	882.95	5.40	9.22	107.4
2001	1,299,218	1,835,557	1,507,355	1,861.98	789.70	2.53	7.00	105.7
2002	1,277,314	1,803,988	1,490,679	2,667.00	725.76	0.74	5.11	102.4
2003	1,234,761	1,914,413	1,464,532	2,280.88	652.57	0.12	5.00	99.8
2004	1,291,923	2,005,942	1,581,493	4,101.27	569.44	0.27	5.02	99.4
2005	1,382,590	2,130,744	1,797,350	4,441.74	546.85	1.75	6.12	100.3
2006	1,475,357	2,567,559	1,917,437	4,597.70	592.63	3.02	7.90	102.4
2007	1,615,455	3,074,472	2,184,705	4,690.70	583.00	2.79	7.59	104.4
2008	1,675,171	3,033,499	2,395,394	5,010.90	658.00	0.97	5.39	108.9
2009	1,633,535	3,373,209	2,401,323	6,050.10	671.50	0.30	5.00	109.5
MG 1989-2009	5.73%	11.87%	8.45%	19.39%	7.85%	n.a.	n.a.	3.24%
MG 1989-1999	8.98%	17.09%	11.87%	22.34%	19.13%	n.a.	n.a.	6.78%
MG 1999-2009	2.58%	6.88%	5.13%	16.52%	-2.36%	n.a.	n.a.	-1.90%

Notes:

HKGDP = GDP at current market prices in HK$M

HKBD = Total deposit from customers with licensed banks of which in HKD (HK$M)

HKBL = Total loans and advances with licensed banks of which in HKD (HK$M)

HKCPI = Composite Consumer Price Index (October 2004 - September 2005 = 100)

HKBLR = Best lending rate (period average)

HKSDR = Bank Savings deposit interest rate (period average)

HkCUS = Credit Union Savings /Share Balances (HK$M)

HKCUL = Credit Union Outstanding Loan Balances (HK$M)

$MG_{t\text{-}t+n}$ = Mean growth rate $= \left(\sqrt[n]{\frac{X_{t+n}}{X_n}} - 1 \right) \times 100\%$

Sources:

2009 Gross Domestic Product, Hong Kong Census and Statistics Department, 2010.

Hong Kong Annual Digest Statistics, Hong Kong Census and Statistics Department, various editions.

Hong Kong Census and Statistics Department Website at: http://www.censtatd.gov.hk/showtableexcel2.jsp?tableID=052&charsetID=1

Hong Kong Monetary Authority Website at: http://www.info.gov.hk/hkma/eng/statistics/msb/attach/T060402.xls

Annual Report, Credit Union League of Hong Kong, various editions.

Table 2 Interest Rates, Annual Rates of Changes in Credit Union Savings, outstanding Loan Balances and Major Macroeconomic Variables in Hong Kong: 1990 - 2009

%

Year	HKGDPG	HKBDG	HKBLG	HKCUSG	HKCULG	HKBDR	HKBLR	HKCPIG
1990	11.63	17.71	14.45	21.70	20.70	8.17	10.46	10.20
1991	15.31	28.14	18.65	15.72	16.95	6.96	9.41	11.60
1992	16.62	11.58	11.74	39.76	32.40	4.57	7.32	9.60
1993	15.27	27.89	19.38	38.36	27.35	3.75	6.50	8.80
1994	12.87	16.28	17.15	19.69	24.52	5.18	7.26	8.80
1995	6.52	23.06	9.86	42.56	35.64	2.26	8.96	9.10
1996	10.19	22.10	17.77	20.84	13.77	5.19	8.52	6.30
1997	11.02	9.87	19.54	13.82	27.89	6.39	8.83	5.80
1998	-5.29	8.28	-2.26	1.39	8.37	8.31	9.94	2.80
1999	-2.02	8.27	-4.34	15.87	-9.17	5.76	8.49	-4.00
2000	4.02	5.75	3.22	8.39	3.50	5.40	9.22	-3.80
2001	-1.40	0.07	0.32	30.98	-10.56	2.53	7.00	-1.60
2002	-1.69	-1.72	-1.11	43.23	-8.10	0.74	5.11	-3.00
2003	-3.33	6.12	-1.75	-14.48	-10.08	0.12	5.00	-2.60
2004	4.63	4.78	7.99	79.81	-12.74	0.27	5.02	-0.40
2005	7.02	6.22	13.65	8.30	-3.97	1.75	6.12	1.00
2006	6.71	20.50	6.68	3.51	8.37	3.02	7.90	2.00
2007	9.50	19.74	13.94	2.02	-1.63	2.79	7.59	2.00
2008	3.70	-1.33	9.64	6.83	12.86	0.97	5.39	4.30
2009	-2.49	11.20	0.25	20.74	2.05	0.30	5.00	0.50
Mean	5.94	12.23	8.74	20.95	8.91	3.72	7.45	3.37
SD	6.87	9.23	8.12	20.66	15.61	2.64	7.77	5.13
CV	1.16	0.75	0.93	0.99	1.75	0.71	1.04	1.52

Notes:

HKGDPG = Nominal GDP annual growth rate

HKBDG = Annual growth rate of total deposit from customers with licensed banks of which in HKD

HKBLG = Annual growth rate of total loans and advances with licensed banks of which in HKD

HKCPIG = Consumer inflation rate

Mean = The arithmetic mean of the annual rates of change

CV = Coefficient of variation; $CV = \frac{SD}{Mean} \times 100\%$

HKBLR = Best lending rate (period average)

HKSDR = Bank Savings deposit interest rate (period average)

HKCUSG = Annual growth rate of credit union savings

HKCULG = Annual growth rate of credit union outstanding loan balances

SD = Standard deviation

Table 3 Credit Union Savings, outstanding Loan Balances and Major Macroeconomic Variables in Taiwan: 1989 – 2009

Year	TWGDP	TWBD	TWBL	TWCUS	TWCUL	TW BDR	TW BLR	TWCPI
1989	4,003,227	5,865,800	4,155,100	4,401.25	4,753.76	9.50	10.38	71.78
1990	4,430,055	6,471,500	4,649,400	5,183.42	5,644.20	9.50	10.00	75.06
1991	4,958,220	7,576,500	5,694,900	6,080.07	6,621.17	8.26	8.65	77.97
1992	5,534,544	9,073,700	7,276,100	7,364.21	8,061.46	7.79	8.30	80.63
1993	6,110,101	10,454,400	8,439,000	8,794.76	9,888.25	7.59	8.03	84.36
1994	6,685,505	12,031,400	9,904,400	10,332.48	11,802.08	7.29	7.94	86.60
1995	7,277,545	13,130,900	10,802,800	11,642.20	13,350.20	6.73	7.67	90.56
1996	7,906,075	14,260,900	11,205,200	12,564.68	13,455.55	6.02	7.38	92.85
1997	8,574,784	15,421,300	12,510,200	13,994.43	13,493.05	6.03	7.50	93.09
1998	9,204,174	16,696,900	13,177,300	14,688.44	13,735.12	5.44	7.70	95.06
1999	9,649,049	18,064,200	13,760,100	15,152.39	12,787.47	5.03	7.67	95.20
2000	10,187,394	19,308,700	14,428,900	15,744.17	13,060.88	5.00	7.71	96.77
2001	9,930,387	20,160,700	14,036,600	15,985.87	12,574.77	2.41	7.38	95.14
2002	10,411,639	20,609,800	13,731,400	16,516.16	12,217.26	1.86	7.10	95.86
2003	10,696,257	21,746,900	14,332,900	17,079.88	11,503.61	1.40	3.43	95.81
2004	11,365,292	23,256,500	15,867,800	17,658.63	11,059.14	1.52	3.52	97.36
2005	11,740,279	24,709,500	17,158,300	18,192.84	10,919.04	1.99	3.85	99.51
2006	12,243,471	25,942,000	17,598,900	18,401.68	11,047.39	2.20	4.12	100.18
2007	12,910,511	26,208,800	18,021,700	18,490.38	11,090.93	2.62	4.31	103.52
2008	12,620,150	27,977,900	18,470,100	18,626.86	11,023.21	1.42	4.21	104.83
2009	12,477,182	29,555,900	18,607,500	18,856.19	10,411.28	0.89	2.56	104.57
MG 1989-2009	5.85%	8.42%	7.78%	7.55%	4%	n.a.	n.a.	1.2%
MG 1989-2000	8.42%	11.90%	12.72%	13.16%	10.40%	n.a.	n.a.	2.86%
MG 2000-2009	2.60%	5.05%	3.06%	2.21%	-2.03%	n.a.	n.a.	0.94%

Notes:

TWGDP = GDP at current market prices (NT$M)

TWBD = Total deposit from Individuals and Business units of which in NTD (NT$M)

TWBL = Total loans and advances with major financial institutions of which in NTD (NT$M)

TWCPI = CPI = Consumer Price Index (2006 = 100)

TWBLR = Prime lending rate (period average)

TWSDR = Bank 1 year deposit interest rate (period average)

TWCUS = Credit Union Savings /Share Balances (NT$M)

TWCUL = Credit Union Outstanding Loan Balances (NT$M)

$MG_{t\text{-}t+n}$ = Mean growth rate $= \left(\sqrt[n]{\frac{X_{t+n}}{X_n}} - 1 \right) \times 100\%$

Sources:

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http://www.cbc.gov.tw/public/Attachment/0112516294971.XLS
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Annual Report, Credit Union League of PRC, various editions.

Table 4 Interest Rates, Annual Rates of Changes in Credit Union Savings, outstanding Loan Balances and Major Macroeconomic Variables in Taiwan: 1990 - 2009

%

Year	TWGDPG	TWBDG	TWBLG	TWCUSG	TWCULG	TWBDR	TWBLR	TWCPIG
1990	10.66	10.31	11.90	17.77	18.73	9.50	10.00	4.57
1991	11.92	17.07	22.49	17.30	17.31	8.26	8.65	3.88
1992	11.62	19.76	27.77	21.12	21.75	7.79	8.30	3.41
1993	10.40	15.22	15.98	19.43	22.66	7.59	8.03	4.63
1994	9.42	15.08	17.36	17.48	19.35	7.29	7.94	2.66
1995	8.86	9.14	9.07	12.68	13.12	6.73	7.67	4.57
1996	8.64	8.61	3.72	7.92	0.79	6.02	7.38	2.53
1997	8.46	8.14	11.65	11.38	0.28	6.03	7.50	0.26
1998	7.34	8.27	5.33	4.96	1.79	5.44	7.70	2.12
1999	4.83	8.19	4.42	3.16	-6.90	5.03	7.67	0.15
2000	5.58	6.89	4.86	3.91	2.14	5.00	7.71	1.65
2001	-2.52	4.41	-2.72	1.54	-3.72	2.41	7.38	-1.68
2002	4.85	2.23	-2.17	3.32	-2.84	1.86	7.10	0.76
2003	2.73	5.52	4.38	3.41	-5.84	1.40	3.43	-0.05
2004	6.25	6.94	10.71	3.39	-3.86	1.52	3.52	1.62
2005	3.30	6.25	8.13	3.03	-1.27	1.99	3.85	2.21
2006	4.29	4.99	2.57	1.15	1.18	2.20	4.12	0.67
2007	5.45	1.03	2.40	0.48	0.39	2.62	4.31	3.33
2008	-2.25	6.75	2.49	0.74	-0.61	1.42	4.21	1.27
2009	-1.13	5.64	0.74	1.23	-5.55	0.89	2.56	-0.25
Mean	5.94	8.52	8.15	7.77	4.44	4.55	6.45	1.91
SD	4.34	4.85	7.99	7.21	10.13	2.77	2.17	1.80
CV	0.73	0.57	0.98	0.93	2.28	0.61	0.96	0.94

Notes:

TWGDPG = Nominal GDP annual growth rate

TWBDG = Annual growth rate of total deposit from Individuals and Business unit of which in NTD

TWBLG = Annual growth rate of total loans and advances with major financial institutions of which in NTD

TWCPIG = Consumer inflation rate

TWBLR = prime lending rate (period average)

TWSDR = Bank 1 year deposit interest rate (period average)

TWCUSG = Annual growth rate of credit union savings

TWCULG = Annual growth rate of credit union outstanding loan balances

Mean = The arithmetic mean of the annual rates of change

SD = Standard deviation

CV = Coefficient of variation; $CV = \frac{SD}{Mean} \times 100\%$

3. Movements in Credit Union Savings and Loans

In earlier days there was little financing of consumption. People saved from earnings until they accumulated enough to make consumption purchases. As incomes increased, installment buying became common, and borrowing for consumption purchases has become widely accepted. Thus, depending on the choice the people make, a household may save prior to consumption, or it may secure the article, enjoy it, and pay for it on the installment plan, or a consumption loan. Based on the fact that both saving and borrowing are generally positively correlated with income, a household may use either of them to even out varying incomes or varying needs over the life course. That is, savings provide present resources drawn from past income and borrowing provides present resources drawn from future income. Note in particular that a unique characteristic of the credit union industry relative to the banking industry is its volunteerism. Because there is no exploitation between savers and borrowers, we have reason to expect the market mechanism of the loanable funds market will function much more efficiently in the credit union industry than in the banking industry provided that the interest rate is market determined. However, the rigidity of credit union interests and the credit union membership constraint often make the loanable funds market for a particular credit union unclear.

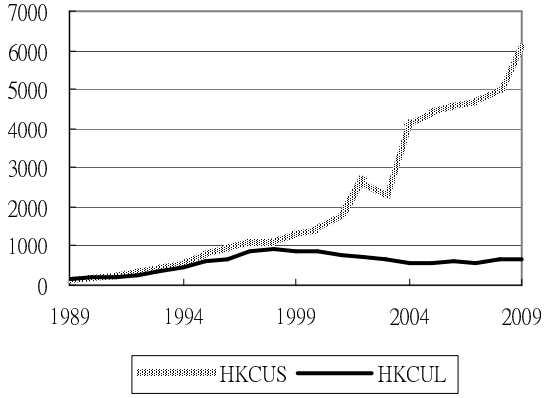
In Hong Kong, as shown in Tables 1 and 2, the amount of credit union savings and loans have increased from HK$148.16 million and HK$174.67 million in 1989 to HK$6,050 million and HK$671.5 million in 2009 with a mean growth rate (MG) of 19.39% and 7.852% respectively. However, the volatility of credit union savings and loans as measured by the standard deviation (20.66 and 15.61 respectively) were ranked the highest among the listed variables. These observations provide good evidence that the credit union industry in Hong Kong has to face the problem of external drain of funds, and consequently, credit unions in Hong Kong have to keep a higher reserve-to-deposit ratio then licensed banks so as to achieve a sound liquidity position. In Taiwan, as shown in Tables 3 and 4, the amount of credit union savings and loans have increased from NT$4,401.25 million and NT$4,753.76 million in 1989 to 18,856.19 million and NT$10,411.28 million in 2009 with a mean growth rate (MG) of 7.55% and 4% respectively.

In order to investigate the performance of credit union savings and loan services during economic recessions and expansions, we have calculated the mean growth rate for the listed variables in the periods before and after the East Asian Financial Crisis in 1998 (see $MG_{1989\text{-}1999}$ and $MG_{1999\text{-}2009}$ at the bottom of Tables 1 and 2). We can see the mean growth rate (MG) of all the listed variables have dropped drastically after the financial crisis. The statistics suggest at least three important points: first, an extraordinary high mean growth of credit union savings in Hong Kong; second,

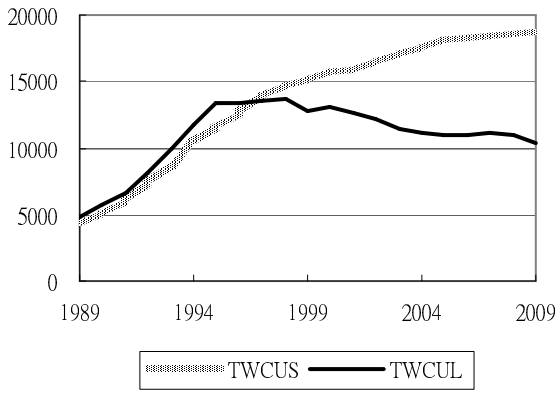
while bank loans could managed a 3-5% mean growth rates ($MG_{1999-2009}$), both of the credit union loans in Hong Kong and Taiwan have recorded a negative mean growth rate; and the final point is that the mean growth rates of credit union savings were always greater than the mean growth rates of credit union loans no matter there was an economic upturn or downturn. The movements of credit union savings and loans over the last two decades are depicted in Figure 1 below:

Figure 1 Time plots of credit union savings and loans: amount

a. Hong Kong (HK$M)



b. Taiwan (NT$M)



Sources: see Tables 1 and s3

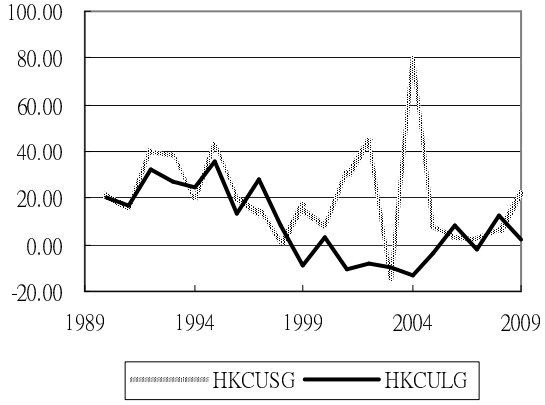
An economic time series may be assumed to define an underlying pattern of development subject to the law of diminishing marginal productivity. The curve portrays cumulative expansion to a maximum value, but this expansion proceeds by decreasing relative amounts beyond the maximum and must eventually fall. In Figure 1, both of the credit union loans in Hong Kong and in Taiwan (HKCUL and TWCUL) have reached it maximum value in 1998 and then started to decline gradually. This may be due mainly to the fact that the credit union members tended to borrow more from commercial banks than from their credit unions because the cost of borrowing from the latter is lower. Furthermore, by extrapolating the trend movements of the credit union loans in these two regions, we have strong evidence to say that the development of HKCUS has been at the stage of cumulative expansion, and the development of TWCUS has been continually approaching to its upper limit. Furthermore, it is worth noting that the discrepancies between credit union savings and loans in both Hong Kong and Taiwan have been widened since the late 1990s. The consequences of the drop in credit union loan-to-savings ratio will be explained in Section 5.

Figures 2a and 2b below show the annual rate of change in credit union savings and loans in Hong

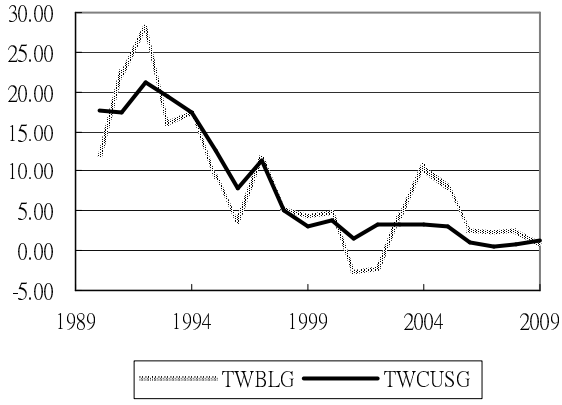
Kong and in Taiwan respectively. In addition to the high volatility of credit union savings as mentioned earlier, we can see credit union savings in Hong Kong (HLCUSG) was more unstable than that in Taiwan (TWCUSG) during the observed period. This has reflected the general practice of credit union members in Hong Kong to use their credit union savings as the first line of defense against unforeseen emergencies, whereas the credit union members in Taiwan view their credit union savings as a lifelong savings. Besides, it is interesting to mention that the annual rate of changes in credit union savings and loans in Hong Kong and those in Taiwan have been on a downward trend over the last two decades: a slight downward trend in Hong Kong, a heavy downward trend in Taiwan, and credit union loan growth outpacing savings growth.

Figure 2 Time plots of credit union savings and loans: annual rate of changes (%)

a. Hong Kong



b. Taiwan



Sources: see Table 2 and 4

4. **Correlation analysis**

Statistically, the strength of a relationship, or the association, between two variables is typically measured by the Pearson correlation coefficient[7], whose values range from –1 for perfect negative

[7] The Pearson correlation coefficient is a measure of the degree of closeness of the linear relationship between two variables. The definitional formula for the correlation coefficient between X and Y is:

correlation up to +1 for a perfect positive correlation. Since the correlation coefficients listed in Table 5 are calculated from a small observation, we have to conduct a test of significance of these sample correlation coefficients in order to determine whether there is any evidence of a statistically association between a pair of random variables. The population correlation coefficient "ρ" is hypothesized to be equal to 0 ($\rho_o = 0$). Thus, the null and alternative hypotheses are H_0: ρ = 0 (no correlation) and H_1: ρ ≠ 0 (has Correlation). The test statistic (follows a Student's t distribution with n-2 degree of freedom) for determining the existence of a significant correlation is given by the following equation (See Berensan, Levine, and Krehbiel 2009, pp637-639):

$$t = \frac{r - \rho_o}{\sqrt{\left(1 - r^2\right)/(n-2)}} = \frac{r}{\sqrt{\left(1 - r^2\right)/(n-2)}}$$

Since the fluctuations of most of the time series (except the interest rate series) listed in Tables 1 and 3 were positively correlated and the trends were in the same direction, correlating the data without adjusting for trend would result in increasing the positive correlation coefficient (Croxton, Cowden and Klein, 1982, pp 480-488); to avoid overestimating, we used the annual rates of change listed in Tables 2 and 4 to calculate the correlation coefficients. The correlation matrix of the listed variables from 1990 to 2009 is shown in Table 5. Given the total number of observations n = 20 (i.e., the degrees of freedom df = n – 2 = 18) and by setting the significance level α = 1% (99% confidence level), we got the two-tailed critical t-value of 2.8785 from the Student's t distribution table, and the corresponding computed critical correlation coefficient is 0.5615. Thus, for those correlation coefficients whose values are less than 0.5615, we cannot reject the null hypothesis that their population correlation coefficient "ρ" is equal to 0; that is, there is no evidence of a significant association between the corresponding pair of random variables statistically.

$$r = \frac{Cov(XY)}{\sqrt{\text{var}(X) \cdot Var(Y)}}$$

Table 5 The correlation matrix of Interest Rates and Annual Rates of Changes in Credit Union Savings, Outstanding Loan Balances and Major Macroeconomic Variables in Hong Kong and Taiwan: 1990 – 2009

	HK GDPG	HK BDG	HK BLG	HK CUSG	HK CULG	HK SDR	HK BLR	HK CPIG	TW GDPG	TW BDG	TW BLG	TW CUSG	TW CULG	TW SDR	TW BLR	TW CPIG
HKGDPG	1.0000															
HKBDG	0.6635	1.0000														
HKBLG	0.9189	0.6268	1.0000													
HKCUSG	(0.1916)	(-0.0190)	(0.1156)	1.0000												
HKCULG	0.7068	0.5948	0.6593	(0.0756)	1.0000											
HKSDR	(0.3528)	(0.3903)	(0.2947)	(-0.2226)	(0.4564)	1.0000										
HKBLR	(0.2965)	(0.4666)	(0.2442)	(-0.2265)	(0.4604)	0.9005	1.0000									
HKCPIG	0.8021	0.7020	0.7884	(0.1376)	0.8767	(0.4543)	(0.4148)	1.0000								
TWGDPG	0.7076	0.6659	0.5852	(0.2297)	0.6428	0.6329	0.5699	0.6850	1.0000							
TWBDG	0.6794	(0.4869)	(0.5048)	(0.2148)	0.6988	(0.4819)	(0.2981)	0.7478	0.6973	1.0000						
TWBLG	0.7765	(0.4827)	0.6085	(0.2442)	0.6585	(0.4183)	(0.2644)	0.7405	0.7737	0.9235	1.0000					
TWCUSG	0.7676	0.5834	0.6313	(0.2668)	0.8009	(0.5228)	(0.3935)	0.8411	0.8291	0.8950	0.8741	1.0000				
TWCULG	0.7917	0.6396	0.6364	(0.2097)	0.8072	(0.4656)	(0.3918)	0.8605	0.7570	0.8362	0.8132	0.9311	1.0000			
TWSDR	0.6667	0.6216	(0.5466)	(0.1033)	0.7608	0.8038	(0.7371)	0.7658	0.8535	0.7826	0.7219	0.8954	0.8374	1.0000		
TWBLR	(0.4058)	(0.3166)	(0.2773)	(0.1508)	(0.5428)	0.7864	0.7226	0.5000	0.6653	0.5748	(0.4537)	0.7114	0.6439	0.8806	1.0000	
TWCPIG	0.7066	0.6997	0.6447	(0.1908)	0.6512	(0.3779)	(0.4180)	0.7592	0.7696	0.5646	0.6320	0.6995	0.8071	0.7005	(0.4503)	1.0000

Note: Figures in parentheses are those correlation coefficients with values less than 0.5615 which indicate there is no evidence of a statistically significant association between the corresponding pair of random variables at a significance level of 1% (or a confidence level of 99%).

As demonstrated in Table 5, the following are some interesting findings about credit union savings and loans in Hong Kong and Taiwan:

1) The figures with a shaded background in the Table indicating that the annual growth rate of credit union savings in Taiwan (TWCUSG) were highly correlated (r=0.93) with its annual growth rate of credit union loans (TWCUSG); but in Hong Kong, the annual growth rate of credit union savings (HKCUSG) did not have significant relationship (r=0.08) with the annual growth rate of credit union loans (HKCUSG). This may be explained by the liquidity of credit union savings and the result of the practice of regular saving. Since credit union members in Hong Kong are allowed (with the approval from the board of directors) to transfer or withdraw of a part of their shares but credit union members in Taiwan are only allowed to withdraw the whole of their shares, we can say that credit union savings in Hong Kong has the benefit of high liquidly but cannot enforce regular saving, but the situation in Taiwan was reversed. That is, while credit union members in Taiwan were able to facilitate the contingency payments only by adjusting their periodic savings, credit union members in Hong Kong were able to adjust their share balances as well as the periodic savings. According to the principle of alternative choice, when credit union members need money for contingency payments, they will make the payment by a combination of reducing their savings and receiving loans from their credit unions (i.e. to reduce the amount of savings at the credit union that earns a lower interest rate, and reduce the amount of borrowing from the credit union that requires a higher interest rate). So that credit union savings in Hong Kong was performing the function as a precautionary balance and making the annual growth rate of credit union savings in Hong Kong (HKCUSG) move independently with the aggregate economic environment.

2) The figures with a shaded background in the Table indicating a significant relationship (r=0.81) between the annual growth rate of credit union loans in Hong Kong (HKCUSG) and the annual growth rate of credit union loans in Taiwan (TWCUSG). And, in turn, they are highly correlated with their economic growth rates (HKGDPG / TWGDPG) and consumer inflation rates (HKCPIG / TWCPIG). It

reveals the fact that credit union members in these two regions tended to borrow more from the credit union in times of economic prosperity and high inflation, because they have stronger desire to improve their living standards which backed by higher income expectation and the low (or even negative) real interest rate[8] is beneficial to them; but during economic downturns, they tend to borrow less because they expect a lower income in the future and face a higher real interest rate.

3) The annual growth rate of credit union savings in Taiwan (TWCUSG) was significantly correlated with the annual growth rate of credit union loans (TWCUSG), bank deposits growth rate (TWBDG), bank loans growth rate (TWBLG) economic growth rate (TWGDPG) and consumer inflation rates (TWCPIG). However, the annual growth rate of credit union savings (HKCUSG) did not have significant relationship with all other listed variables.

4) Because of the financial globalization, the level of interest rates in Hong Kong and Taiwan were significantly correlated (the correlation coefficient ranges from 0.72 to 0.8). In Taiwan, both the annual growth rate of credit union savings and loans were significantly correlated with the interest rate level; in Hong Kong, however, neither the annual growth rate of credit union savings nor the annual growth rate of credit union loans was significantly correlated with the interest rate level. The reasons behind this diffidence could be very complicated: it may be due to the rigidity of Hong Kong credit union dividend rates and lending rates, the linked exchange rate system[9] which makes Hong Kong's market interest rate cannot reflect the local aggregate economic environment, or the precautionary nature of the Hong Kong credit union savings balances (Poon and Ma, 2006; p.44 & p.67).

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[8] Since the maximum annual lending rate is fixed at 12.68% (1% per month), a higher inflation rate implies a lower real interest rate.

[9] Hong Kong follows a linked exchange rate system for its currency Hong Kong Dollar (HKD) with United States Dollar (USD) at 7.8 ($7.8 HKD = $1 USD); actually Hong Kong now allows its currency to float between an upper (7.85) and lower (7.75) limit.

5. The Loan-to-Savings Ratios

Having discussed the correlation of credit union savings and loans between the selected major macroeconomic variables from the 1990-2009 data, we can now analyze the similarities and differences of savings and loans between credit unions and banks. Tables 1 and 4 contain some important descriptive statistics that feature the characteristics of the savings and borrowing behavior of credit union members and bank clients. Firstly, the mean growth rates in credit union savings in Hong Kong (HKCUSG) and loans (HKCULG) were higher than the mean growth rates in bank deposits (HKBDG) and bank loans (HKBLG); but in Taiwan, the situation was reversed. This demonstrates that the credit union industry in Hong Kong will have a better business competitive edge in the local financial sector than that in Taiwan.

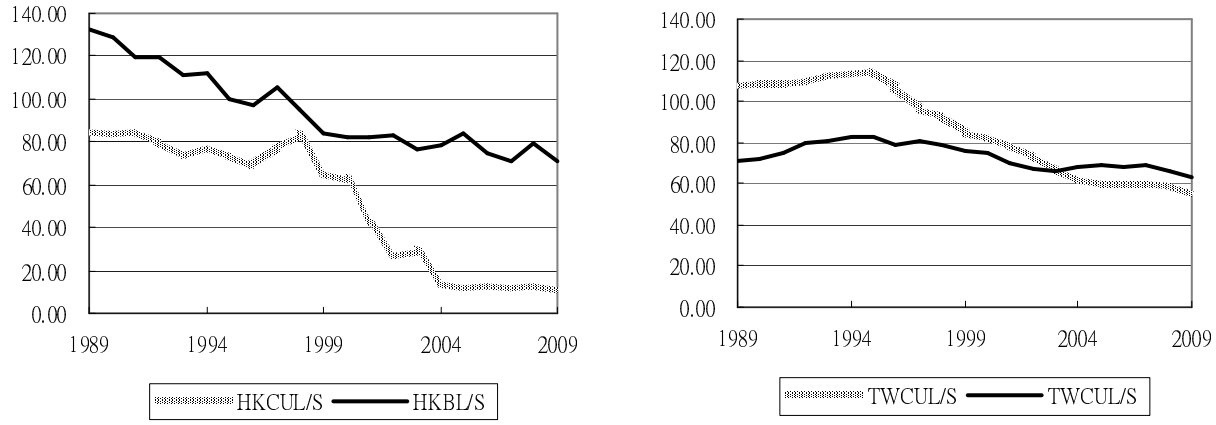
Secondly, Regarding outstanding loan balances, it is interesting to note that the credit union loans in Hong Kong have registered a higher growth rate than the bank loans in times of economic prosperity from 1989 to 1999; however, during the period 1999-2009 when the economy of Hong Kong was in recession because of the East Asian Financial Crisis 1998, the performance of credit union loans was actually worse than that in the banking sector. Although the situation in Taiwan has not been as significant as that recorded in Hong Kong, the similar characteristics can also be observed. This is because most of the credit unions have fixed their maximum lending rate at 1% per month. However, when the level of bank lending rates had to be adjusted upward during economic upturns, it made the cost of borrowing from credit unions lower than that from banks, and therefore made the growth rate in credit union loans much higher than bank loans. When a lower level of bank rates prevailed in times of recession, the results were reversed.

Thirdly, since the average interest rate spread between credit union savings and loans

is about 6%[10] and they were 3.74% and 1.95 respectively[11] in the banking industry of Hong Kong and Taiwan over the period 1990-2009, that means if both the credit union and banking industries lent out all the savings or deposits received (we ignore the reserve holdings), the operational efficiency of the credit union industry was better then that of the banking industry. However, if we take into account the amount of the difference between bank loans and deposits on the one hand, and the difference between credit union loans and savings on the other hand, and consider the credit creation ability of banks, the operational efficiency of the credit union industry is not commensurable with that of the banking industry.

Figure 3 Time Plots of the Loan-to-Savings Ratio for Credit Unions and Banks (%)

a. Hong Kong b. Taiwan



Sources: see Table 1 and .3

Figures 3a and 3b above show a downward trend in loan-to savings ratios in both the credit union and banking industries. It is clear that the banks' loan-to-savings (deposit)

[10] There is a general practice among credit unions worldwide to charge a maximum lending rate of 1% per month (12.68% APR) and a maximum dividend rate of 6%.

[11] Over the period 1990-2009,in Hong Kong, the mean bank landing interest rate was 7.45% and the mean bank deposit rate was 3.72% (see Table 2); in Taiwan, it was 6.45% and 4.55% respectively (see Table 4).

ratio was always much higher than the credit unions' because the Banking Law allows banks to search for sources of funds other then deposits through the interbank market and the debt market. However, when the banks' loan-to-savings ratio reached its maximum in 1989 in Hong Kong and 1995 in Taiwan, it changed to a negatively sloped trend because the demand for bank loans became stagnant as a result of the keen competition in the loan markets both domestically and internationally. In addition, the fact that people found no profitable investment opportunities in the financial markets during recession and would rather hold their speculative balance in the form of deposits with banks, created a force to pull down the loan-to-savings ratio further. Judging from the fact that the time series of the loan-to-savings ratio of banks and credit unions were highly correlated (r=0.85 in Hong Kong and r=0.83 in Taiwan), we can conclude that credit unions and banks are facing the problem of how to transmit their savings (deposits) liability to earning assets (loans) in times of recession. Because loans are the most profitable and least risky earning asset to banks and credit unions, bankers and credit union directors have to pay more attention to promoting the loan market.

6. Concluding remarks

The fundamental motivation of a credit union is to provide financial services for its members as a depository for savings and an access to micro credit. Croteau pointed out in his book (1963, p.7) that "The credit union, unlike the business firm, should not necessarily strive to maximize profits, but should consider first the effect of its action upon the economic interests and social values of its member." However, we know credit unions in Hong Kong and Taiwan are facing the problem of declining loan-to-savings ratio (11.1% in Hong Kong and 55.21 in Taiwan at end of 2009), in order to survive, they are eager to earn enough money to pay for expenses and provide a reasonable dividend yield to their members (after setting aside required reserves). Taking Hong Kong's credit union industry as an example, in addition to explore new loan products in a tight lending market, they tended to allocate a significant portion of

the share balance to financial market investments (about 40% in 2009). And thus, credit unionists need to spend a lot of time and effort on financial management at the cost of ignoring the true values by which credit unions are to be in the new century and beyond.

In order to improve the economic wellbeing of the people in the weak sector of the society without sacrificing the credit union principles, we have three suggestions. Firstly, remove the ceiling of the dividend rate and the lending rate so as to enable interest rate adjustments to equalize credit union savings and loans; secondly, reconsider the loan policies and procedures in order to encourage both productive and consumption loans; and finally, implement some guiding principles for the determination of lending interest rates and dividend rates so that the borrowers are not overcharged and the savers are giving a fair return.

It is worth pointing out that the credit union movement is not a panacea for the problem of any society. What credit unions can do is to mobilize the human resources of a country by giving people a method of solving their own problems, and the role that credit unions can play as democratic institutions in improving the living standards of the people in a country is a significant concern when evaluating the role and purpose of the credit union movement. We believe the Hong Kong and Taiwan credit union movements would be further developed with their members' enthusiastic support and participation.

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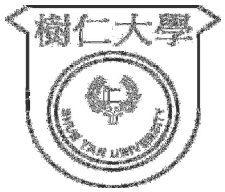

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