
**STATISTICAL ANALYSIS OF THE CHANGING
MEMBERSHIP TRENDS OF THE CHARTERED
PROPERTY CASUALTY INSURANCE (CPCU)
SOCIETY.**

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ABSTRACT:

This project focuses on analyzing the factors driving the decline in membership at the Chartered Property Casualty Underwriters Society (CPCU). Society members are offered the CPCU designation. The CPCU designation requires passing eight rigorous undergraduate- and graduate-level examinations, certain work experience requirements, and agreeing to be bound by a strict code of ethics.

In the recent past, a greater number of Universities are offering business degrees with a concentration in business and insurance. The primary objective of this project is to analyze developments in the education of insurance professionals and effects to membership trends faced by the CPCU.

There are more people pursuing insurance- related careers, most of whom are opting not to pursue the CPCU designation. The secondary objective of this study is to statistically analyze the effect these workers have on the adverse membership trends at the CPCU. More than half of the CPCU members as of June 2009 are over 50 years old (refer to graph of CPCU Members by Age in Appendix). The project will offer the effect of the retiring 'baby-boomer generation' from the work force as a possible factor counteracting this increasing number of insurance professionals from having an equivalent effect on the number of people joining the Society.

Finally, this research project statistically analyzes the relationship between the National GDP and the Society's membership. The impact of technological advancements in driving changes in underwriting volume and training of property and casualty industry sector professionals is offered as a possible factor counteracting the effect of the increasing GDP on membership trends.

I: INTRODUCTION:

Members of a society usually come together to form groups that are both mutually and individually beneficial for those involved, as well as the society at large. Such groups are formed by individuals who share a common goal. These groups include professional organizations, social clubs, and learning institutions. By coming together, the members of the group gain benefits and accomplish goals that would otherwise be difficult to attain on their own. As such, group membership is an important part of the member's life. As a member of a group, one is presented with opportunities to participate in various activities thereby, contributing to the process of achieving individual goals and group goals.

The Chartered Property Casualty Underwriters' Society (CPCU Society) is one such group. The CPCU Society (www.cpcu.org) is a community of credentialed property and casualty insurance professionals who promote excellence through ethical behavior and continuing education.

Furthermore, according to the CPCU website, Underwriters, Claims Adjusters, Agents, Brokers and Risk Managers account for slightly more than half of its membership. Members have to be credentialed by the CPCU before they can attain membership. Credentialing is accomplished by passing a series of examinations offered by the Association of Chartered Property Casualty Underwriters' (AICPCU).

The CPCU Society (the "Society") was founded in 1944, and has had more than 65,000 members since inception. The Society had 22,330 active members as of August 2009. Newly credentialed members have their first year membership fee waived upon completion of relevant CPCU examinations. Subsequent to the first year, annual membership is payable either by the individual

or the employer. Benefits of membership include: networking opportunities with Society members, access to the Society's newsletter, the Society website, a members directory and discounts to certain industry events.

The Society has seen a decline in membership over the last decade. The decline may be attributed to changes in the market (such as technological advancements in the industry decreasing the number of professionals required to perform a task), or changes in the demographics of the population in general and the labor force in particular (such as the retirement of workers from the baby-boomer generation which constitutes more than half of the CPCU membership).

Additionally, this project report identifies the impact of the increasing number of students pursuing business-related undergraduate degrees along with the increases in general economic productivity as quantified by Gross Domestic Product. The report correlates the social and technological developments to the decreasing trend in Society membership.

II: LITERATURE REVIEW:

Membership in professional organizations and unions may enable members to accomplish goals that would otherwise be difficult to achieve on their own. One approach used to characterize benefits derived in this way is by use of a utility function. In their paper, Jones & McKenna, (1994) use a utility model to analyze the relationship between union membership and employment. They model the role played by union membership in the determination of wages and employment. Workers in an industry are able to choose to belong to a union, weighing the benefits of union membership against the costs of membership. The costs of membership include workers dues, measured in utility terms, an alternate wage and the cost of membership. Jones & McKenna conclude that membership increases when the utility of being a member exceed the utility of not being a member. They point out the different treatment accorded to union versus non- union members in company decision- making processes.

Similarly, possession of the CPCU designation may have an effect in the determination of wages for a person's position, and could also influence an employment decision in view of the fact that the designation signifies that a person has certain industry knowledge. In this case, those without the designation may be viewed as having a greater unemployment risk with the designation. One other benefit of having a designation/ union membership is longer job tenure. A company that values the designation may require that a person holds the designation in order to be considered for certain promotions and salary increases. This may also be put into consideration when giving bonuses for employees' success in the CPCU examination process, or for the final CPCU

designation. Companies may sponsor their designees by paying for their trips to the conferment ceremony, together with annual membership dues as an added benefit.

In a paper examining group membership trends for unions, Chang, Lai, & Chang, (1998) report that Union membership will grow whenever the expected utility of union membership exceeds that of not being a member.

In a study on voluntary association membership longitudinal analysis carried out on people in Nebraska, Babchuk, N. (1969) discovered that a majority of people had multiple group memberships. Group memberships are a means of reinforcing important values, and also function as vehicles to implement special personal interests. Factors that influenced group membership included the gender and the stages of the lifecycle in which the members were. Associations were also observed to be more common during the middle years of a person's life. Babchuk (1969) states that group membership can be socio-emotionally gratifying and also makes it possible for an individual to control an important part of their environment. In the study, he observed that affiliation is directly related to social class, and that people who have resided in a community for the longest period of time are more likely to be members of groups than recent migrants. Groups that people joined included job related, church, recreational, fraternal service and adult leadership of youth (such as YMCA and YWCA). Babchuk (1969) also observed that people residing in highly urban areas were more likely to be members in associations than those in rural areas. Men were also more likely to be affiliated with associations than women. In terms of age patterns, participation increased gradually, and increased more for those men ranking high in socio-economic status. Peak membership was observed to occur between the ages of 45 and 54 and dropped in the fifties, and dropped further in the sixties. Approximately 62% of the respondents maintained affiliation with job-related associations during the four year period over which the

study was carried out. Both men and women maintained affiliation with their job- related associations once they joined. Possible reasons given for women joining and maintaining memberships is that those who left the workforce and rejoined once their children grew up, they still had a connection with their industries. The study carried out by Babchuk (1969) also observed that women joined church related and recreational groups more than men. The overall study emphasized the importance placed in affiliations, since 84% of respondents stated that they belonged to one or more associations during the duration of the study.

In a study carried out about voluntary association and the effect of its location, (Glanville, 2004) states that voluntary associations provide an organized context for joint activities, and are therefore likely to shape social networks. The study continues to state that these network structures are important because voluntary associations are relevant throughout one's entire course of life. They also represent an opportunity to observe how network characteristics are determined by both choice and social structure. The study observes that geographical location and type is an important characteristic to consider because they are connected to the composition of the voluntary associations. Glanville (2004) observes that networks of high-level density (most of the members of the social network know one another) leads to less accessibility of information and resources, and that greater social network diversity enhances access to a wider social world. Ties between people who are socially different serves as valuable bridges between otherwise disconnected, homogenous social worlds. Glanville (2004) states that at the micro-level, less dense and more socially diverse networks increase access to resources such as information about good jobs, and at the macro-level, they promote greater integration and organizing potential for neighborhoods and communities. It is observed that because voluntary associations provide an

organized context for joint activities, involvement is also likely to shape social networks. In a survey of local members, 58% of the members made new friends through their involvement with the organization. People form important ties through participation in organizations. The organization facilitates regular contact between the member and the person who recruited him or her -- whether or not they were friends or knew each other before joining the organization. Membership is a powerful force for individual and societal integration. The socio- economic status of an individual is influenced by the associations and groups the person joins. Higher socio- economic status is correlated to participation in organizations and greater network diversity. Unlike neighborhood networks, external networks, for the most part, do not constrain social networks and in some cases expand them.

In a study on Declining union membership post World War II era, (Cornfield, 1986) describes the phenomenon of declining membership as the 'replenishment theory'. In his paper, he states that a rational, utility maximizing worker considers factors such as improved employment conditions, the membership dues required, and employer attitude towards the union when joining a group. It is hypothesized that people join unions more during growth periods of the business cycle, when they can afford to pay the dues. Layoffs and shutdowns of companies are reasons given for fewer people renewing their membership during subsequent years.

In commenting on a study on the trends in voluntary group membership, (Smith, 1990) observed that both individual membership in groups and groups themselves have high turnover, and that the formation and growth of certain groups is always to a greater or lesser extent offset by the decline and demise of other groups.

In a study analyzing the Structural Change in the CPCU Curriculum and Its Effect on the Completion Time, (Choudhury, Jones, Gamage, & Ostaszewski, 2008) state that this may be explained by the different educational alternatives that are now available. It may be the case that there are people who obtain Masters Degrees in Business Administration, possibly with a concentration in Insurance or Risk Management, as opposed to pursuing professional designations, such as the CPCU. According to their paper, the average age of a CPCU enrollee is 31, and this may play a role in the gender disparity observed in membership, since time spent on family care is well-documented -- women's attachment to the labor force has been more irregular than men's due to competing family responsibilities. This is supported by (Day & Newburger, 2002) in a study for the U.S. Census Bureau based on the effects of educational attainment and synthetic estimates of work- life earnings.

Decline in membership in unions may come from a change in the structure of employment. With the advancements that have been made in the technological industry that have led to automation of various roles that previously required manual labor may play a role in the changing membership that is being experienced by the CPCU. Changes in legislative framework and the government's attitude towards such associations which are seen as important determine the association's fortunes. In a study on the trade union memberships in Ireland, (Walsh & Strobl, 2009) cite instances where legislation provides employees in companies with more than fifty workers with the right to consultation over major decisions.

In a research carried out by the Association of Certified Public Accountants (AICPA), Gunz & McCutcheon (2003) observed that factors considered when acquiring a professional designation included initial wages, perception of work, fear of litigation, more attractive career opportunities in other area, and increase in audit technology which would reduce employee complements, and whether the designation is perceived as the most direct route to the desirable new designation, and is also a means of maintaining connection with spun off consulting firms.

Professional credentials have the advantage of helping employers evaluate potential employees, and may be considered as more important than the job title in some cases. It is also a standard used to evaluate professional service providers and assures clients that the can receive a broader range of services form professionals that they can trust. This designation also acts as a third party assurance of competence and ethical performance.

One reason that was considered for the declining number of CPA's during early 2000's was that there were programs offering similar qualifications, such as the Executive MBA programs.

III: Data and Methodology:

The subject of this study was the number of members of the CPCU Society from 1995-2009. This membership data was collected at the end of August of each year during the period. To be eligible for membership, one had to successfully complete a series of examinations offered by the AICPCU Organization and received the corresponding designation. Membership is renewable annually, while first year membership fee is waived for new members on successfully attaining the designation.

To explore the effect of business undergraduate degree earners on the Society's membership, data from the Bureau of Labor Statistics (www.bls.gov) about these degree earners is used. Data on the number of employees in the insurance and financial industry is obtained from the National Center for Educational Statistics (www.nces.gov). Finally, National GDP data was obtained from the Bureau of Economic Analysis (www.bea.gov).

Data used in the models was stored in an Excel Spreadsheet, and SAS was used to perform the statistical analyses.

The functional form of the regression models used is:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \varepsilon_i \quad i=1, \dots, n.$$

Where y is dependent variable (number of CPCU members, in this case), x_i 's represent the independent variables, β_i 's represent the coefficients attached to the independent variables, and ε_i represents the error term in the regression model.

The hypotheses to be tested are:

Regression model (1):

The number of people earning degrees in business related fields doesn't have an effect on the number of members in the CPCU against the alternative hypothesis that it does, i.e.:

$$H_0: \beta_1 = 0 \text{ vs. } H_1: \beta_1 \neq 0.$$

and

$$H_0: \beta_2 = 0 \text{ vs. } H_1: \beta_2 \neq 0.$$

Regression model (2):

The null hypothesis that The National GDP does not have an effect on the number of members in the CPCU against the alternative hypothesis that it does, i.e.:

$$H_0: \beta_1 = 0 \text{ vs. } H_1: \beta_1 \neq 0.$$

and

$$H_0: \beta_2 = 0 \text{ vs. } H_1: \beta_2 \neq 0.$$

All tests are carried out at the .05 level of significance.

IV: Empirical Results:

The distribution of CPCU membership from 1995-2009 is presented in Graph 1 in the Appendix.

The graph indicates that there is an overall decrease in the Society's membership during this period.

A graphical analysis of the number of CPCU designees indicates that there is an overall decline as the number of employees in the insurance and financial sectors increases during the same period.

Regression analyses were carried out to analyze these observations statistically in the first regression model.

The graphical analysis of the number of CPCU's against the productivity in the economy as quantified by the National GDP shows that CPCU membership is declining as the productivity in the economy is increasing between 1995 and 2009. This observation shall be analyzed statistically in the second regression model.

The summary statistics for the variables being used are presented in the Descriptive Statistics Table in the Appendix. The CPCU Society had an average of 24,694 members during the period with a standard deviation of approximately 1887 members. The average number of people employed in the financial and insurance industry during the period was 7,741,270, with a standard deviation of approximately 46,172. The Average National GDP during the period in focus is \$10.947 trillion with a standard deviation of approximately \$2.374 trillion.

The results of the regression analyses are presented below.

Regression Model (1):

The results of performing a regression of the Society's members against the number of business degree earners and the number of employees in the Financial and Insurance Industry yielded the model below:

$$y = 22054 - 0.056077x_1 + 1.93154x_2 + \varepsilon_i$$

Where:

y: total CPCU members

x_1 : Business Degree Earners

x_2 : Industry Employees

ε_i : Error term

Results of this regression model have been reported in the Regression Output (1) Table in the appendix. The variables in the estimated regression model are all statistically significant at the .05 level of significance with a positive intercept. 76.6% of the relationship between the dependent and independent variables is explained by the model.

This regression model implies that the null hypothesis that the number of business degree earners does not have an effect on the number of CPCU members shall not be accepted. The results of this regression model indicate that, holding other factors constant, a unit increase in the number of business degree earners causes a decrease of CPCU members by 0.056. This implies that the CPCU may be facing competition for potential members from Universities that offer business related degrees – an increase of 1000 graduates from these programs may lead to a decrease in the number of CPCUs by approximately 56 members.

The CPCU may also face the declining membership as a result of an aging baby boomer generation which constitutes a large proportion of the Society's members. The combination of this effect, along with the younger generations pursuing business related majors during their undergraduate studies may contribute to the declining membership.

Furthermore, it can be deduced from the regression model above that a unit increase in the number of employees in the insurance and financial sectors of economy leads to an overall increase of approximately 1932 CPCU members. The null hypothesis that the change in the number of employees in the insurance and financial industry does not have an effect on the Society's membership is therefore not accepted. This may be because more industry professionals would pursue the CPCU designation to increase their competence. The Society would therefore experience an overall increase in membership because it offers these benefits, among others, to its members.

Regression Model (2):

The results of regressing of the Society's annual total members against the number of business degree earners and National GDP yielded the model below:

$$y = 40659 - 0.10276x_1 + 1.10518x_2 + \varepsilon_i$$

Where:

y: total CPCU members

x_1 : Business Degree Earners

x_2 : National GDP

ε_1 : Error term

Detailed results of this regression model have been reported in the Regression Output (2) Table in the Appendix.

The independent variables in the model are both significant at the .05 level, and 84.31% of the relationship between the dependent and independent variables is explained by the model.

The null hypothesis that an increase in Business degree earners has no effect on the CPCU membership is once again not accepted, and the alternative hypothesis is accepted. The regression model indicates that a unit increase in the number of business degree earners causes a decrease in the number CPCU members. Specifically, an increase of 1000 business degree earners leads to a decrease of about 103 CPCU members.

The null hypothesis that an increase in GDP has no effect on CPCU membership shall therefore not be accepted in favor of the alternative hypothesis that it has an effect. This implies that, holding other factors constant, a unit increase in National GDP is expected to reflect an increase in the number of CPCU members by approximately 1 member. This may be because increased economic productivity leads to an increase in the amount of business to be underwritten, thus requiring more underwriters and insurance professionals, and -- as a result -- CPCU designees.

V: Conclusion:

The findings of this research suggest that competition from business-related Undergraduate degree programs may be causing a decrease in the number of people pursuing the CPCU designation. On the other hand, the increasing productivity of the economy may lead to an increase in the amount of business that needs to be underwritten in the Property & Casualty industries, necessitating the need for qualified professionals to perform these duties.

Another factor that may be causing the declining membership is the pipeline effect of the baby-boomer generation -- which constitutes a large proportion of the membership -- retiring from the labor force.

The second analysis indicates that an increase in the National GDP leads to an increase in the number of CPCU members. One possible factor that may counteract this effect could be the declining labor force participation by the baby boomer generation that accounts for more than half of the Society's membership as of June 2009. This increase in their retirement could be reflected in the decrease in the Society's membership since members may opt not to renew their memberships once they exit the workforce. This could be a possible area for further research.

The increase in employees within the Financial and Insurance sector and the National GDP correspond to an increase in the Society's membership. Technological advances may counteract these increasing numbers. An increase in the use of technology in the industry may require more training for industry professionals, but require fewer professionals due to the automation of activities that previously required CPCUs. The effect of such technological advances on membership could be a possible area for further research.

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Appendices:

i : Definition of Variables:

- Total Members: Total CPCU members during each period
- Employees in Industry(‘000): Number of people employed in the Financial and Insurance Sector of the US economy
- Bachelors Degree Earners: Number of people earning Bachelor’s Degrees during the year
- Gross Domestic Product(Billions of Dollars): USA Gross Domestic Product

ii: Descriptive Statistics of Key Variables:

Variable	Mean	Standard Deviation	Minimum	Maximum
Total members	24694.93	1887.42	22013.00	27518.00
Employees in Financial Industry (‘000)	7741.27	461.7275738	6827.00	8328.00
Business Degree earners (Undergraduate)	273099.07	39336.87	225934.00	335254.00
National GDP(‘000,000)	10947.31	2374.06	7414.70	14369.10

iii: Regression Output:

Regression Model (1):

Dependent Variable: Total Members.

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	38203231	19101615	19.64	0.0002
Error	12	11669970	972498		
Corrected Total	14	49873201			

Root MSE	986.15288	R-Square	0.7660
Dependent Mean	24695	Adjusted R-Square	0.7270
Coefficient of Variation	3.99334		

Variable	Degrees of Freedom	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	25054	4939.09143	5.07	0.0003
Business Degree	1	-0.05607	0.01004	-5.58	0.0001
Industry employees	1	1.93154	0.85567	2.26	0.0434

Regression Model (2):

Dependent Variable: Total Members.

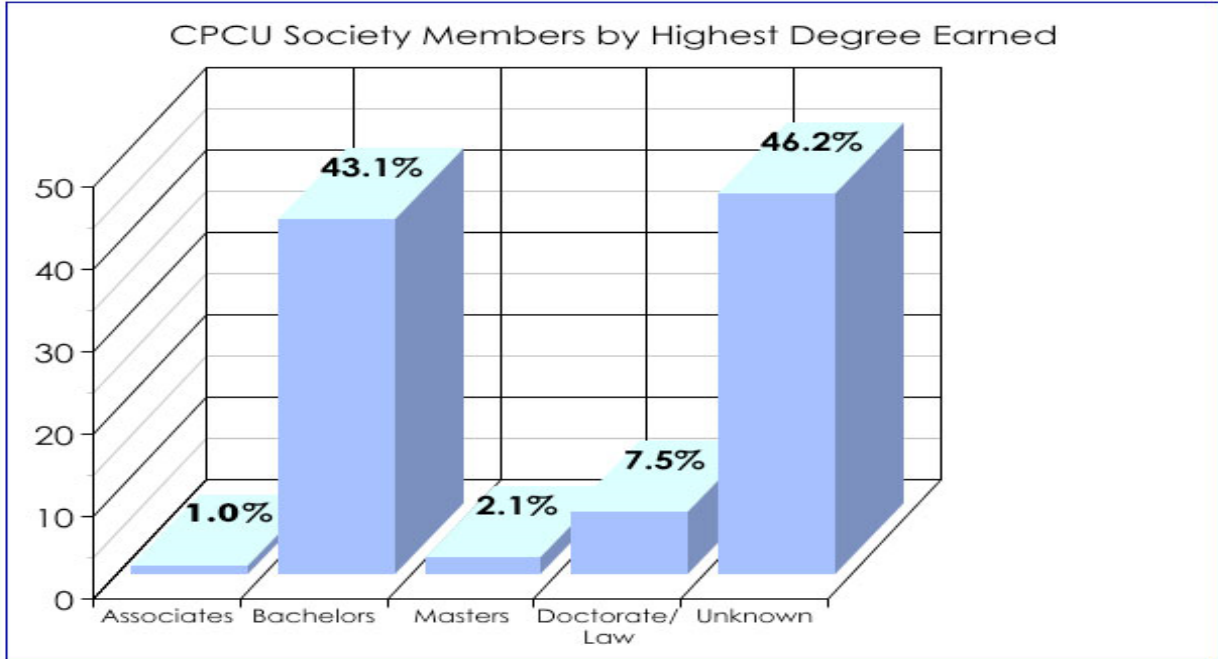
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	42048423	21024211	32.24	<.0001
Error	12	7824778	652065		
Corrected Total	14	49873201			

Root MSE	807.50532	R-Square	0.8431
Dependent Mean	24695	Adjusted R-Square	0.8170
Coefficient of Variation	3.26992		

Variable	Degrees of Freedom	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	40659	2083.87601	19.51	<.0001
Business Degree	1	-0.10276	0.01816	-5.66	0.0001
National GDP	1	1.10518	0.30083	3.67	0.0032

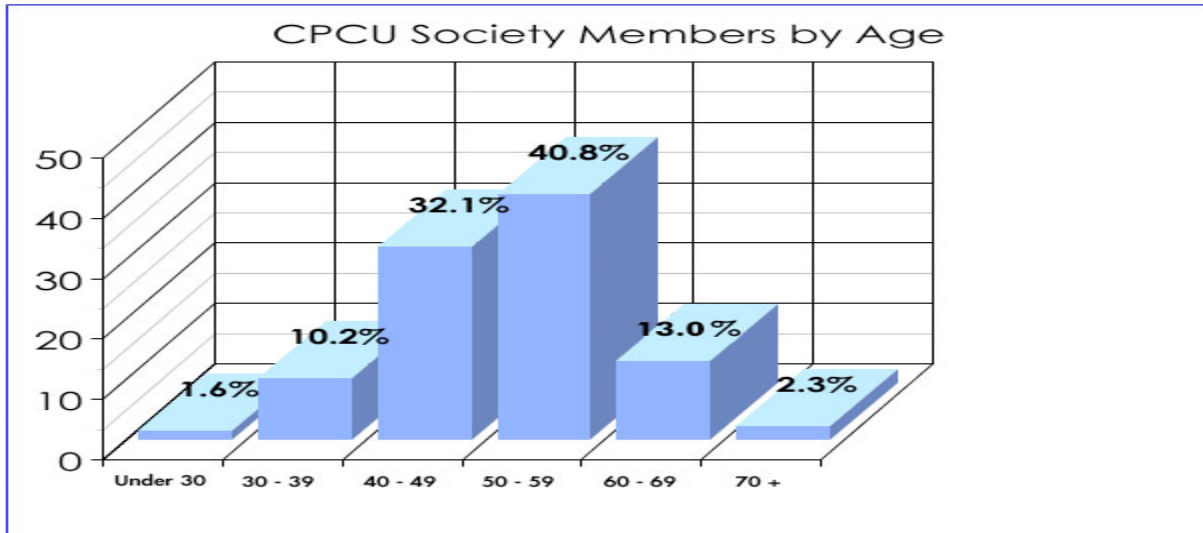
iv: Graphs:

CPCU Society Members by Highest Degree earned as of June 2009:



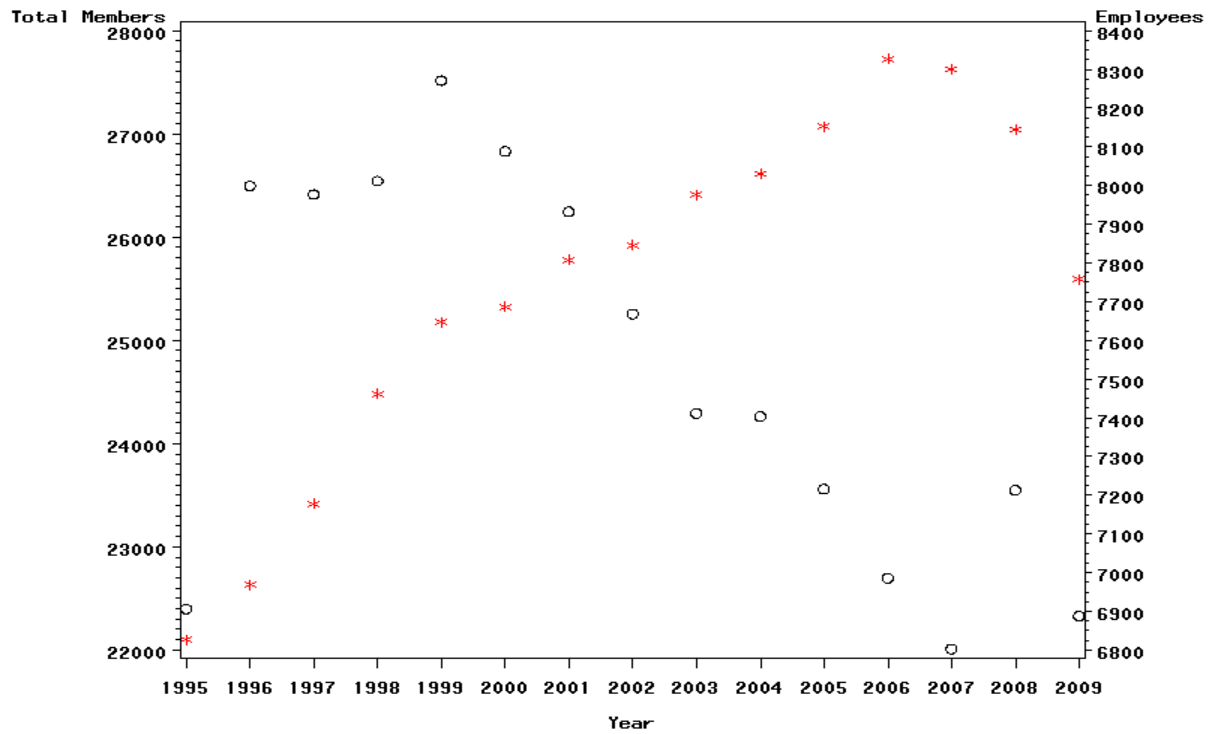
Source: <http://www.cpcusociety.org/index.v3page?p=46310>

CPCU Society Members by Age as of June 2009:

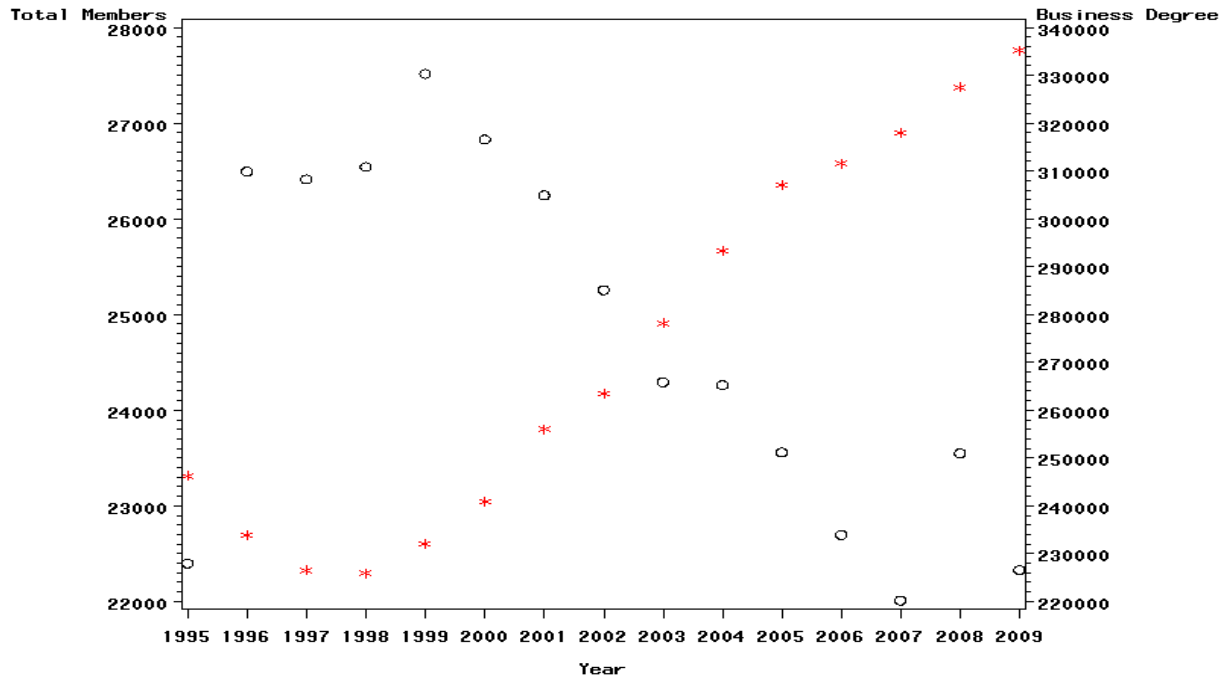


Source: <http://www.cpcusociety.org/index.v3page?p=46311>

CPCU Membership and National Employees in the Insurance & Financial Industry



CPCU Membership and Undergraduate Business Degree Earners



CPCU Membership and National GDP

