

Bonus ratio, individual performance, and Self-selection of housing brokerage employees

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ABSTRACT

This study explored the Self-selection issues present in the individual bonus ratio and individual performance of housing brokerage employees. The participants in the survey were housing brokerage employees in Kaohsiung City, Taiwan. In this study, individual performance and individual bonus ratio were designated as interacting endogenous variables. Evaluations were conducted using two-phase simultaneous equations. The empirical results showed the following: 1. a higher bonus ratio resulted in better individual performance, while better individual performance resulted in a higher bonus ratio. 2. Male workers performed significantly poorer than female workers. 3. Junior college education, hours of work, and low salary had a significant positive effect on individual performance. 4. Significantly more men than women selected brokerage work with a high individual bonus ratio. 5. Employees with university or higher education, low salary, and working in the direct selling system had significantly lower individual bonus ratios.

Contribution/ Originality

This study explored the Self-selection issues present in the individual bonus ratio and individual performance of housing brokerage employees. In this study, individual performance and individual bonus ratio were designated as interacting endogenous variables. The empirical results showed that a higher bonus ratio resulted in better individual performance, while better individual performance resulted in a higher bonus ratio.

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1. INTRODUCTION

The main types of housing brokerages in modern Taiwan include direct selling and franchising brokerages. Sinyi Realty is the largest direct selling brokerage in Taiwan. Major franchising companies include Yungching Realty Group, Century 21, HB Housing, and Chinatrust Real Estate. The difference between the two systems is in the salary structures of real estate brokerage employees, which includes individual bonus ratio size, base salary, and group bonus. To a certain extent, the difference in salary structures is a key factor which influences real estate brokerage employees' decision to select the direct selling or franchising system.

Lee (2002) described the link between the salary and bonus system and performance in the housing brokerage industry and distinguished three types of salary and bonus systems, namely, the general, moderate-commission, and high-commission systems. 1. General: The structure of salary consists of a high base salary and low performance bonus ratio. The achievement bonus received by employees of brokerages with such a system ranges between 8% and 14%, while their base salary is approximately NT\$25,000. Currently, this system is mainly used in direct-selling housing brokerages. 2. High-commission: This system is opposite to the general system as the structure of salary is fully composed of the performance bonus ratio. Normally, base salary is not included, and the performance bonus ranges from 40% to 80%. 3. Moderate-commission: The structure of salary consists of a low base salary and a high performance bonus ratio. The performance bonus ranges between 10% and 45%, and the base salary is approximately NT\$12,000.

With regard to bonus ratio and individual performance, a higher bonus ratio normally leads to better individual performance since individual efforts are reciprocated via high bonuses. In other words, individual performance varies depending on the bonus and salary system. Lee (2002) examined the performance and remuneration systems applied in the housing brokerage industry, academic circles, and governmental institutions and found that most companies and stores utilize fixed salary remuneration systems. A performance bonus system has also been implemented for government employees, who are considered to have secure employment. Chen (2008) suggested that a good remuneration system encourages employees to work hard for their managers and company and improve their individual performance; it is a basis for labor-management relations. In other words, formulation of the remuneration system is closely related to individual performance. Lee and You (2007) indicated that individual performance in the direct selling system with a good remuneration system is better than that in franchising.

Lee (2002) tested the existence of the Self-selection effect proposed by Lazear (2000). Empirical results demonstrated that in the general and secondary systems, the performance bonus ratio had a significant positive effect on brokers' performance, indicating the existence of a "incentive effect." Furthermore, brokers with more brokerage experience tended to select the high-commission system, suggesting the presence of a "Self-selection effect." The fact that people with extensive experience tended to select systems with a higher individual bonus ratio is a reflection of how people with strong performance tend to select systems that offer comparatively higher individual bonuses. Thus, an individual bonus ratio affects individual performance, which, in turn, affects the selection of the size of the individual bonus ratio.

In this study, individual performance and individual bonus ratio were designated as interacting endogenous variables. Evaluations were conducted using two-phase simultaneous equations. The link between individual bonus ratios and individual performance was analyzed. This study consists of six sections. Section 1 provides an introduction. Section 2 reviews literature related to individual bonus ratios and individual performance. Section 3 explains the establishment of the empirical model used in this study and defines the relevant variables. Section 4 describes data collection and sample statistics, including questionnaire design, sampling method, sample collection, and sample statistics. Section 5 presents the empirical results and the discussion. The last section provides the conclusions of this study and suggestions for future research.

2. LITERATURE REVIEW

This study examined the effect of salary structure on the individual performance of housing brokerage employees. Many factors may affect the individual performance of housing brokerage employees. This study divided them into factors related to employees' background conditions and factors related to the company or branch. First, background-related factors are discussed. With regard to gender, [Chuang \(1999\)](#) and [Lee and Shen \(2007\)](#) indicated that individual performance significantly differed depending on gender; in the housing brokerage industry, female employees were found to have outperformed male employees. The development of gender awareness among women in recent years resulted in the affirmation of their working abilities in the workplace, which improved their work performance. Therefore, female workers are not necessarily less efficient than male workers ([Hulin and Smith, 1964](#); [Morris and Steers, 1980](#); [Chuang, 1999](#)).

With regard to marital status, married housing brokerage employees spend less time at work due to increased family responsibilities. As a result, their performance is poorer than that of single housing brokerage employees. According to the findings reported by [Abelson *et al.* \(1990\)](#), married employees had a lower level of work efficiency than single employees. Due to the time allocated to their families and their increased family responsibilities, married employees invested less time in their work. Thus, married housing brokerage employees demonstrated a lower level of job involvement than their single colleagues, which led to their poorer performance. [Home's \(1998\)](#) empirical results indicated that having children under the age of six can affect work performance as employees are unable to pay equal attention to both work and family. [Yang \(2014\)](#) maintained that families with children have to deal with higher expenses and more responsibilities. As modern systems provide material benefits to employees with children, such employees do not necessarily perform poorer than those without children. In view of the low fertility rates in modern societies, many countries have implemented family-friendly policies. The Labor Standards Act and Gender Equality in Employment Act in Taiwan include regulations related to fertility in working women, allowing them to give consideration to both work and children. Therefore, despite their responsibility to their children, housing brokerage employees with children can still find a balance between work and family, which will enhance their performance. Hence, the performance of employees with children under six is not necessarily poorer than that of employees without children.

With regard to educational background factors, [Lee and Shen \(2007\)](#) indicated that educational level significantly affects individual performance. The efficiency of housing brokerage employees with university or higher education is higher than that of employees with general and vocational high school education. This study suggested that a higher educational level increases housing brokerage employees' sensitivity toward changes in the market and improves their understanding of customer needs. As a result, such employees are better able to locate their customers' ideal houses, which thus improves their individual performance.

With regard to the age factor, [Sirmans and Swicegood \(1997, 2000\)](#) indicated that older housing brokerage employees did not necessarily receive more remuneration than their younger colleagues; their individual performance was also not better than that of younger employees.

With regard to the number of years worked, [Lee and Shen \(2007\)](#) indicated that the number of years worked significantly affected individual performance: employees with more work experience were more familiar with the company's operations and performed better in work-related matters. [Lee and You \(2007\)](#) reported that the number of years worked had a positive effect on performance. That study's findings indicated that employees with more years of work performed better. With regard to the number of years worked squared, as the number of years worked increased, so did its effect on individual performance. However, the rate of improvement slowed as the number of years worked increased, indicating the presence of diminishing marginal returns with respect to the effect of the number of years worked on individual performance ([Chang, 2013](#)).

With regard to working hours, as housing brokerage employees are service providers, longer working hours indicate a greater number of customers who need their services; thus, housing brokerage employees who work more hours perform better than those who work fewer hours. Yu (2001) indicated that job involvement is significantly correlated with work performance. Higher individual job involvement results in better work performance. Thus, individuals working longer hours demonstrate better work performance. Sirmans and Turnbull (1997) indicated that real estate brokers working longer hours receive higher remuneration.

With regard to brokerage work experience, the empirical findings reported by Lin (2010) indicated that more diverse work experience improves individual performance. Chu and Tong (2009) found that employees' work experience does not have any significant effect on individual performance in her or his field; longer work experience does not improve individual performance.

With regard to the company/branch factor, the tournament theory proposed by Lazear and Rosen (1981) suggested that under the incentive effect and Self-selection effect, the salary gap within an organization encourages individuals to invest more effort in order to receive more remuneration; this results in mutual constructive competition that stimulates individual potential and indirectly improves individual and organizational performance. Lee (2002) analyzed brokerage employees' choice of remuneration systems to test for the presence of the Self-selection effect proposed by Lazear (2000). The empirical results showed that under the general and moderate-commission systems, a performance bonus ratio had a significant positive effect on brokers' performance, revealing the presence of the incentive effect. Furthermore, brokers with more experience tended to choose the high-commission system, indicating the presence of the Self-selection effect.

The salary/bonus ratio and group bonus are normally considered to be related to individual performance. Chen's (2008) study found that the remuneration system significantly affects work performance. With regard to base salary, Yu and Liu (2003) indicated that under the base salary system, brokers worked significantly more hours, which meant that base salary had a positive effect on their work incentive. Furthermore, Ghaffari *et al.* (2017) suggested that an increase in salary will significantly and positively affect employees' work performance. With regard to the individual bonus ratio, Chin's (2010) study, which involved housing brokers as its participants, explored the relationship between performance bonus and work performance and determined whether performance bonus indirectly affected work performance via work motivation. The results of the study indicated that the performance bonus had a significant positive effect on performance. With regard to the group bonus factor, housing brokers may cooperate to benefit from mutual discussions as they may each have different sales skills. Fei and Yapeng (2010) indicated that housing brokerage employees' individual skills were limited and that working alone would lead only to partial success in the competitive housing brokerage market. Cooperation may increase mutual understanding in the group, and the use of the group bonus system as a form of incentive may improve the objective evaluation of brokerage employees' contributions. Group bonuses increase group cooperation and reduce disagreements between employees, creating a harmonious working environment. As a result, the performance of housing brokerage employees will improve.

With regard to salary structure, a higher individual bonus ratio positively affects the performance of housing brokerage employees. Zameer *et al.* (2014) and Hettiarachchi (2014) suggested that bonuses may motivate employees and improve their performance. Employees with better individual performance will select systems that allow them to gain a higher individual bonus ratio (Lee, 2002). Thus, any discussion regarding the effect of salary structures on individual performance must consider the individual bonus ratio as an endogenous variable. Housing brokerage employees with better performance will choose a high-commission system with a higher individual bonus ratio. The endogenous variables in this study included individual performance and individual bonus system. Simultaneous equations were used in evaluations.

With regard to performance requirements, those who are subjected to them demonstrate better individual performance than those who are not. As people tend to be passive, those with performance requirements normally perform better. Shi (2001) indicated that human resources have become increasingly important in the eyes of many people. With the development of human resource studies, it has been discovered that employees achieve better performance and output when they are subjected to performance requirements. Finally, the type of management determines the direction of a company’s development. For example, direct-selling companies tend to support high base salary structures, which is a favorable choice for new employees. In franchising, a high bonus ratio is preferred, which better suits sellers who are more familiar with the business. Lee and You (2007) indicated that individual performance under the direct-selling system is better than that in franchising because the former has a salary structure that is more sound, as well as favorable rules of promotion, which allow for the promotion of employees to improve their individual performance.

3. EMPIRICAL MODEL ESTABLISHMENT AND VARIABLE DEFINITION EXPLANATION

3.1. Empirical model establishment

Individual performance (Y) was set as a dependent variable in this study. The independent variables affecting individual performance included the individual bonus ratio (IRATE), gender (SEX), marital status (MAR), having children under six (CHILD), university and higher education (EDUU), junior college education (EDUC), work experience (EXP), work experience squared (EXPS), hours of work (HOURS), work experience not related to brokerage (WORKO), brokerage work experience (WORKB), base salary (SALA), group bonus (BONUS), performance requirements (REQU), and type of management (TYPE). An individual bonus ratio could affect individual performance, while individual performance could affect the size of an individual bonus ratio. Hence, individual performance and individual bonus ratio were endogenous variables. Two-phase simultaneous equations were used in evaluations in this study. Individual performance was derived using formula (1). (See Table 1 for variable details)

$$Y = \beta_0 + \beta_1 IRATE + \beta_2 SEX + \beta_3 MAR + \beta_4 CHILD + \beta_5 EDUU + \beta_6 EDUC + \beta_7 EXP + \beta_8 EXPS + \beta_9 HOURS + \beta_{10} WORKO + \beta_{11} WORKB + \beta_{12} SALA + \beta_{13} BONUS + \beta_{14} REQU + \beta_{15} TYPE + e \quad \dots\dots (1)$$

where β_0 is the intercept, $\beta_1 \sim \beta_{15}$ are the coefficients of independent variables, e is the error term.

The independent variables affecting the individual bonus ratio (IRATE) included individual performance (Y), gender (SEX), marital status (MAR), having children under six (CHILD), university and higher education (EDUU), junior college education (EDUC), hours of work (HOURS), work experience not related to brokerage (WORKO), brokerage work experience (WORKB), base salary (SALA), group bonus (BONUS), performance requirements (REQU), and type of management (TYPE). The corresponding model is shown in formula (2).

$$IRATE = \alpha_0 + \alpha_1 Y + \alpha_2 SEX + \alpha_3 MAR + \alpha_4 CHILD + \alpha_5 EDUU + \alpha_6 EDUC + \alpha_7 HOURS + \alpha_8 WORKO + \alpha_9 WORKB + \alpha_{10} SALA + \alpha_{11} BOUNS + \alpha_{12} REQU + \alpha_{13} TYPE + \varepsilon \quad \dots\dots (2)$$

where α_0 is the intercept, $\alpha_1 \sim \alpha_{13}$ are coefficients of independent variables, and ε is the error term.

3.2. Variable definition explanation

The independent variable “individual performance” refers to a natural logarithm derived from the average monthly achievement bonus in the last three months. With regard to gender, when recruiting new employees, modern housing brokerages often prioritize male applicants, implying that men have

a better working ability and performance than women (e.g. [Sirmans and Swicegood, 1997](#)). The findings reported by [Lee \(2003\)](#) indicated that women had lower income than men. Some studies have suggested, however, that female workers perform better than male workers. With changes in the social structure, women and men have more equality in the workplace. Women have been keeping pace with men in terms of their work and learning ability ([Chuang, 1999](#); [Lee and Shen, 2007](#)). Therefore, female workers' efficiency is not lower than that of men. Gender in this study was set as a dummy variable, with 1 indicating men and 0 indicating women. The predicted gender coefficient was indeterminate.

With regard to marital status, the results of a study by [Abelson et al. \(1990\)](#) indicated that, due to the amount of time allocated to their families and their increased family responsibilities, married workers are expected to have a poorer performance than single workers. In this study, marital status was set as a dummy variable, with 1 indicating married participants and 0 indicating single participants. The marital status coefficient was expected to be negative.

With regard to workers with children under six, the empirical findings reported by [Home \(1998\)](#) indicated that parents with children under six years old may have poorer working performance due to their failure to balance family and work. [Yang \(2014\)](#) indicated that, as modern systems provide material benefits to workers with children, these workers do not necessarily perform poorer than those without children. Modern society allows working women with children to balance both work and children, thus improving their performance. The predicted coefficient of having children under six in this study was indeterminate.

Educational level represents investment in human capital. A higher educational level represents the accumulation of more professional knowledge. Therefore, it was predicted that a higher educational level would lead to better performance. Educational levels included general and vocational high school, junior college, university, and graduate institute or higher. University and graduate institute education were combined into one category. Participants with general and vocational high school education served as the reference basis. Two dummy variables were established. Participants with junior college education (EDUC) were indicated as 1, while other participants were indicated as 0. Participants with university education (EDUU) were indicated as 1, while other participants were indicated as 0. [Lee \(1999, 2000, 2003\)](#), [Lee and Shen \(2007\)](#), and [Benjamin et al. \(2007\)](#) reported that school education had a significant positive effect on income. The empirical findings of [Shooshtarian et al. \(2013\)](#) indicated that employees with a higher educational level demonstrated better working performance. This study predicted that the educational level coefficient had a positive value. A longer education was expected to result in better individual performance.

With regard to age, [Sirmans and Swicegood \(1997, 2000\)](#) and [Lee and Shen \(2007\)](#) indicated that age did not significantly affect individual performance. A potential reason for this is that, although younger workers had less work experience and interpersonal relations than their older colleagues, most of them had professional academic backgrounds and mature thinking due to the popularization of education. Therefore, their performance was not necessarily poorer than that of their older colleagues. The predicted age coefficient in this study was indeterminate.

With regard to work-related variables, [Lee \(1999, 2000, 2003\)](#), [Lee and Shen \(2007\)](#), and [Lee and You \(2007\)](#) maintained that more years of work indicated a more extensive experience and more extensive connections, resulting in better individual performance. This study predicted that the work experience coefficient was a positive value. With regard to years of work squared, with longer work experience, individual performance improved; however, the extent of this effect waned as the length of one's work experience became longer. This indicated the presence of diminishing marginal returns with regard to the effect of years of work on individual performance ([Chang, 2013](#)). This study predicted that the work experience squared coefficient was a negative value.

Drawing upon past studies, hours of work were defined as the average amount of working hours per day in the previous three months. Longer hours of work indicate a higher investment of effort into work, which means better individual performance. [Sirmans and Turnbull \(1997\)](#), [Yu \(2001\)](#), [Lee and Shen \(2007\)](#), and [Lee et al. \(2015\)](#) indicated that longer hours of work led to higher income and better performance. This study predicted that the hours of work coefficient was a positive value.

With regard to work experience not related to brokerage, [Lin \(2010\)](#) indicated that more diverse work experience improved individual performance. This study predicted that the non-brokerage work experience coefficient was a positive value.

With regard to the brokerage experience factor, the empirical findings of [Shooshtarian et al. \(2013\)](#) indicated that employees with more work experience were more successful at work and may have applied better working methods. More work experience is related to better work performance ([Oyewole and Popoola, 2013](#)). However, according to [Chu and Tong \(2009\)](#), employees' work experience did not have any significant influence on their professional and individual performance. Workers with more work experience may have assumed that they would perform better as they can rely on their past connections and thus invested less into their work, which in turn led to their performance not being any better. In this study, the predicted brokerage work experience coefficient was indeterminate.

With regard to base salary, the empirical results in the studies by [Yu and Liu \(2003\)](#) and [Lee and Lee \(2014\)](#) indicated that under the base salary system, brokers worked significantly more hours, meaning that base salary positively affected the work incentives in individuals. In this study, base salary was set as a dummy variable, with 1 indicating the presence of base salary and 0 indicating absence of base salary. The base salary coefficient was predicted to be a positive value.

With regard to individual bonus ratio, [Lee \(2002\)](#), [Chen \(2008\)](#), [Chin \(2010\)](#), [Chen \(2010\)](#), [Wu \(2012\)](#), and [Wang \(2014\)](#) indicated that salary gaps between different levels within one organization motivated individuals to work harder toward a higher level and, consequently, improved organizational performance. In this study, the individual bonus ratio coefficient was predicted to be a positive value.

With regard to group bonus, [Fei and Yapeng \(2010\)](#) indicated that housing brokerage employees' individual skills were limited and that working alone would lead only to partial success in the competitive housing brokerage market. On the other hand, cooperation may increase a group's collective strengths. Improving a group's bonus system can improve the objective evaluation of brokerage employees' contributions. Group bonuses increase group cooperation and reduce disagreement between employees, creating a harmonious working environment and improving work efficiency. In this study, group bonus was set as a dummy variable, with 1 indicating participants who receive group bonuses and 0 indicating those who do not. The group bonus coefficient in this study was predicted to be a positive value.

With regard to performance requirements, [Shi \(2001\)](#) indicated a growing attention toward human resources. With the development of human resource studies, it has been discovered that employees achieve better performance and output when they are subjected to performance requirements. Employees with performance requirements demonstrate better individual performance than those without performance requirements. In this study, the work requirement coefficient was predicted to be a positive value.

With regard to the type of management, [Peng and Lee \(2002\)](#) found that the turnover in direct selling was greater than that in franchising. [Lee and You \(2007\)](#) indicated that housing brokerage employees in the direct selling system performed better than those in franchising. In this study, the types of management included direct selling and franchising and were set as a dummy variable, with 1

indicating direct selling and 0 indicating franchising. The management type coefficient was predicted to be a positive value. (The establishment of each variable is explained in Table 1.)

Table 1: Establishment of each variable

Variable	Explanation	Prediction code
Individual Performance (Y)	Average monthly achievement bonus in the last three months. A natural logarithm was used.	
Gender (SEX)	Gender is a dummy variable, with 1 indicating male and 0 indicating female.	+/-
Marital Status (MAR)	Marital status is set as a dummy variable, with 1 indicating married and 0 indicating single.	-
Children under Six Years Old (CHILD)	Having children under six years old is set as a dummy variable, with 1 indicating having children aged six or younger and 0 indicating not having children aged six or younger.	+/-
Educational Level (EDU)	Educational levels include general and vocational high school, junior college, and university or higher. The graduates of general and vocational high schools serve as the reference basis for the establishment of two dummy variables. When EDUC is 1, it indicates a participant with junior college education, and when it is 0, it indicates a participant whose highest level of education is not at the junior college level. When EDUU is 1, it indicates a participant with university or higher education, and when it is 0, it indicates a participant who does not have a university or higher education.	+
Age (AGE)	Age is a continuous variable measured in years.	+/-
Work Experience (EXP)	Work experience is a continuous variable referring to the number of years a participant has worked in his or her current brokerage company.	+
Work Experience Squared (EXPS)	Years of work squared.	-
Hours of Work (HOURS)	A continuous variable that refers to the average number of working hours per day in the last three months.	+
Non-brokerage Work Experience (WORKO)	Work experience not related to brokerage is set as a dummy variable, with 1 indicating participants with such experience and 0 indicating participants without such experience.	+
Brokerage Work Experience (WORKB)	Brokerage work experience is set as a dummy variable, with 1 indicating participants with such experience and 0 indicating participants without such experience.	+/-
Base pay (SALA)	Base salary is set as a dummy variable, with 1 indicating the presence of base salary and 0 indicating the absence of base salary.	+
Individual Bonus Ratio (IRATE)	The individual bonus ratio provided by a brokerage company to its employee. Continuous variable presented in %.	+
Group Bonus (BONUS)	Group bonus is set as a dummy variable, with 1 indicating a participant with group bonus and 0 indicating a participant without group bonus.	+
Performance Requirements (REQU)	Performance requirements are set as a dummy variable, with 1 indicating a participant with performance requirements and 0 indicating a participant without performance requirements.	+

Type of Management (TYPE)	Type of management includes direct selling and franchising and is set as a dummy variable, with 1 indicating direct selling and 0 indicating franchising.	+
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4. DATA COLLECTION AND SAMPLE STATISTICS

This chapter describes the study’s questionnaire design, sampling method, sample size, and sample statistics.

4.1. Questionnaire design

The questionnaire designed in this study was divided into three parts. The first part covered the participants’ basic data, which included their gender, educational level, and year of birth. The second part covered the participants’ work status, which included brokerage company type, start date of job, required working hours, and performance requirements. The third part surveyed the participants on their work history, which included their duration of work in the housing brokerage company and work experience not related to housing brokerage. Individual performance referred to the monthly average commission received in the last three months, that is, the total sale price of all transactions multiplied by the commission ratio.

4.2. Sampling method

The questionnaire in this study used the survey method to collect data. The main survey participants were employees of sales branches published on housing brokerage websites and Kaohsiung City housing brokerage companies registered on the Ministry of the Interior Department of Land Administration website. These companies included Sinyi Realty, Yungching Realty Group, Chinatrust Real Estate, HB Housing, Taichung Realty, U-Trust, ETWARM, and Century 21. A total of 1500 questionnaires were administered. The questionnaires were distributed proportionally based on the characteristics of each housing brokerage company and the number of branches that each company had. Fifteen questionnaires were distributed to each direct selling or franchising branch.

4.3. Sample size

The main participants in this study were housing brokerage companies in Kaohsiung City. The direct selling system included Sinyi Realty, while the franchising system included Chinatrust Real Estate, Century 21, HB Housing, Yungching Realty Group, U-Trust, and Taichung Realty. 10 questionnaires were administered to each direct selling and franchising branch. The survey was conducted from June to August 2015. A total of 1500 questionnaires were administered and 734 were returned. After excluding 284 ineffective and incomplete responses, 450 effective questionnaires were collected, yielding a 30% response rate.

4.4. Sample statistics

For the returned questionnaires, the average sales performance of the participants was NT\$320,000. With regard to demographic data, 62.4% of the participants were male and 37.6% were female. With regard to their marital status, 47.1% of the participants were married and 52.9% were single. With regard to family status, 72% of the brokers had children aged six or younger, while 18% did not. With regard to educational level, 1.8% of the participants had junior high school education or lower, 26.7% had general or vocational high school education, 21.6% had junior college education, 45.1% had a bachelor’s degree, and 4.7% had a master’s degree. The average age of the brokers was 40.2 years. On average, the participants had been working for 5.48 years. The average number of working hours per day among the housing brokerage employees was 9.26. 57.4% of the participants had work experience not related to brokerage work and 42.6% did not; 18.3% of the participants had brokerage-related work experience and 81.7% did not. With regard to base salary, 21.9% of the participants had base pay and 78.1% did not. The participants’ average individual bonus ratio was 45%. 69.7% of the participants had group bonuses, while 30.3% did not. 20.7% of the participants had performance requirements, while 79.3% did not. With regard to the type of management, the direct selling and franchising systems accounted for 16.7% and 83.3% of the sample, respectively.

5. ANALYSIS OF EMPIRICAL RESULTS

The empirical results in Table 2 indicated that, among factors influencing individual performance, the individual bonus ratio coefficient was 9.647, reaching the 5% significance level and indicating that a higher individual bonus ratio led to better individual performance. Lee (2002), Chen (2008), Chin (2010), Chen (2010), Wu (2012), and Wang (2014) found that individual bonuses may motivate individuals to work harder in order to get promoted, thus improving their individual performance. The empirical results in this study confirmed this theoretical expectation. The gender coefficient was -0.484, reaching the 5% significance level and indicating that the performance of male employees was poorer than that of female employees. Lee and Shen (2007) suggested that gender had a significant effect on individual performance, with female housing brokers outperforming male brokers. Due to women's growing attention toward gender equality in recent years and the development of their gender awareness and work efficiency, the performance of modern women was not poorer than that of men. The empirical results in this study corresponded to the findings reported by Lee and Shen (2007). The professional college coefficient was 0.403, reaching the 10% significance level and indicating that the individual performance of junior college graduates was significantly better than that of employees with general or vocational high school education. College education tended to be professional training. Therefore, housing brokerage employees with college education performed better than employees with general or vocational high school education. The empirical results in this study corresponded to the findings reported by Lee and Shen (2007). The coefficient related to the amount of working hours was 0.100, reaching the 5% significance level and indicating that longer working hours resulted in better individual performance. According to the studies discussed above, longer working hours per week led to higher income and better performance (Sirmans and Swicegood, 1997; Abelson *et al.*, 1990; Lee, 1999, 2000). The empirical results in this study showed that longer working hours resulted in better individual performance. The longer average working hours per day indicated that a greater level of effort was invested into work and, thus, better individual performance was achieved. The empirical results confirmed the expectations in this study and corresponded to research findings of Sirmans and Swicegood (1997), Abelson *et al.* (1990); and Lee (1999, 2000). The base pay coefficient was 1.816, reaching the 5% significance level and indicating that employees with base salaries had significantly better individual performance than those without base salaries. As reported in past studies, the base salary system is associated with significantly more working hours, indicating its positive effect on individuals' work incentive (Yu and Liu, 2003; Lee and Lee, 2014). The empirical results in this study corresponded to those reported by Yu and Liu (2003) and Lee and Lee (2014). The coefficients of other independent variables did not reach the significance level.

According to the empirical results shown in Table 2, among the factors influencing an individual bonus ratio, the individual performance coefficient was 0.027, reaching the 5% significance level and indicating that better individual performance increased the individual bonus ratio. The empirical results confirmed the expectations in this study and corresponded to the research findings of Lee (2002), Chen (2008), Chin (2010), Chen (2010), Wu (2012), and Wang (2014). Individuals with better abilities tend to select systems with a higher individual bonus ratio. The gender coefficient was 0.023, reaching the 5% significance level and indicating that male employees had a significantly higher individual bonus ratio than female employees. As such, men were more inclined toward systems with low base salaries and high bonuses. The university education coefficient was -0.025, reaching the 5% significance level and indicating that employees with a bachelor's or higher degree had a significantly lower individual bonus ratio than employees with general or vocational high school education who were more inclined toward systems with a high bonus ratio. The base salary coefficient was -0.152, reaching the 5% significance level and indicating that employees who received a base salary had a significantly lower individual bonus ratio than those who did not. The management type coefficient was -0.302, reaching the 5% significance level and indicating that, in direct selling companies, individual bonus ratios were significantly lower than those in franchising companies. A potential reason for this is that most franchising companies had implemented the low-salary high-bonus systems, whereas most direct selling stores had implemented the high-salary low-bonus system. As a

result, employees in direct selling companies have a lower bonus ratio than those in franchising companies. The coefficients of other independent variables did not reach the significance level.

Table 2: Empirical results

Variable	Individual Performance	Individual Bonus Ratio
Intercept	-3.349 (0.125)	0.454 (0.001)**
Individual bonus ratio	9.647 (0.030)**	—
Individual performance	—	0.027 (0.045)**
Gender	-0.484 (0.011)**	0.023 (0.033)**
Marital status	-0.086 (0.695)	-0.005 (0.710)
Having children under six	0.056 (0.846)	0.012 (0.440)
University education and higher	0.282 (0.251)	-0.025 (0.041)**
College education	0.403 (0.089)*	-0.016 (0.231)
Age	-0.002 (0.888)	0.001 (0.376)
Work experience	-0.011 (0.831)	—
Work experience squared	0.002 (0.407)	—
Hours of work	0.100 (0.003)**	-0.002 (0.343)
Non-brokerage work experience	-0.272 (0.211)	-0.010 (0.419)
Brokerage work experience	-0.104 (0.672)	0.014 (0.271)
Base salary	1.816 (0.012)**	-0.152 (0.001)**
Group bonus	0.435 (0.168)	0.021 (0.243)
Performance requirements	-0.067 (0.759)	-0.011 (0.326)
Type of management	2.469 (0.100)	-0.302 (0.001)**
F	4.402 (0.001)**	72.651 (0.001)**
R^2	0.239	0.832
Adjusted R^2	0.185	0.820

Note: * indicates the 10% significance level; ** indicates the 5% significance level. Values in parentheses are p-values

6. CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH

6.1. Theoretical implications

Past studies mainly explored the one-way influence of the individual bonus ratio on work performance or the influence of work performance on the individual bonus ratio. However, these two factors

interact with each other. An achievement bonus ratio has a significant positive effect on brokers' performance. Brokers with more extensive brokerage experience tended to choose the high-commission pay system (Lee, 2002). This study examined the interrelationship between individual performance and individual bonus ratio to discuss the Self-selection effect among real estate brokers. In this study, individual performance and individual bonus ratio were set as interacting endogenous variables and two-phase simultaneous equations were used in evaluations. Housing brokerage employees' performance referred to their monthly performance. In order to increase the accuracy of the estimation results, the following control variables were incorporated: gender, marital status, having children under six, educational level, age, years of work, hours of work, non-brokerage work experience, brokerage work experience, base salary, individual bonus ratio, group bonus, performance requirements, and type of management.

6.2. Practical Implications

6.2.1. Factors influencing individual performance

With regard to salary structures, an individual bonus ratio and base pay were found to have a significant positive effect on individual performance. Hence, base salary and high individual performance led to better performance among brokers. Base salary served as a guarantee for brokers, particularly for young workers entering the brokerage industry. A higher bonus ratio can stimulate work enthusiasm in brokers, motivating them to invest more in their work. With regard to gender, female brokers were found to have a significantly better performance than male brokers. With regard to education, the individual performance of brokers with college education was significantly higher than those with general or vocational high school education. Longer working hours were related to better individual performance.

6.2.2. Factors influencing the individual bonus ratio

Individual performance has a significant positive effect on the individual bonus ratio, that is, better individual performance resulted in a higher individual bonus ratio. Brokerage employees with base salaries had a lower bonus ratio than those without base salaries. The housing brokerage employees under the direct selling system had a lower individual bonus ratio than those in the franchising system, the reason for which was that the use of the low-salary high-bonus system in franchising and the use of the high-salary low-bonus system in direct selling. Finally, male brokers were more likely to select systems with higher bonus ratios. With regard to education, brokers with general or vocational high school education tended to select systems with higher bonus ratios.

6.2.3. Suggestions for future research

This study explored the relationship between individual performance and individual bonus ratio. The questionnaire in this study touched upon sensitive issues related to housing brokers, such as individual performance and individual bonus ratio, which could influence their willingness to answer the questions truthfully. Future studies may use more simple survey questions in order to increase the response rates and return rates. Furthermore, it was difficult to collect data from self-operated housing brokerage businesses, which made it impossible to examine the differences in the performance of their employees. It is suggested that future studies can conduct an in-depth analysis of brokers' performance in self-operated businesses and brokerage companies under other types of management in order to gain a better understanding about the differences in brokers' performance among brokerage companies that use different types of management.

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