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Fringe benefits compensation offered by employers has grown rapidly over the past 50 years. Research in this area has been primarily limited to hourly and salaried employees. This study examines employer-based fringe benefits compensation of real estate agents and brokers. A model is developed that jointly estimates the income, hours worked, and fringe benefits compensation. The findings indicate that fringe benefits increase according to hours worked and the sales professional's contribution to firm revenue. Other important determinants include managerial duties, firm size and organizational form. For women, fringe benefits do not entice greater productivity (income); however, it does increase effort (hours worked).

Keywords

Fringe benefits; Compensation; Real estate agents

1. Introduction

Researchers have extensively studied the determinants of real estate agent income. The studies are largely based on economic models found in human capital model literature (Mincer, 1970), and models typically include demographic and skill characteristics of agents and their employing firms as well as market variables.[1] Agent income underestimates total compensation by the dollar value of fringe benefits. Graves et al. note substantial omitted variable bias associated with excluding fringe benefits when attempting to examine total compensation. One reason is that the growth in employer fringe benefits as a proportion of the total compensation package has been strong over the past 50 years. Chen (1981) finds that fringe benefits were 5% of total compensation in 1950, but by 1980, it had more than tripled to 15.8%. In March 2010, the Bureau of Labor Statistics (BLS) reported that total benefits were about 30% of the total compensation for civilian workers and private industry, and 34% for state and local government workers.

Sales professionals are compensated differently than salaried or hourly employees because they are often paid on commission. In some cases such as real estate, they frequently act as independent contractors who set their own hours, and have some ability to negotiate their terms of employment.[2] From a fringe benefits perspective, real estate agents and brokers are typically responsible for arranging and paying for their own fringe benefits. This may occur because firms in this industry tend to be relatively small, and therefore lack the ability to have the cost savings associated with large group plans, such as by offering health, life, and disability insurances.

The dearth of research on sales professionals represents an opportunity for further study particularly because of the large number of workers employed in sales occupations. In real estate sales, for example, the BLS *Occupational Outlook Handbook* estimates there were 517,800 real estate brokers and sales agents employed in 2008 with projected employment of 592,100 by 2018.

This research study examines the interaction of fringe benefits with income (productivity) and hours worked (effort) for real estate agents and brokers on split commission with their firms. A model is applied to subsamples of men and women. The findings indicate that fringe benefits affect income and hours worked, but do so differently for men and women. The firm size, as confirmed from previous research, is an important variable that influences fringe benefits, but organizational characteristics influence offerings of fringe benefits as well.

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[1] See Benjamin et al. (2000) for a summary of earnings studies of real estate agents and brokers.

[2] Some agents arrange a 100% commission with their firm, but pay a fee, while others split the commission with the firm (Benjamin et al. (2007, 2009) and Zumpano et al. (2009)).

2. Literature

Employers offer fringe benefits to attract the best workers, but also to retain them. Parker and Rhine (1991) conclude that the offering of fringe benefits reduces employee turnover, and Frazis and Loewenstein (2009) find that the rate of resignation is more responsive to fringe benefits than to wages.

Workers in larger firms are more likely to receive fringe benefits through their employer. Because of cost, small firms more often do not offer extensive benefits packages. The US General Accounting Office (2000) reports that 82% of employees in businesses with fewer than 25 employees do not have pension coverage. Fronstin and Helman (2000) find that 43% of businesses with fewer than 100 employees do not offer health coverage for their workers. This absence of important fringe benefits at many small firms makes them particularly susceptible to employee turnover.

Researchers in the labor literature typically view the labor supply and wages as jointly determined (Moffitt (1984); Lundberg (1985); and Blank (1988)). Wage-hours models have been applied to workers in nonmanufacturing industries, such as construction (Perloff and Sickles, 1987) and physician services (Headen, 1990). Benjamin et al. (2007, 2009) have applied wage-labor supply models to real estate sales professionals although there have been comparatively few such studies.[3] Table 1 summarizes the determinants of wages, earnings, and hours in real estate brokerage; these determinants might logically explain fringe benefits compensation as well.[4] Averett and Hotchkiss (1994, 1995) extend the labor supply–wages model by including fringe benefits compensation. Their model includes three equations: one equation each for the dependent variables of benefits, hours, and natural log of wages.

[3] The wage rate for real estate agents and brokers is determined by income generated from sales and commissions divided by hours worked because there is no contracted wage rate. Benjamin et al. (2007, 2009) note that sample selection problems are associated with full- versus part-time status. Part-time workers may sell primarily to social networks, including friends and family. Although their total income may be modest, the wage (income per hour of work) is greater than the full-time sales professional who must sell outside the network.

[4] Agent income has been shown to be positively related to schooling and experience (Crellin, Frew and Jud (1988); Glower and Hendershott (1988); Jud and Winkler (1998)). Some studies have found that women earn less than men in real estate brokerage (Crellin, Frew and Jud (1988); Sirmans and Swicegood (1997, 2000); Jud and Winkler (1998)) while other studies find no significant difference (Follain, Lutes and Meier (1987)) or a positive effect (Abelson, Kacmar and Jackofsky (1990)). Earnings have been found to increase with firm size (Follain, Lutes and Meier (1987), Sirmans and Swicegood (2000)) and metro area (Sirmans and Swicegood (1998)). Not surprisingly, the same relationships occur with wages as a productivity measure. Hours worked is most often negatively associated with schooling, age, experience and gender, while positively associated with metro areas and the wage rate. See Benjamin et al. (2000) for a summary of earnings studies of real estate agents and brokers.

Table 1 Variables that Influence Earnings, Wages and Labor Supply of Real Estate Brokerage Sales Professionals

Variable	Earnings[1]	Wage[2]	Hours Worked[2]
Age	- / 0	+ / 0	-
Education	+	+ / 0	-
Experience	+	+	-
Gender (female)	-	-	-
Ethnicity (minority)	- / 0	-	- / 0
Marital status (married)	+ / 0	+	0
Owner	+	+	0
Firm size	+	+	+ / 0
Franchise	0	+ / 0	?
Metro area	+	+	+
Wage			+
Hours worked	+	+	

Notes: Key: 0 = neutral or inconclusive effect; (+) positive effect; (-) negative effect
Sources: 1. Benjamin, Jud and Sirmans (2000)
2. Averett and Hotchkiss (1994), Benjamin et al. (2007, 2009), Blank (1988), Headen (1990), Moffitt (1984), and Perloff and Sickles (1987)

Alpert and Ozawa (1986) were among the first to examine fringe benefits offered in the non-manufacturing sector, including office and non-office workers. They find that the marginal tax rate, skills, education level, full-time status, union status, firm size, firm location, and type of industry are positively related to expenditures on fringe benefits. Turner (1987) suggests that the effect of taxes on fringe benefits growth is rather small; however, Royalty et al. (2000) find that the marginal tax rate is positively and significantly related to the probability of offering health insurance, paid sick leave and pensions. Because employers pay taxes on the size of payroll, benefits compensation is less expensive than wages. Workers with low wages and low hours do not gain as much from non-taxed benefits, and prefer cash compensation.

Averett and Hotchkiss (1995) find that hours worked by workers are positively related to benefits. One explanation from the firm's perspective is that the average cost of a fringe benefit to the firm should decline as a worker's hours increase. Albert and Ozawa (1986) argue that employees who earned high wages, and therefore paid high taxes, should possess more benefits as well. Because fringe benefits are a normal good, it is expected that workers should demand more fringe benefits as their earnings increase. Therefore, agent income, hours and fringe benefits could be interrelated variables.

Demographic variables such as gender, ethnicity, age, education, and marital status may affect a worker's preference for fringe benefits compensation as

well. Averett and Hotchkiss (1995) find that female gender, education, and marital status are positively related to fringe benefits. Bernstein (2002) has developed an empirical model that relates to whether a firm offers a particular fringe benefit (pension or health insurance) to the characteristics of both the firm and owner. He finds that education, race, full-time status, and firm characteristics are all related to the probability of offering a pension and health insurance. Clauretie (2002) reports that on average, females have higher medical expenses compared with males, and are more likely to possess medical insurance, consistent with research by Lowen and Sicilian (2009).

Evidence in the labor economics literature, in fact, suggests that the gender wage gap may be partially explained by gender occupational segregation, and that differences in preferences or abilities may explain the segregation. Olson (2002) finds a statistically and economically meaningful trade-off between wages and health insurance for women working full-time. Women accepted about a 20% reduction in wages to move to a job that provides health benefits. Lowen and Sicilian (2009), however, find no significant effects of fringe benefits on wages for either men or women.

Regardless of whether or not fringe benefits compensation explains the wage gap, women may prefer jobs that offer fringe benefits that align with the needs of the family. Lowen and Sicilian (2009) report that while women are more likely to receive "family-friendly" benefits than men, both received family-neutral benefits at about the same rate. Once occupation was incorporated in the analysis, gender does not have a significant influence on the probability of receiving fringe benefits with the exception of parental leave.

Studies have found that fringe benefits are associated with age. Alpert and Ozawa (1986) hypothesize that relatively older workers may demand more security that fringe benefits such as health care insurance offer, but they do not find a statistically significant relationship. Moreover, Clauretie (2002) finds that annual medical expenses paid by the employer's insurance policy increase with age, but at a decreasing rate. Oyer (2008) reports that medical and life insurances appear to encourage long-term employment, and consistent with Averett and Hotchkiss, he finds that married workers are more likely to receive health insurance.

Firm characteristics may influence fringe benefits offerings as well. Alpert and Ozawa (1986), Averett and Hotchkiss (1995), and Claurettie (2000) have all found a positive relationship between firm size and fringe benefits; this positive relationship is also borne out by the BLS compensation data. An efficient purchasing model for fringe benefits is important for employers according to Oyer (2008). This result suggests that large firms have cost advantages in providing fringe benefits because of the economies of scale.

Because fringe benefits are a normal good, consumption should rise with productivity as benefits become more affordable. Therefore, it is necessary to control for total household income rather than just the wage or an individual's income, because fringe benefits affordability should be tied to residual income available from the household rather than just the worker's income.

Although the BLS has total employee compensation data, important information is missing, such as commission split, personal real estate holdings, ownership and firm-specific data. Therefore, data from the Member Survey of the National Association of Realtors® (NAR) is used for this study. The examination of fringe benefits compensation of real estate sales professionals by using the NAR® data permits research into specific sales professional occupations (broker-owner, broker-manager, and associate broker) and organizational form (independent firm versus a subsidiary). The income, hours and fringe benefits relationships are separately examined for males and females as gender may incur significantly different results.

3. Theoretical Model

Suppose the commission split *c* paid by each firm to its sales professionals is an increasing, concave function of productivity *S*: $c = f(S)$, so that sales professionals who are more productive and generate higher gross sales income *S* for the firm receive an equal or higher commission split than those with lower sales. Furthermore, higher producing professionals are able to negotiate a commission split so that the firm's revenue increases with gross sales income, but at a decreasing rate, i.e., the firm's revenue is concave in gross sales income. The sales income of the individual sales professional is cS and the firm's portion (revenue) is $R = S(1-c)$. The commission schedule f therefore satisfies $0 < f + Sf' < 1$, and $2f' + Sf'' > 0$. Also, suppose the productivity of each sales professional is an increasing, concave function of hours worked (effort) *h*: $S = g(h)$.

First, suppose firms do not offer fringe benefits packages. Each sales professional decides on the amount of time that s/he works *h* by maximizing his or her utility $U(w,l)$ over income $w = cS$ and leisure $l = T - h$. The gross sales income is split between the firm and the individual professional, $w + R = S$, and since the firm's revenue is concave, the individual's income is convex in gross sales: $w_{SS} \geq 0$. However, it is assumed that the individual's income is concave in hours worked; this will be the case if $w_{SS}(g')^2 + w_S g'' \leq 0$. It follows that if his or her utility has a negative definite Hessian matrix, then his or her utility as a function of hours worked, $u(h) \equiv U(w(h), l(h))$, is concave and therefore, the solution to the first order

condition (FOC), $U_w w_S g'(h) - U_l = 0$, is necessarily his or her optimal effort. Let h_0 denote the optimal effort of the individual professional, S_0 the corresponding gross sales income, and R_0 the corresponding firm revenue that s/he generates.

Now suppose the firm offers a single benefits package to its sales professionals. The package is determined by the composition of its sales force, firm characteristics, and owner preferences. Because of the firm's size and bargaining power with insurance companies, it could obtain the benefits package at a lower cost than the employee could himself or herself. Therefore the package that costs the firm *b* is worth *kb*, where $k > 1$, to the sales professional.

With no constraints, offering benefits is a cost to the firm with no rewards because a sales professional will optimally choose to work fewer hours while maintaining the same consumption that s/he had with no benefits. To recoup this cost, the firm requires that the sales professional generate an amount *b* in additional firm revenue in order to qualify for benefits. This additional revenue can be generated two ways: 1) the employee can choose to work additional hours, or 2) the employee surrenders some of his or her commission split.

Let c_0 denote the commission split of the sales professional and $w_0 = c_0 S_0$ his or her income before being offered the benefits package. If the sales professional chooses to take a cut in his or her commission split to generate the additional firm revenue *b*, his or her new commission split c_1 is determined by $S_0(1-c_1) - S_0(1-c_0) = b$, i.e., $c_1 = c_0 - \frac{b}{S_0}$. In this case, his or her total income *W* is the sum of his or her sales income and benefits: $W = c_1 S_0 + kb = w_0 + (k-1)b$; thus his or her total income increases while working the same number of hours and s/he is clearly better off than when s/he did not receive benefits. If the employee instead chooses to increase his or her effort to h_1 to generate the additional firm revenue *b*, then the gross sales income that s/he brings in is now $S_1 = g(h_1)$ and his or her new sales income is $w_1 = S_1 - R_1 = S_1 - R_0 - b = S_1 - S_0 + w_0 - b$, and so, his or her new total income is $W = w_1 + kb = S_1 - S_0 + w_0 + (k-1)b$. Compared with the previous case, in which the employee takes a commission cut to generate the additional revenue, his or her income is greater by $S_1 - S_0$ but his or her leisure is reduced by $h_1 - h_0$. Whether his or her utility is greater in this case than in the previous case depends on his or her particular utility functional form. However, there should be some level of effort at which sales professionals will definitely not choose to work any more additional

hours (for fear of suffering from exhaustion), so those with higher income are more likely to reduce income to receive benefits. Thus, there is likely a tradeoff between income and fringe benefits.[5] On the other hand, because professionals cannot reduce their effort in order to receive benefits, benefits should be positively related to both hours worked and the individual's contribution to firm revenue.

4. Empirical Model

The empirical model includes equations for sales professional gross income, hours worked and fringe benefits. While gross income and hours worked are readily definable, fringe benefits data are available as binary variables; whether or not the particular fringe benefit is offered through the employer. Because the relative impact of individual fringe benefits on other variables is likely to be relatively small and dispersed, it is necessary to aggregate information from these separate variables. Factor analysis is an efficient method to capture variation in a related set of variables. The benefits offered include medical insurance (health, dental, and vision), life insurance, disability insurance, errors and omissions (E & O) insurance, a retirement plan (SEP/401K), paid vacation, and a generic "other" fringe benefit. The benefits variable is developed by scoring from the first factor by using a principle components analysis, and the score is estimated from the factor loadings. The factor analysis approach permits the weighing of benefits to account for the variance in the correlations.[6] The primary factor score is then used as an independent variable in an iterative three-stage least squares (3SLS) regression model of income, hours worked and fringe benefits. The fringe benefits (*Benf*) variable is expected to be related to explanatory variables, including salesperson demographics and occupation, firm characteristics, the economic environment, income and hours worked. The variables are described in Table 2.

[5] A special situation occurs for agents on 100% contracts. For these agents, there is no possibility to increase the split to the firm and the firm does not benefit by the agent working more hours. Therefore, the monthly fee would need to be adjusted by the firm to pay for the fringe benefits. The monthly fee data is not available. Therefore, agents on a 100% contract are excluded from the model.

[6] Another approach for using a binary variable is to simply add the number of benefits or to calculate the percentage of total benefits received by the sales professional relative to total benefits available. These measures are tested as well, and the findings from the regression analysis are comparable to using the factor analysis variable. However, the factor analysis variable weighs the fringe benefits according to the correlation with the factor. In addition, it offers a normal distribution centered at zero which is an important consideration when using fringe benefits as a dependent variable in a 3SLS model.

Table 2 Definitions of Variables

Dependent Variables of Sales Professional:	
ln*Ginc*	Natural logarithm of annual gross income
Hrs	Hours worked per week
Benf	Fringe benefits from factor analysis scoring
Demographic Variables of Sales Professional:	
Sch	Years of schooling
Exp	Years of experience in real estate
Expsq	Years of experience in real estate squared
Married	Marital status (*Married* = 1)
Female	Gender (*Female* = 1)
Black	Ethnicity status (*Black* = 1)
Hisp	Ethnicity status (*Hispanic* = 1)
Asian	Ethnicity status (*Asian* = 1)
Abrk	Associate broker status (*Abrk* = 1)
Brkown	Broker-owner status (*Brkow* = 1)
Mgrsel	Manager-sales status (*Mgrse*l = 1)
Comspt (%)	Commission split in percent
Cpinv	Number of commercial properties held for investment purpose by the agent or broker
Rpinv	Number of residential properties held for investment purpose by the agent or broker
Firm and Metropolitan Area Variables:	
Indf	Independent franchise firm status (*Indf* = 1)
Indnf	Independent non-franchise firm status (*Indnf* = 1)
lnFsize	Natural logarithm of firm size measured by the number of sales staff
ln*Mpsh*	Natural logarithm of the median single-family housing price by metropolitan area
Chgemp (%)	Change in employment in the metropolitan area in percent
Income Variables:	
ln*Frev*	Natural logarithm of annual gross firm revenue attributable to the sales professional
ln*Rinc*	Natural logarithm of annual household income minus gross income of the sales professional

The first equation is the specification of a fringe benefits model which consists of variables that capture demographic characteristics, hours worked, gross and residual income, and firm revenue:

$$Benf = \mathbf{Z}\,\boldsymbol{\beta}_1 + \beta_2 Hrs + \beta_3 \ln Ginc + \beta_4 \ln Rinc + \beta_5 \ln Frev + \mu_B \quad (1)$$

where $\mathbf{Z}$ is a matrix of demographic explanatory variables with regression coefficient matrix $\boldsymbol{\beta}_1$; *Hrs* is hours worked by the sales professional; ln*Ginc* is the natural logarithm of annual gross income of the professional; ln*Rinc* is the natural logarithm of the professional's residual income;, and ln*Frev* is the natural logarithm of firm revenue contributed by the professional. The

individual regression coefficients , β_2, β_3, and β_4, are the individual regression coefficients, and μ_B is the error term. The variables in **Z** consists of variables that measure the demographic characteristics of the sales professionals, including: years of schooling (*Sch*), experience (*Exp*), experience squared (*Expsq)*, marital status (*Married*), gender (*Female*), ethnicity (*Black*, *Hispanic*, and *Asian*), and specific real estate sales occupation (*Abrk*, *Brkown*, and *Mrgsel*).

This specification suggests that sales professionals choose their desired level of fringe benefits from among firms that offer different packages; however, more expensive fringe benefits packages require that the firm receive more revenue from the sales professional to pay for the cost of the benefits. Therefore, the agent or broker must choose between receiving more income or fringe benefits.[7]

Sales professionals in the sample differ in their occupational level and duties. For example, associate brokers have neither an ownership position nor managerial responsibilities. However, there are also broker-owners and broker-managers with selling responsibilities. Both should receive more fringe benefits than associate brokers because their time is diverted from sales activities to office and managerial duties. The distinct occupational differences are captured by the associate broker (*Abrk*), broker-owner (*Brkown*), manager-salesperson (*Mgrsel*) statuses.

Two variables for the firm type (independent and non-independent franchises) are included in the model. Independent firms are typically smaller than subsidiaries of larger firms, so both non-franchise and franchise independent firms are expected to offer fewer fringe benefits. To control for economic environment conditions, the natural log of the median housing price and the percent change in employment are included in the model; both variables are expected to be positively related to fringe benefits. These variables are captured by independent non-franchise firm (*Indnf*); independent franchise firm (*Indf*); the natural logarithm of the number of sales staff firm (ln*Fsize*); the natural logarithm of the median metro single-family housing price in 2007 (ln*Mpsh*); and the percent change in employment during 2007 (*Chgemp*).

The number of hours worked per week (*Hrs*) is expected to be strongly and positively associated with fringe benefits. Full-time workers often gain fringe

[7] While it is conceivable that an individual firm could offer various fringe benefit packages of various dollar values, with agents and brokers having to generate higher firm revenue to receive package of greater value, there are practical reasons why this is unlikely. Besides the complexity and administrative cost of managing individual contracts with salespersons, the cost of fringe benefits, such as insurance, decline with the number of enrolled employees. Brokerage firms that offer many different fringe benefits package choices would not be able to offer them at a cost attractive to the firm and their employees.

benefits which are not available to part-timers. The number of hours required to be eligible for fringe benefits is likely to vary by brokerage firm.

Potentially important variables that influence fringe benefits are the gross income from the individual and income from other family members. While gross income from the agent or broker may be predicted to increase fringe benefits consumption, as higher income makes fringe benefits more affordable, there is the opposing argument that suggests that employers who pay for fringe benefits may reduce the sales professional's income in response to offering more fringe benefits. That is, the brokerage firm in a competitive environment will not offer more than it needs to pay. Gross income variable is included in the model in natural logarithm terms as ln*Ginc*.

Income available from other family members may influence fringe benefits consumption; however, it has not been examined in most fringe benefits studies. This variable is particularly important because two-income families are commonplace, and the preference for a fringe benefit package is likely to be related to affordability extended to total household income, not just income from the individual. The effect of residual income on fringe benefits consumption should be positive. The natural logarithm of residual income enters the model, and it is designated as ln*Rinc*.[8]

In addition to income from the individual and residual income from other household members, fringe benefits should increase with agent and broker revenue generated for the firm, where ln*Frev* is the natural log of firm revenue generated by the sales professional. Brokerage firms might offer fringe benefits more often and in greater amounts to agents and brokers who contribute more to the profitability of the firm.

Because there is likely a trade-off between income and fringe benefits, ln*Ginc* is an endogenous variable. The ln*Ginc*, ln*Frev* and *Hrs* variables are endogenous in the *Benf* equation, so they are estimated by using predicted values that use the two-stage least-squares (2SLS).[9] This ensures that the values of the explanatory variables are not correlated with the regression error term.[10]

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[8] The percent income tax rate of the sales professional is excluded from the empirical model because the marginal tax rate is strongly collinear with the salesperson's income. Subsequent tests of this variable also indicate that it does not have a statistically significant relationship with the fringe benefits variable.

[9] In addition, ln*Frev* equation (1a) is also an endogenous variable. The firm's portion of revenue generated by agents and brokers are influenced by the same variables as ln*Inc* because total revenue is split between the individual and the firm; therefore, these independent variables are used for the fitted ln*Frev* regression.

[10] The affordability of fringe benefits should be positively related to the sales professional's income. However, at a given level of total compensation, if a company offers additional fringe benefits, it should reduce income that the firm would offer the

The second equation is the specifications of the labor supply equation:

$$Hrs = \mathbf{X}\boldsymbol{\theta}_1 + \theta_2 \ln Inc + \theta_3 \ln Rinc + \beta_4 Benf + \mu_H \qquad (2)$$

where $\mathbf{X}$ is the matrix of exogenous explanatory variables with regression coefficient matrix $\boldsymbol{\theta}_1$ and the other variables are previously defined. The individual regression coefficients are θ_2, θ_3, and θ_4; and μ_H is the error term. The $\mathbf{X}$ matrix includes the explanatory variables in $\mathbf{Z}$ with some differences. Entrepreneurial variables are added to the labor supply equation to measure skill and wealth. More capable salespersons may keep more commercial and residential properties in their private portfolio for investment purposes. The number of commercial and residential properties in the salesperson's personal portfolio is captured by *Cpinv* and *Rpinv*, respectively. The independent non-franchise firm dummy variable is excluded from this regression; it is not expected that agents and brokers in these firms work more or less hours than others.[11]

A sales professional's income and residual income potentially influence hours worked. Agents and brokers who are successful at generating income are more likely to work more hours; the hours-income relationship is a two-way relationship. The natural logarithm of residual income (ln*Rinc*) is included in the labor supply equation because of the negative relationship between leisure and hours worked (Moffitt (1984)). Salespersons decrease effort in favor of leisure as household income increases (Benjamin et al. (2009)). In addition, there is the direct effect of income on hours worked; higher wages should increase hours worked (Moffitt (1984); Averett and Hotchkiss,(1994)) and this may also be true for income.

Equation (2) also includes the fringe benefits variable (*Benf*); it is anticipated that this variable should have a positive relationship. Kimmel and Kniesner (1998) report that the wage labor supply with regard to hours worked is considerably more elastic for women than men; this finding is consistent with previous research. If fringe benefits are considered to be a substitute for wages, women may be willing to work more hours than men to obtain and keep those benefits.

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worker. Likewise, ln*Frev* is an endogenous variable as firm revenue is defined as the natural logarithm of firm revenue generated by the individual salesperson. Hours worked is an endogenous variable because the availability of fringe benefits may influence hours worked; individuals may need to work more hours to qualify for fringe benefits.

[11] This variable is also subsequently tested in the *Hrs* regression equation, and it is found to be statistically insignificant. Because there is a system of equations with endogenous variables, it is necessary to exclude exogenous variables from each equation to properly identify the equations.

The third equation is the specification for sales professional productivity, which is measured by the natural logarithm of gross income equation as follows:

$$\ln Ginc = \mathbf{Y}\,\boldsymbol{\psi}_1 + \varphi_2 Hrs + \varphi_3 Benf + \mu_W \tag{3}$$

where **Y** is the matrix of exogenous explanatory variables with regression coefficient matrix $\boldsymbol{\psi}_1$, and the other variables are previously defined. The individual regression coefficients are ψ_2 and ψ_3; and μ_W is the error term. The **Y** matrix includes the explanatory variables in the **X** (*Hrs* equation) matrix with the exception of ln*Ginc*, ln*Rinc* and on ln*Frev*. A commission split variable (*Comspt*) is included in the income equation (and not in the *Hrs* or *Benf* equations) to capture the percent of the commission split received by the sales professional.[12] The commission split is measured at the beginning of the year to avoid endogeneity problems. Hours worked (*Hrs*) and fringe benefits (*Benf*) are expected to be positively related to income.

The first step in the empirical process is the estimation of the measure of fringe benefits by using a factor analysis. In the second step, iterative 3SLS is employed to the system of the *Benf*, *Hrs* and ln*Ginc* equations. The 3SLS procedure involves the application of generalized least squares in the simultaneous equation model (SEM); each of the equations is estimated by using 2SLS. The endogenous variables are estimated by using fitted values and all exogenous variables in the SEM. Once the coefficients from 2SLS are calculated, the cross-equation variances and covariances are estimated by using the residuals from each equation. In the final stage, the generalized least squares coefficients are estimated.

An important problem associated with using 2SLS, 3SLS and SEMs is satisfying the order condition for proper identification. The number of excluded exogenous variables from an equation must be as least as large as the number of explanatory endogenous variables. Moreover, the excluded variables should be statistically significant in other equations. If too many exogenous variables are excluded from an equation, but are included in the other equations, a problem of overidentification may occur, which results in a non-unique solution of SEM coefficients. The number of overidentifying restrictions is equal to the total number of exogenous variables in the system minus the total number of independent variables in a given equation.

[12] As a practical matter, sales professionals who receive 100% commission (no split) are considered to be self-employed, so they are eliminated from the empirical estimation. Conversely, sales professionals who receive less than a 40% commission split are considered to be either in training or largely non-sales workers, as the most common commission split is between 60% and 70%. Therefore, they are also removed from the sample.

Therefore, exogenous variables appear in specific equations to achieve the rank condition.[13]

5. Data

The data on fringe benefits of real estate brokerage sales professions is obtained from the 2008 NAR® Member Survey. The survey is for the 2007 calendar year, and represents a random sample of individuals in real estate occupations, including appraisers, brokers, owners, managers, personal assistants, property managers and sales agents, and brokers. In February 2008, NAR® mailed an 89-question survey to a random sample of 72,000 Realtors®; an identical web-based online survey questionnaire was also distributed to another group of 89,400 members. A total of 9,997 responses were received, and the adjusted response rate is 7.7 percent after correcting for undeliverable questionnaires. Median single family home prices were also provided by NAR®; employment data was obtained from the BLS. These data sets were matched by zip code with NAR® data for conducting the regression analysis.

Table 3 shows descriptive statistics of employer fringe benefits in various real estate occupations. The defined sales occupations include sales agent, associate broker, broker-owner (with selling) and manager (with selling). The fringe benefit categories include six insurance policies (health, dental, vision, life, disability, and E & O), a SEP/401K plan, paid vacation days and other benefits.[14] E & O insurance is the most popular employer fringe benefit, and benefits the firm as much, or perhaps more than the individual. Health insurance is the second most popular fringe benefit. Disability and vision insurance are the least offered employer fringe benefits at 6.7% and 7.5%, respectively. Table 3 also indicates that only about 2.1% of the sales agents receive health insurance, and 1.9% has a SEP/401K through the brokerage firm. In comparison, 15% - 30% of administrative support and personal assistant personnel receive these and other benefits. At the higher pay grade of non-sales activities occupations, about 59.4% of non-sales managers receive health insurance and 44.5% have a SEP/401K through the firm. In a direct comparison of managers and broker-owners with and without sales activities, selling personnel receive considerably fewer fringe benefits. Therefore, pay grade and selling/non-selling activity appear to greatly influence the receipt of fringe benefits compensation.

[13] The three-equation SEM in this study omits statistically significant exogenous variables as follows: *Cpinv*, *Rpinv* and *Comspt* in the *Benf* equation, *Comspt* and *Indnf* in the *Hrs* equation, and *Indnf* and ln*Rinc* in the ln*Ginc* equation. The endogenous variables are ln*Ginc*, ln*Frev Hrs* and *Benf*. For this reason, the SEM is exactly identified; therefore, the 3SLS SEM should produce consistent estimators.

[14] The survey question requests that the respondent indicate which (if any) of eight fringe benefits are received by the respondent through the brokerage firm; an additional category described as "other" is available with the opportunity to provide a write-in response.

Table 3 Descriptive Statistics of Employer Fringe Benefits by Real Estate Occupation.

Occupation	Insurance						SEP - 401K	Paid Vacation	Other Benefit	Mean	Sample Size (N)
	Health	Dental	Vision	Life	Disability	E & O					
Administrative support	28.09%	19.10%	14.61%	15.73%	6.74%	20.22%	16.85%	29.21%	1.12%	16.85%	89
Appraiser	11.27%	3.76%	2.35%	6.10%	3.76%	20.19%	12.21%	5.16%	4.69%	7.72%	213
Associate broker	2.26%	1.84%	1.42%	1.09%	1.59%	19.58%	2.26%	0.67%	1.67%	3.60%	1195
Broker owner (no selling)	31.69%	11.97%	4.93%	11.97%	5.63%	35.92%	17.61%	19.01%	2.82%	15.73%	142
Broker-owner (selling)	15.98%	5.37%	3.78%	5.88%	3.27%	26.07%	5.74%	4.94%	2.61%	8.18%	1377
Manager (no selling)	59.38%	38.28%	26.56%	35.94%	28.13%	54.69%	44.53%	63.28%	1.56%	39.15%	128
Manager (selling)	21.14%	12.75%	9.06%	9.06%	6.04%	31.88%	12.75%	19.46%	2.35%	13.83%	298
Personal assistant	23.21%	7.14%	5.36%	8.93%	5.36%	23.21%	8.93%	25.00%	1.79%	12.10%	56
Property manager	26.57%	14.69%	8.39%	11.89%	7.69%	23.08%	12.59%	28.67%	4.90%	15.38%	143
Relocation specialist	16.92%	9.23%	4.62%	13.85%	4.62%	27.69%	13.85%	13.85%	1.54%	11.79%	65
Sales agent	2.08%	1.54%	0.84%	0.99%	0.76%	21.14%	1.92%	0.48%	1.76%	3.50%	6188
Mean	21.69%	11.42%	7.45%	11.04%	6.69%	27.61%	13.57%	19.07%	2.44%	13.44%	9894

Note: * Occupations in **bold** type indicate defined sales occupations.

Similar to most surveys of fringe benefits, the data is limited to a binary response by respondents as to whether or not they received specific fringe benefits; the dollar value of fringe benefits is not available. In an effort to aggregate the nine binary fringe benefit variables into a composite measure that is more robust, a factor analysis of fringe benefits is conducted. First, factor loadings and scoring coefficients are developed for the nine measures of fringe benefits. In the second step, the primary factor score is used as an independent variable in an iterative 3SLS regression model of income, hours worked and fringe benefits.

Table 4 reports the findings of a fringe benefits factor analysis from 6,899 respondents that consist of agents, brokers, managers and owners with selling responsibilities. In addition to the sales requirement, the subsample is limited to respondents who derive at least half of their real estate income from residential real estate brokerage. The method used is a principal components analysis, which seeks to find a linear combination of variables, to extract the maximum variance from the variables. The results of the factor analysis indicate that there are two fringe benefit factors with eigenvalues that exceed 1.0, and these are reported in the table. The eigenvalue for the first two factors are 3.87 and 1.02, respectively. The proportion of variance explained by the first factor is 43%, and 11.3% by the second factor. The first factor has positive loadings with all of the fringe benefits variables while the second has positive loadings for E & O insurance, SP/401K plans, and the category of Other Benefits, although only E & O and Other Benefits have strong factor loadings. Unlike the other insurance products, E & O insurance is directly related to the job with the firm and may also benefit the employer in the event of a lawsuit. Therefore, the first fringe benefit factor appears to represent personal insurance products for the salesperson, while the second includes other non-insurance benefits and job-related E & O insurance. The standardized scoring coefficients are shown in the last two right hand side columns. These scores and factor loadings are used to estimate the fringe benefits variable. Because the explained variance and eigenvalue of the second factor are relatively weak, only the first fringe benefit factor scores are retained for the second step.[15]

In the next stage, a 3SLS regression analysis is conducted for the income, hours and fringe benefits equations. Because the focus of the study is on fringe benefits received through the firm, agents on 100% contracts are excluded from the sample. These sales professionals may solely and directly determine the fringe benefits that they receive, and therefore, the income-hours-fringe benefits relationship may be different for them, compared with others who do not have direct control. On the other end of the split commission scale, sales professionals who receive low splits may have

[15] The second factor scores were estimated for the iterative 3SLS procedure. As anticipated, the second factor coefficient is statistically insignificant in all three regressions.

inadequate incentives to be categorized with the other sales professionals.[16] Real estate sales professionals typically receive half or more of the commission split with the firm, and agents with a low commission split may be trainees, or receiving a fixed salary.[17]

Table 4 Factor Analysis of Fringe Benefits of Real Estate Sales Professionals

	Factor Loading		Factor Variance		Std. Scoring Coefficients	
Fringe Benefit	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
Health Insurance	0.782	-0.023	0.612	0.001	0.202	-0.023
Dental Insurance	0.815	-0.069	0.664	0.005	0.211	-0.068
Vision Insurance	0.761	-0.059	0.579	0.003	0.197	-0.058
Life Insurance	0.780	-0.044	0.609	0.002	0.202	-0.043
Disability Insurance	0.678	-0.005	0.460	0.000	0.175	-0.005
Errors and Omission Insurance	0.315	0.422	0.099	0.178	0.081	0.415
SEP/401K Plan	0.638	0.005	0.408	0.000	0.165	0.005
Paid Vacation	0.658	-0.068	0.433	0.005	0.170	-0.067
Other Fringe Benefit	0.071	0.908	0.005	0.824	0.018	0.892
Eigenvalue			3.869	1.018		
Proportion of Variance			0.430	0.113		
N			6,899			

The summary statistics for the variables in the regression analysis are shown in Table 5. The mean hours worked is more than 40 hours, with salespersons who have about 14.9 years of schooling and 10.3 years of experience. Females and ethnic minorities represent about 60% and 12% of the sample, respectively. About 73% of the sample consists of sales agents with another 16% designated as associate brokers; the remaining 11% are managers or owners with selling responsibilities. For every 100 sales professionals, there are 78 residential properties in their combined personal portfolio and about 12 commercial properties are in their portfolio. The sample has many more independent firms than subsidiaries of a national or regional corporation; about 36% and 45% are franchise and non-franchise independent firms, respectively. Although biased slightly upwards, the average commission split received by the salesperson is about 66.1%. In comparing the female and male subsamples, women on average work approximately 2.78 fewer hours.

[16] In subsequent analyses, the difference between the coefficients including and excluding sole owners and/or 100% commission salespersons is negligible because of the relatively small number of individuals in these groups, but in theory, the exercise of control could distort the findings.

[17] By using this approach, salespersons with less than a 40% split are excluded from the sample, which results in a reduction of 65 observations.

In addition, males are more likely to be broker-owners as well as managers with selling responsibilities.

Table 5 Summary Statistics of Sample

	Total			Females			Males		
Variable	**Mean**	**Std. Dev.**	**N**	**Mean**	**Std. Dev.**	**N**	**Mean**	**Std. Dev.**	**N**
ln*Ginc*	10.554	1.087	1533	10.478	1.077	916	10.665	1.095	617
Hrs	40.840	15.457	1533	39.721	15.010	916	42.502	15.967	617
Benf	-0.049	0.879	1533	-0.066	0.839	916	-0.024	0.936	617
Sch	14.928	1.952	1533	14.821	1.927	916	15.086	1.979	617
Exp	10.296	9.194	1533	10.391	9.149	916	10.154	9.265	617
Expsq	190.470	303.287	1533	191.587	301.067	916	188.812	306.790	617
Married	0.709	0.454	1533	0.683	0.465	916	0.747	0.435	617
Female	0.598	0.491	1533	1.000	0.000	916	0.000	0.000	617
Black	0.040	0.196	1533	0.043	0.202	916	0.036	0.186	617
Hisp	0.046	0.210	1533	0.040	0.197	916	0.055	0.228	617
Asian	0.037	0.189	1533	0.036	0.186	916	0.039	0.194	617
Abrk	0.162	0.368	1533	0.172	0.378	916	0.146	0.353	617
Brkown	0.064	0.245	1533	0.044	0.204	916	0.094	0.292	617
Mgrsel	0.041	0.199	1533	0.034	0.181	916	0.052	0.222	617
Comspt (%)	66.121	13.782	1533	65.650	13.635	916	66.820	13.978	617
Cpinv	0.122	0.600	1533	0.100	0.546	916	0.154	0.672	617
Rpinv	0.781	1.642	1533	0.709	1.454	916	0.890	1.883	617
Indf	0.363	0.481	1533	0.344	0.475	916	0.392	0.489	617
Indnf	0.449	0.498	1533	0.455	0.498	916	0.439	0.497	617
lnFsize	4.380	1.802	1533	4.435	1.795	916	4.297	1.809	617
ln*Mpsh*	5.532	0.527	1533	5.511	0.527	916	5.563	0.526	617
Chgemp (%)	1.032	1.314	1533	1.041	1.322	916	1.019	1.302	617
ln*Frev*	9.775	1.101	1533	9.727	1.103	916	9.847	1.095	617
ln*Rinc*	8.370	4.803	1533	8.836	4.564	916	7.679	5.063	617

6. Findings

Table 6 shows the results of the income, hours and fringe benefits regressions for the combined sample of men and women. The χ^2 statistics of the three regressions are statistically significant at the 1% level. The fringe benefits variable does not have units of measure that are readily interpretable; therefore, the table also reports the standardized beta. It also permits the comparison of coefficients based on the change in standard deviation of the variable.

Table 6 Iterative 3SLS Regressions of Income, Hours and Fringe Benefits.

Variable	Dependent Variable: ln*Ginc*			Dependent Variable: *Hrs*			Dependent Variable: *Benf*		
	Coef.	Std. Beta	T-Value	Coef.	Std. Beta	T-Value	Coef.	Std. Beta	T-Value
Intercept	6.177	-	18.928**	-39.556	-	-6.826**	-1.101	-	-2.971**
Sch	0.012	0.021	1.014	-0.233	-0.029	-1.256	0.003	0.007	0.290
Exp	0.065	0.546	8.610**	-0.501	-0.298	-4.140**	0.003	0.035	0.447
Exp2	-0.001	-0.385	-6.230**	0.011	0.207	2.972**	0.342 [a]	0.001	0.016
Married	0.171	0.071	3.460**	-1.864	-0.055	-2.178*	-0.063	-0.033	-1.184
Female	-0.042	-0.019	-0.912	-0.747	-0.024	-1.009	-0.027	-0.015	-0.599
Black	-0.246	-0.044	-2.142*	0.734	0.009	0.401	-0.073	-0.016	-0.645
Hisp	-0.399	-0.077	-3.708**	5.478	0.075	3.194**	-0.141	-0.034	-1.335
Asian	0.054	0.009	0.444	-2.172	-0.027	-1.114	-0.008	-0.002	-0.068
Abrk	0.024	0.008	0.376	0.916	0.022	0.918	-0.034	-0.014	-0.553
Brkown	0.012	0.003	0.121	3.918	0.062	2.593**	0.184	0.051	1.983*
Mgrsel	0.087	0.016	0.752	1.906	0.024	1.036	0.781	0.176	6.996**
Cpinv	0.080	0.044	2.104*	-0.836	-0.032	-1.374	-	-	-
Rpinv	0.050	0.076	3.583**	-0.669	-0.071	-3.003**	-	-	-
Comspt (%)	0.016	0.197	9.631**	-	-	-	-	-	-
Indf	0.040	0.018	0.858	0.567	-0.017	0.764	-0.195	-0.106	-3.079**
Indnf	-	-	-	-	-	-	-0.126	-0.071	-2.019*
ln*Fsize*	0.038	0.064	2.959**	0.199	0.023	0.960	0.029	0.060	2.221*
ln*Mpsh*	0.146	0.071	3.263**	-1.212	-0.041	-1.696	0.067	0.040	1.529
Chgemp (%)	0.055	0.065	3.155**	-0.127	-0.011	-0.455	0.016	0.024	0.933
ln*Rinc*	-	-	-	-0.264	-0.082	-3.245**	0.008	0.041	1.402
ln*Ginc* (predicted)	-	-	-	9.207	0.648	25.485**	-0.048	-0.060	-1.419
ln*Frev* (predicted)	-	-	-	-	-	-	0.092	0.115	3.066**
Hrs (predicted)	0.039	0.556	27.734**	-	-	-	0.004	0.068	2.471*
Benf (predicted)	0.036	0.029	1.379	1.118	0.067	2.870**	-	-	-
Log Likelihood			-2008.91			-6248.15			-1915.95
χ^2			588.80			248.14			123.00
N			1533			1533			1533

Note: [a.] Coefficient multiplied by 10^{-5}.

* Statistically significant at the 0.05 level.

** Statistically significant at the 0.01 level.

In the ln*Ginc* equation, the coefficients on the demographic, skill, firm and economic environment variables have signs and magnitudes consistent with *apriori* expectations and previous research. The gross income of the sales professional is positively related to experience, marital status, holdings of residential and commercial investment properties, the commission rate, firm size, metro housing price and the change in employment, and negatively related to minority status. Hours worked is positively related to income and statistically significant at the 0.01 level. The fringe benefits coefficient, however, is not statistically significant at the 0.05 level.

The *Hrs* equation results are shown in the next three columns of Table 6. The results indicate that more experienced salespersons work about half an hour a week less per year of experience. This decrease occurs at a decreasing rate. Similarly, salespersons who own residential properties for investment purposes work fewer hours. As expected, hours worked are positively and significantly related to real estate gross income (ln*Ginc*), but negatively related to residual income (ln*Rinc*). Therefore, higher real estate income from the salesperson encourages more hours of work, but salespersons choose to substitute more leisure as residual income from the household increases.

The primary variable of interest is fringe benefits (*Benf*), reported at the bottom of the table. The fringe benefits coefficient of 1.118 is statistically significant at the 1% level. The beta coefficient indicates that a one standard deviation change in the fringe benefits variable is associated with a 0.067 standard deviation change in hours worked. The standard deviation of *Benf* is 0.88; therefore, a one standard deviation increase in *Benf* is estimated to increase hours worked by about 0.059 hours per week. The impact of the *Benf* beta coefficient is considerably smaller than that of ln*Ginc*, as expected, and more comparable to the residual income (ln*Rinc*) in terms of magnitude of the coefficient and standard deviation.

The *Benf* equation results are shown in the last three columns of Table 6. Managers who also sell and broker-owners have more fringe benefits than sales agents. In comparison, the standardized coefficient for managers with selling responsibilities (*Mgrsel*)) is about three times as large as that for broker-owners (*Brkow*). Firm characteristics influence fringe benefits as well. Independent franchises and non-franchises offer less generous fringe benefits than company subsidiaries, and fringe benefits compensation increases with firm size. Hours worked has a positive and statistically significant relation with fringe benefits; the *Hrs* standardized coefficient of 0.068 indicates that a one standard deviation increase in hours worked (15.4 hours) is associated with a 0.068 standard deviation increase in fringe benefits units, which has a mean of approximately zero and a standard deviation of 0.94. While ln*Ginc* beta coefficient of -0.06 is relatively small and not statistically significant, the impact of the natural logarithm of firm revenue (ln*Frev*) is substantially larger as shown by the standardized beta coefficient of 0.115. In this case, a one

standard deviation increase in firm revenue is associated with a 0.115 standard deviation increase in fringe benefits.

Table 7 presents the results of the 3SLS regressions for the female subsample. The three regressions are each statistically significant at the 0.01 level. Although the subsample size is about 60% the size of the combined sample, the individual regressions in general show stronger relationships. In the ln*Ginc* equation, the *Benf* coefficient is not statistically significant, consistent with the findings in the combined sample. In the *Hrs* equation, however, the relationship between fringe benefits and hours worked appears even stronger than in the combined sample. A one standard-deviation increase in fringe benefits is associated with a 0.095 standard deviation increase in hours worked per week. In the *Benf* equation, *Brkown* and *Mrgsel* are statistically significant and have a strong economic impact as well. Managers who are also sales professionals, for example, have substantially more fringe benefits than non-managers. In addition to demographics, firm type has somewhat more statistically significant standardized coefficients for the female only sample, and these coefficients tend to be 40% to 55% larger in absolute value magnitude compared to the combined sample. The standardized beta for ln*Fsize* is likewise 58% larger for the combined sample. Similarly, the standardized coefficient for *Hrs* is 34% larger for the combined sample.

The results of the 3SLS regressions for the male subsample are shown in Table 8. In general, the regressions are not as strong as those for females; however, all regressions are statistically significant at the 0.01 level. The *Benf* coefficient approaches statistical significance at the 0.05 level in the ln*Ginc* equation, but nonetheless falls short. In the *Hrs* equation, the *Benf* coefficient in the male subsample is much smaller in magnitude compared to the female subsample coefficient, and not statistically significant. This suggests that increasing fringe benefits compensation does not increase hours of work. The fringe benefits equation for the male subsample is generally not as strong compared to the female subsample fringe benefits equation. However, experience is positive and statistically significant, unlike in the female and combined samples. A one standard deviation in experience (9.3 years) is associated with a 0.32 standard deviation change in fringe benefits. The primary coefficient of interest is managers who sell (*Mgrsel*); it is about a third larger than the *Mgrsel* coefficient shown for females in Table 6. Unlike the *Benf* equation for the female subsample, the coefficients for firm characteristics (*Indf*, *Indnf*, and ln*Fsize*), firm revenue (ln*Frev*) and hours worked (*Hrs*) are not statistically significant.

Table 7 Iterative 3SLS Regressions of Female Income, Hours and Fringe Benefits.

Variable	Dependent Variable: ln*Ginc*			Dependent Variable: *Hrs*			Dependent Variable: *Benf*		
	Coef.	Std. Beta	T-Value	Coef.	Std. Beta	T-Value	Coef.	Std. Beta	T-Value
Intercept	5.546	-	13.180**	-32.403	-	-4.400**	-0.497	-	-1.108**
Sch	0.029	0.051	1.877	-0.393	-0.050	-1.656	-0.011	-0.024	-0.740
Exp	0.070	0.596	7.445**	-0.539	-0.328	-3.591**	-0.010	-0.111	-1.107
Exp2	-0.001	-0.416	-5.337**	0.011	0.220	2.500*	0.289 [a]	0.104	1.077
Married	0.194	0.084	3.143**	-1.150	-0.036	-1.048	-0.085	-0.047	-1.250
Black	-0.417	-0.078	-2.915**	1.477	0.020	0.659	-0.022	-0.005	-0.164
Hisp	-0.437	-0.080	-2.973**	5.847	0.077	2.554**	-0.103	-0.024	-0.738
Asian	0.127	0.022	0.784	-2.484	-0.031	-0.987	0.194	0.043	1.268
Abrk	0.078	0.027	1.003	-0.224	-0.006	-0.184	0.008	0.004	0.113
Brkown	-0.197	-0.037	-1.375	6.209	0.085	2.792**	0.182	0.044	1.343
Mgrsel	0.019	0.003	0.118	2.143	0.026	0.853	0.491	0.106	3.234**
Cpinv	0.084	0.043	1.591	-1.156	-0.042	-1.396	-	-	-
Rpinv	0.015	0.021	0.763	-0.070	-0.007	-0.223	-	-	-
Comspt (%)	0.015	0.184	6.939**	-	-	-	-	-	-
Indf	0.092	0.040	1.507	-0.220	-0.007	-0.232	-0.261	-0.148	-3.382**
Indnf	-	-	-	-	-	-	-0.185	-0.110	-2.483*
ln*Fsize*	0.031	0.052	1.879	0.080	0.010	0.306	0.044	0.095	2.729**
ln*Mpsh*	0.204	0.100	3.555**	-2.277	-0.080	-2.526*	0.040	0.025	0.737
Chgemp (%)	0.055	0.067	2.465*	-0.012	-0.001	-0.035	0.020	0.032	0.960
ln*Rinc*	-	-	-	-0.360	-0.109	-3.277**	0.013	0.072	1.838
ln*Ginc* (predicted)	-	-	-	9.301	0.667	20.724**	-0.102	-0.131	-2.390*
ln*Frev* (predicted)	-	-	-	-	-	-	0.117	0.154	3.109**
Hrs (predicted)	0.041	0.572	22.306**	-	-	-	0.005	0.097	2.700**
Benf (predicted)	0.005	0.004	0.131	1.700	0.095	3.158**	-	-	-
Log Likelihood			-1189.26			-3703.213			-1100.664
χ^2			355.46			154.41			75.81
N			916			916			916

Notes: a. Multiply coefficient by 10^{-3}; * Statistically significant at the 0.05 level; ** Statistically significant at the 0.01 level.

Table 8 Iterative 3SLS Regressions of Male Income, Hours and Fringe Benefits.

	Dependent Variable: ln*Ginc*			Dependent Variable: *Hrs*			Dependent Variable: *Benf*		
Variable	Coef.	Std. Beta	T-Value	Coef.	Std. Beta	T-Value	Coef.	Std. Beta	T-Value
Intercept	6.990	-	13.786**	-52.772	-	-5.392**	-2.050	-	-3.285**
Sch	-0.008	-0.015	-0.465	-0.044	-0.005	-0.147	0.015	0.032	0.829
Exp	0.057	0.481	4.483**	-0.442	-0.257	-2.116*	0.032	0.320	2.515**
Exp2	-0.001	-0.347	-3.334**	0.010	0.190	1.626	-0.664	-0.218	-1.775
Married	0.149	0.059	1.836	-2.979	-0.081	-2.141*	-0.112	-0.052	-1.299
Black	0.053	0.009	0.278	-0.478	-0.006	-0.152	-0.185	-0.037	-0.956
Hisp	-0.307	-0.064	-1.944	4.402	0.063	1.693	-0.240	-0.059	-1.500
Asian	-0.029	-0.005	-0.156	-2.427	-0.029	-0.783	-0.322	-0.067	-1.687
Abrk	-0.033	-0.011	-0.312	2.643	0.058	1.525	-0.160	-0.061	-1.497
Brkown	0.145	0.039	1.126	2.631	0.048	1.248	0.127	0.040	0.987
Mgrsel	0.166	0.034	0.996	2.198	0.031	0.799	1.001	0.237	6.068**
Cpinv	0.066	0.040	1.196	-0.337	-0.014	-0.372	-	-	-
Rpinv	0.077	0.132	3.882**	-1.168	-0.138	-3.597**	-	-	-
Cspt (%)	0.017	0.216	6.660**	-	-	-	-	-	-
Indf	-0.018	-0.008	-0.244	1.412	0.043	1.189	-0.067	-0.035	-0.628
Indnf	-	-	-	-	-	-	-0.003	-0.002	-0.032
ln*Fsize*	0.054	0.090	2.640**	0.304	0.034	0.895	0.001	0.002	0.048
ln*Mpsh*	0.055	0.026	0.769	0.531	0.018	0.453	0.127	0.071	1.761
Chgemp (%)	0.057	0.068	2.056*	-0.353	-0.029	-0.766	0.003	0.005	0.119
ln*Rinc*	-	-	-	-0.159	-0.051	-1.288	0.005	0.026	0.598
ln*Ginc* (predicted)	-	-	-	9.168	0.628	15.150**	0.027	0.032	0.495
ln*Frev* (predicted)	-	-	-	-	-	-	0.059	0.070	1.241
Hrs (predicted)	0.037	0.533	16.706**	-	-	-	0.002	0.028	0.670
Benf (predicted)	0.075	0.065	1.901	0.503	0.029	0.771	-	-	-
Log Likelihood			-799.749			-2524.11			-783.219
χ^2			261.99			120.58			101.66
N			617			617			617

Notes: a. Multiply coefficient by 10^{-3}; * Statistically significant at the 0.05 level; ** Statistically significant at the 0.01 level.

7. Conclusion

This study has examined employer-based fringe benefits compensation of real estate sales professionals. Fringe benefits studies most often focus on hourly or salaried workers and studies of fringe benefits of sales professionals have been relatively uncommon. This study transforms fringe benefits by using a factor analysis to construct a continuous aggregated variable, and thereafter, models fringe benefits with income and hours as a set of three interrelated equations.

The findings suggest that income, hours worked and fringe benefits are interrelated and should be jointly estimated. The offering of fringe benefits increases hours worked; likewise, hours worked also increases fringe benefits. While a strong positive effect of hours worked exists for women, this relationship is not statistically significant for men. This finding suggests that women find fringe benefits as an enticing incentive to work additional hours; men apparently are not motivated as much by fringe benefits. If fringe benefits are considered a substitute for more income or wages, this result is consistent with the findings by Kimmel and Kniesner (1998) and others of a more elastic wage labor supply coefficient for women versus men. That is, women are willing to work more hours for higher wages, but also appear to respond to offerings of employer fringe benefits.

For the combined sample of men and women, income is not associated with an increase in fringe benefits. However, there are differences based on gender. For men, the fringe benefit coefficient is positive, and while short of statistical significant in the income equation, there appears to be some evidence that fringe benefits may entice men to work harder and generate additional income. For women, fringe benefits do not have a statistically significant impact on income. Olson (2002) reports that married women with health insurance through their employer accept about 20% lower wages than if they worked on a job without fringe benefits. Therefore, the finding that the fringe benefits coefficient is close to statistical significance at the 0.05 level and positive in the income equation for men, but not near statistical significance for women (despite the considerably larger sample), may be indirectly supportive of Olson's finding.

The incongruence in these findings could relate to how men and women view fringe benefits, and also, suggest that different motivational and incentive structures should be considered as firms need to attract sales talent. It should be noted that women work fewer hours per week on average, which makes it more difficult for them to qualify for fringe benefits based on either the hours worked or productivity measures, such as sales quotas.

In the combined sample, fringe benefits are elevated for broker-owners and managers with selling responsibilities; compared to sales agents; associate

broker status does not offer additional fringe benefits. If associate broker status is viewed as a promotion, it may offer monetary advantages, but fringe benefits do not appear to be augmented. Conversely, management and ownership are objectives agents and brokers are strongly related to receiving additional fringe benefits.

Independent firms offer fewer fringe benefits, and in addition, larger firms offer more fringe benefits. This is consistent with the findings of most other research in which larger firms tend to offer more fringe benefits; these findings augment the literature by showing that independent firms offer fewer benefits. This finding could be related to the employer's ability to secure cost-effective fringe benefits packages; moreover, subsidiaries of larger firms may be able to negotiate more favorable terms.

In addition to agent management and ownership functions, firm size and structure, the hours worked, and the firm-generated revenue by the agent are all positively and significantly related to fringe benefits. An analysis by gender reveals, however, that this relationship is confined to the female subsample. One explanation is that females choose to receive fringe benefits through firm revenue thresholds or targets; males may prefer to receive compensation in income and purchase fringe benefits themselves.

An interesting finding is that as sales professionals increase their income, holding constant the firm's portion of revenue, there is evidence that they will receive fewer fringe benefits from the firm. While this relationship is just short of a 0.05 level of significance for the combined sample, it has strong statistical significance for the female subsample. This finding is consistent with the theory that when a firm offers a total compensation package to an agent or broker; if more income is desired, given a level of revenue produced by the agent or broker for the firm, fringe benefits are less.

Neither ethnicity nor gender appears to influence fringe benefits for either men or women; however, experience is a factor that influences the men's interest in fringe benefits. Women do not seem to increase fringe benefits consumption as their experience increases.

Residual income in the household is often ignored in the system of productivity, hours and fringe benefits equations. Consistent with the wage-hours models, additional residual income decreases hours worked. However, while residual income is positively associated with fringe benefits, the relationship is not statistically significant.

This study offers the potential for additional research questions. While it examines fringe benefits as a whole, the effect of individual fringe benefits on income and hours worked has not been examined. Also, only real estate sales professionals have been included in the regression analysis; no analysis has

been conducted for others, such as appraisers, property managers and personal assistants and administrative support staff.

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