
Broker beauty and boon: a study of physical attractiveness and its effect on real estate brokers' income and productivity

Sean P. Salter^{a,*}, Franklin G. Mixon Jr^b and Ernest W. King^c

^a*Department of Economics and Finance, Jennings A. Jones College of Business, Middle Tennessee State University, Murfreesboro, TN 37132, USA*

^b*D. Abbott Turner College of Business & Computer Science, Columbus State University, Columbus, GA 31907, USA*

^c*Department of Finance, Real Estate and Business Law, College of Business, University of Southern Mississippi, Hattiesburg, MS 39407, USA*

This study examines beauty and its effect on real estate agents' wages. We develop a model of beauty and real estate agent wages, performing empirical tests of the theory. We apply Two-Stage Least Squares (2SLS) methodology to a combined data set that includes multiple listing service data and a unique survey designed to measure individual agents' beauty or attractiveness; the analysis takes two forms: transaction-level analysis and agent-level analysis. Results suggest that beauty augments more attractive agents' wages and that more attractive agents use beauty to supplement classic production-related characteristics such as effort, intelligence and organizational skills.

Keywords: real estate brokers; real estate markets; human capital; financial economics

JEL Classification: G00; L85

I. Introduction

Beauty has been identified as having a significant effect on individuals' earnings. Hamermesh and Biddle (1994), Biddle and Hamermesh (1998), Pfann *et al.* (2000), Hamermesh *et al.* (2002), and Hamermesh and Parker (2005) examine several labour markets and determine the effect of participants' perceived beauty in those markets. In each

instance, an individual's beauty is shown to affect success in markets that place a high value on human capital and interpersonal interaction.¹ Real estate labour markets share many characteristics with those studied by Hamermesh *et al.*, yet the impact of beauty on real estate professionals' wages, performance, or effects on market outcomes has yet to be examined.

In existing models of real estate brokerage, varying assumptions regarding agents, their characteristics

*Corresponding author. E-mail: sean.salter@mtsu.edu

¹For a discussion of human capital in labour markets, see, for example, Becker (1985).

and their abilities are made. For example, Yavas (1992) presents a search model that highlights buyer and seller behaviour when a real estate broker is employed; Yavas' model assumes that brokers are homogeneous as to type and that all agents respond identically to incentives or disincentives. Arnold (1999) also presents a search model that emphasizes seller and buyer behaviour, focusing only peripherally on homogeneous brokers and their incentive structures. Anglin (1997) examines buyer search and allows agents to vary by firm size and franchise affiliation, but the search effort and other work factors are attributed to the buyer. Apart from firm size and franchise affiliation, agents are homogeneous in the Anglin model. We examine agent wage (and, therefore, incentives) and its link to production of transaction outcomes that sellers prefer. Using factors such as franchise affiliation and agent specialization, among others, we allow agents to differ significantly, and we measure these factors' influence on transaction outcomes. Our main factor of interest, beauty, is among those modelled theoretically and empirically.

We address the issue of beauty and its effect on real estate agent wages. In this article, we use the term 'wage' to describe an agent's earned income from professional activities and not the specific percentage commission earned on each transaction. While an agent may negotiate his or her commission with each buyer or seller in a given transaction, we see that, as a practical matter, the percentage commission is generally consistent across a given market.² Thus, we assume that the primary determinant of an agent's wage is the transaction price.³ Also of interest is the effect that beauty may have on the timing of the receipt of these earned commissions. Using the theory developed by Hamermesh and Biddle (1994), we model the effect that beauty may have on an agent's wage. This theory allows for agents' specialization, affiliation, human capital and beauty.

Using our assumptions regarding the nature of agent income and our theoretical model, we may then present our research question in a more applicable format: Does agent beauty (or attractiveness) affect transaction prices and/or time on the market? Our initial analysis applies Two-Stage Least Squares (2SLS) methodology to Multiple Listing Service (MLS) data that have been paired with a unique survey instrument designed to measure perception of

agents' beauty. From this initial analysis, we draw specific conclusions regarding our theory and identify some areas of interest for a secondary analysis. In the secondary analysis, we use the MLS data from the initial stage in a form that is aggregated by the agent. Subsequently, we are able to draw some robust conclusions from the empirical tests of our theory.

In the next section, we develop a theoretical model of an agent's (broker's) wage that includes, among other factors, the agent's physical attractiveness (or beauty). Using this model as a guide, we then discuss our empirical tests of the theory in Sections III and IV. Section IV presents a discussion of the empirical results and their connection to the theory. The final section concludes the article.⁴

II. A Model of Beauty and Broker Wage

As we begin our examination of beauty and its effect on a real estate agent's wage, we develop a theoretical framework within which we may study beauty's effect on the specialized functions performed by real estate agents. Hamermesh and Biddle (1994) present a model of wage in which each worker, i , receives an endowment of productivity-related characteristics, X_i , and a level of physical attractiveness or beauty, θ_i . For a given occupation j , the productivity-related characteristics receive importance a_j , while beauty receives importance b_j . The resultant wage is reflected in Equation 1, as

$$W_{ij} = a_j X_i + b_j \theta_i \quad (1)$$

Assuming that workers know Equation 1, it follows that workers choose the occupation that yields the highest wage. Hamermesh and Biddle (1994) points out that there are a number of interesting consequences of this assertion. First, an attractive (unattractive) worker may choose an occupation that places a low (high) importance on attractiveness if his or her productivity-related characteristics allow for the highest wage to be earned in that occupation. A second consequence is, assuming productivity characteristics are uncorrelated with beauty, that attractive workers will earn more than their less attractive counterparts. The authors also discuss the possibility that wage differences might arise not from productivity differences but from

²The reader should consult Munneke and Yavas (2001) for a detailed presentation of the agent contract choice problem.

³Data on actual earnings of the agents are not available in the MLS dataset that we use later in this study.

⁴Throughout this work, we use the terms 'agent', 'broker' and 'real estate professional' interchangeably to describe individuals who facilitate residential real estate transactions by listing properties for sale in an MLS and/or by marketing such properties to prospective buyers.

employer discrimination against the less attractive. In any event, it is plausible that beauty may impact a worker's wages.

We adapt Equation 1 for residential real estate agents. We assume that an agent's income or wage is based on revenue-producing transactions, specifically (1) taking listings and (2) producing closings or sales. An agent possesses some level of skills and abilities that are related to the duties of a real estate agent: communication skills, personality, salesmanship, organization, diligence, intelligence, etc., and these are represented by X_i . In fact, some productivity-related characteristics may be more advantageous to listings than to sales, so we may partition X_i into ($X_L | X_S$), which correspond to listing activities (L) and selling activities (S). For example, organization may play a much larger role in listings than it does in sales, while salesmanship might be more important to selling than to listing.

Potential customers or consumers perceive agents to be attractive or less attractive; this evaluation results in θ , with larger θ indicating greater attractiveness. It is reasonable to assume that beauty may affect an agent's productivity in two main ways: direct interpersonal contact (i.e. face to face activity) and advertising (Internet, magazine, newspaper, television, billboard, etc.). In both of these types of circumstances, a more attractive agent may gain an advantage over a less attractive agent, even if the less attractive agent has superior productivity-related characteristics. In essence, beauty (θ) may supplement or complement productivity-related characteristics and represent a 'trump card' that favours its possessor.

Finally, an agent's affiliation with his or her firm may affect productivity. Specifically, franchise affiliation has been demonstrated as a factor necessarily considered when examining real estate brokerage. We include franchise affiliation (F), therefore, in our model. Along with these constructs, we also consider the manner in which agents are compensated. It is the norm that an agent receives remuneration on a per-transaction basis (i.e. a percentage commission structure); thus, higher productivity translates into higher income in practice. Such a compensation mechanism clearly creates an incentive compatible contract between the agent and the seller.

Consider an agent with productivity P , with P partitioned ($P_L | P_S$) for listing and selling productivity, respectively. We can represent these partitions as

$$P_L(X_L, \theta, F) \quad \text{and} \quad P_S(X_S, \theta, F) \quad (2)$$

If we assume that the relative importance of productivity-related characteristics, beauty, and

franchise affiliation is constant across a given residential real estate market, then we can define the listing and selling production functions as

$$P_{Li}(X_{Li}, \theta_i, F_i) = a\varepsilon X_{Li} + b\theta_i + cF_i \quad (3)$$

and

$$P_{Si}(X_{Si}, \theta_i, F_i) = \alpha(1 - \varepsilon)X_{Si} + \beta\theta_i + \gamma F_i \quad (4)$$

respectively. In Equation 3, we use a as the relative importance of X_{Li} , b as the relative importance of beauty to the listing process, and c as the relative importance of franchise affiliation in the listing process. Similarly, Equation 4 uses α as the relative importance of X_{Si} , β as the relative importance of beauty in the selling process, and γ as the relative importance of franchise affiliation in the selling process. We introduce ε as the fraction of the individual agent's total effort used in listing activities with $(1 - \varepsilon)$ representing the balance remaining for selling activities.

Note that for the listing production function (3), productivity is increasing in all three factors. The agent must use the skills and abilities in X_{Li} to obtain listings, with beauty augmenting the production process along with franchise affiliation; a similar equation is presented for selling activities in (4). In keeping with our earlier assumption, both Equations 3 and 4, indicate that an agent may use beauty and/or franchise affiliation to supplement or complement X_{Li} and X_{Si} . Additionally, ε allows for an agent to fully specialize in listings ($\varepsilon \rightarrow 1$) or sales ($\varepsilon \rightarrow 0$) or to produce a mix of listings and sales ($0 \rightarrow \varepsilon \leftarrow 1$). From Equation 3, it is possible that a selling specialist with $\varepsilon \rightarrow 0$ may produce some low level of listings simply because he or she works at a franchise office or because his or her physical beauty may have drawn a seller to him or her through advertising activities. It is also possible in Equation 4 that the inverse may be true.

Here, productivity is constrained neither to quantity of transactions nor to earnings per transaction; this allows for multiple paths to productivity, given X , θ and F . Note also that productivity in our model may be achieved through specialization in listing activities, specialization in selling activities, or activities in a mixture of listings and sales. This freedom mimics present conditions in the labour market for residential real estate brokerage services.

The agent's wage equation, for the i th agent is

$$W_i = [P_L(X_L, \theta, F)]P_S(X_S, \theta, F) \quad (5)$$

Substituting Equations 3 and 4 into Equation 5 yields

$$W_i = a\varepsilon X_{Li} + b\theta_i + cF_i + \alpha(1 - \varepsilon)X_{Si} + \beta\theta_i + \gamma F_i \quad (6)$$

When simplified, Equation 6 may be represented as

$$W_i = a\epsilon X_{Li} + \alpha(1 - \epsilon)X_{Si} + (b + \beta)\theta_i + (c + \gamma)F_i \quad (7)$$

or

$$W_i = a\epsilon X_{Li} + \alpha(1 - \epsilon)X_{Si} + \delta\theta_i + \mu F_i \quad (8)$$

In the empirical analysis that follows, our primary motivation is to examine the impact of beauty on agent wage. Our empirical analysis will focus on two components that affect an agent's wage: the selling price (which determines the agent's compensation, given a fixed commission) and the time on the market (which determines when – or if – the agent will be paid). An additional benefit of our analysis is that we will also gain perspective on the impact of franchise affiliation on the brokerage environment, and we will be able to place our results in the context of prior studies that have examined franchise status along with core brokerage variables.

As we examine transaction-level and aggregate data, we focus on the impact of beauty while controlling for traditional brokerage variables. Specifically, we expect that beauty will enhance productivity for both listing and selling agents. We must note that we are unable to measure X_L and X_S , since these are generally unobservable; however, our measurement of θ and F will allow us to draw some conclusions regarding X_L and X_S .

III. Data and Methodology

The data for the study are drawn from a variety of sources. The primary source of the data used is a MLS that serves a Southeastern Metropolitan Statistical Area (MSA). This MLS provides information regarding property transactions for properties that were listed between 15 June 2000 and 27 November 2007, including both sold and unsold properties. Further, we use only those observations for which we have a full complement of data for each estimation, including instrumental variables and agent characteristics. We utilize these data at a transaction level and an aggregate level. Specific variables are discussed in the following text.

On a transaction level, we examine a property's selling price and its time on the market as measures of agent performance. Prior studies have identified selling price and marketing time as the major factors that best represent or measure a seller's or buyer's

desired transaction outcome, including the recognized selling price/marketing time tradeoff.⁵ To explain these performance metrics, we use a mix of standard brokerage variables that represent property characteristics along with several variables that provide information about the listing agent and the selling agent, and their activities and affiliations.

Basic physical characteristics employed include the age of the property in years (*Age*), the size of the structure in square feet (*Size*), the number of bedrooms (*Bedrooms*), and the number of bathrooms (*Bathrooms*) present. As a specific control, we include an indicator variable, *NewConstruction*, which equals one if the property is a new, previously unoccupied property. We also include latitude (*Latitude*) and longitude (*Longitude*) coordinates as location controls. In an attempt to control for property quality, we include a number of characteristics that are associated with differing levels of quality construction: brick siding (*Brick*), hardwood flooring (*WoodFloor*), and granite countertops (*GraniteCounter*). Brick siding is the most common of the three and represents the entry level quality control, while hardwood flooring is the intermediate level quality control and granite countertops are the top level quality control. As usual, we assume that the correlation between these proxies and actual quality will not be perfect but will persist in a manner sufficient to provide proper model fit. Because our data are drawn from an extended period, we include an index for time in our model as well. The interested reader should consult Sirmans *et al.* (2005) for an exhaustive discussion of the most prevalent physical property characteristics.

The second set of variables includes factors that are related to the brokerage activities for each property. The activities to which a certain agent devotes his or her time and effort and the degree to which that specialization or diversification occurs may affect the residential real estate brokerage process. Johnson *et al.* (2007) suggest that listing specialization may improve agent income, while specializing in sales may reduce agent income. Additionally, Turnbull and Dombrow (2007) present a similar result, albeit in terms of selling prices rather than agent income. We include two calculated variables as controls for the specialization decision: *ListAgentListSpecial* and *SellAgentListSpecial*. We calculate the number of listings taken by each agent divided by the sum of the number of listings taken by each agent and the number of sales closed by each agent. Then, for each transaction, we include this calculation for the listing

⁵ See Miller (1978) and Haurin (1988) present seminal studies. The interested reader may also consult Yavas and Yang (1995), Glower *et al.* (1998) and Anglin *et al.* (2003) for three subsequent studies of the price/time tradeoff.

agent (*ListAgentListSpecial*) and the selling agent (*SellAgentListSpecial*). Based on the findings of prior studies, we expect that *ListAgentListSpecial* will be positive and statistically significant in our pricing model, while *SellAgentListSpecial* should be negative and significant in explaining selling price.

As controls for agent activity, we include controls for franchise affiliation for both the listing and selling agent (*ListAgentFran* and *SellAgentFran*, respectively); Colwell and Marshall (1986), Frew and Jud (1986), and Lewis and Anderson (1999) all indicate that franchise status has a significant effect on productivity. We also include a control that indicates whether the same agent was both the listing and the selling agent (i.e. initiated and completed both ends of the transaction) through the indicator *ListAndSell*. In response to Rutherford *et al.* (2007) and Levitt and Dubner (2005), who suggest that agents sell their own properties at higher prices than their clients' properties, we control for sales of agent-owned properties (as disclosed through the MLS) through a dummy variable, *OwnerBroker*.

An additional control is included for extremely short marketing periods (*QuickSale*). Sirmans *et al.* (1995) and Johnson *et al.* (2005) examine this phenomenon, with the former finding no pricing impact for 'quick sales' and the latter finding a positive pricing premium for 'nontraditional broker-marketed' properties; in essence, both studies examine extremely short listing periods for property sales that successfully closed. Although some previous research suggests that agent's race and gender are unimportant in residential brokerage activities (Turnbull and Dombrow, 2007), we include controls for the race (*ListAgentRace* and *SellAgentRace*) and gender (*ListAgentGender* and *SellAgentGender*) of both the listing agent and the selling agent in order to properly specify our empirical model.

The most important component of our data, however, is obtained through a survey designed to determine respondents' assessments of individual agents' beauty or attractiveness. Specifically, individual respondents were shown photographs ('head shots') of agents involved in transactions recorded in our MLS. These photographs were taken from the agents' own websites and were unaltered except for occasional resizing. Respondents were asked to rate each individual depicted for 'physical attractiveness or beauty' on a scale of one (1) to 10 (10), with one representing 'Very Unattractive' and 10 representing 'Very Attractive.' No reference was made to the agents' professions or identities, and the survey was conducted in a geographic area far removed from the agents' market to ensure anonymity and to reduce the potential for bias. Individuals were given the

opportunity to choose to rate photographs of male agents or female agents. Once a sufficient number of ratings were obtained (Total Respondents = 402), we calculated the average rating for each agent; we use this average rating as our metric for others' perception of the individual agent's attractiveness or beauty. A hypothetical sample rating page is presented in the Appendix. This rating system both mimics and improves upon that used by Biddle and Hamermesh (1998); while the basic rating process is similar, our respondent group is significantly larger.

We utilize these data in a traditional manner by examining selling price and time on the market at a transaction level. It is this analysis that will demonstrate whether or not agents' activities are affected by beauty, whether that beauty is their own or that of another agent. We also aggregate the data by agent, however, so that we may draw inferences regarding the listing and selling activities undertaken by individual agents during our study period and the effect of beauty at the agent level. We construct the number of listings, the number of sales, the number of revenue transactions, and the dollar values for each as well as the dollars per listing and per sale associated with each agent. We may gain some insight into the agents' working strategies using beauty as an explainer. Selected summary statistics for key variables in the transactions-level analysis are presented in Table 1.

In the transactions-level analysis, our data suffer from significant heteroscedasticity based on White's (1980) test. As such, we apply White's correction to our data using a Weighted Least Squares (WLS) approach. Additionally, we use 2SLS methodology to address the endogeneity issue that exists because selling price and marketing time are codetermined. Given that our data have the potential for serial correlation, we examine the Durbin-Watson (1950) statistic for the standard models; the test statistics fall within acceptable ranges, and thus we do not employ a correction for serial correlation. Variance Inflation Factors (VIFs) for all explanatory variables in all models are provided, and all VIF values are far less than the maximum of 10 suggested by Kutner *et al.* (2004). Hence, we conclude that collinearity is not a significant issue in our models.

We apply this heteroscedasticity-corrected 2SLS methodology to model selling price (*SellingPrice*) and time on the market (*DaysOnMarket*). The transaction-level analysis yields coefficient estimates and statistical significance estimates corresponding to standard regression analysis. From a theoretical standpoint, this analysis answers one main question: Does beauty impact the residential real estate market mechanism in a way that matters to the seller or the buyer? If the answer to this question is in the

Table 1. Selected descriptive statistics – transaction-level data

Variable	Mean	SD	Median	Minimum	Maximum
<i>SellingPrice</i>	\$144 883.31	\$97 267.88	\$125 000.00	\$4400.00	\$1 160 000.00
<i>DaysOnMarket</i>	105.88	114.98	73.00	0.00	1421.00
<i>Age</i>	18.61	22.80	8.00	0.00	198.00
<i>Size</i>	1988.93	811.65	1829.50	414.00	11 000.00
<i>Bedrooms</i>	3.26	0.67	3.00	1.00	8.00
<i>Bathrooms</i>	2.15	0.74	2.00	1.00	6.50
<i>NewConstruction</i>	0.31	0.46	0.00	0.00	1.00
<i>Brick</i>	0.73	0.44	1.00	0.00	1.00
<i>WoodFloor</i>	0.11	0.32	0.00	0.00	1.00
<i>GraniteCounter</i>	0.03	0.18	0.00	0.00	1.00
<i>ListAgentListSpecial</i>	0.61	0.10	0.59	0.13	1.00
<i>SellAgentListSpecial</i>	0.56	0.14	0.58	0.00	1.00
<i>ListAgentFran</i>	0.79	0.41	1.00	0.00	1.00
<i>SellAgentFran</i>	0.82	0.39	1.00	0.00	1.00
<i>ListAndSell</i>	0.24	0.43	0.00	0.00	1.00
<i>OwnerBroker</i>	0.01	0.10	0.00	0.00	1.00
<i>QuickSale</i>	0.05	0.22	0.00	0.00	1.00
<i>ListAgentRace</i>	0.03	0.16	0.00	0.00	1.00
<i>SellAgentRace</i>	0.03	0.18	0.00	0.00	1.00
<i>ListAgentGender</i>	0.30	0.46	0.00	0.00	1.00
<i>SellAgentGender</i>	0.25	0.43	0.00	0.00	1.00
<i>ListAgentBeauty</i>	2.93	0.94	2.57	1.45	6.92
<i>SellAgentBeauty</i>	2.97	0.97	2.61	1.45	6.97

Notes: The descriptive statistics in this table are calculated for the entire sample ($N=3656$). *Size* is the structure's size in square feet. *ListAgentListSpecial* indicates the level of listing specialization by a particular property's listing agent, while *SellAgentListSpecial* indicates the level of listing specialization by a particular property's selling agent. *ListAndSell* indicates that the same agent both listed and sold the property in question. *OwnerBroker* indicates that the property seller was a real estate agent. *QuickSale* indicates that the property has a listed time on the market of zero days or 1 day. *ListAgentBeauty* is the average rating of the listing agent's beauty as rated by our survey respondents. *SellAgentBeauty* is the average rating of the selling agent's beauty as rated by our survey respondents.

affirmative, then the analysis will also inform us as to the way that beauty affects selling price and marketing time. Once we establish the manner in which beauty affects these standard metrics at the transaction level, we will perform a second form of empirical analysis.

The second level of analysis involves aggregating the transaction-level data at the agent level. Using the aggregated agent-level data, we estimate Ordinary Least Squares (OLS) regressions to gain insight into the ways that beauty affects activity at the agent level. In practice, we fit four parsimonious OLS models, all of which employ five independent variables: *Race*, *Gender*, *Franchise*, *ListingSpecialist* and *Beauty*, corresponding to the individual agent's race (1 = non-white), gender (1 = male), franchise status (1 = franchise affiliate), degree of listing specialization, and beauty, respectively. The four dependent variables for these estimations are the number of listings taken by the agent (*NumberListings*), the number of sales taken by the agent (*NumberSales*), the dollars per listing sold for each agent (*DollarsPerListing*), and the dollars per sale for each agent (*DollarsPerSale*). The aggregated agent-level

data suffer from none of the heteroscedasticity, collinearity, or serial correlation issues, and thus no corrections are necessary in any event. Table 2 presents selected summary statistics for the aggregated, agent-level data.

We should also note that we apply affine transformations to the variables appearing in the empirical models to ensure proper model fit. Because the nature of the transformations preserves the ordinal nature of the original data, we refer to the statistical significance of a certain independent variable or its general effect on the dependent without referencing the specific transformation.

IV. Results

Tables 3 and 4 present the results of the White-corrected 2SLS estimations for selling price and time on the market. Note that the R^2 and adjusted R^2 values are comparable to prior studies utilizing similar data, and the F -test for goodness-of-fit indicates model propriety in both instances. In the

Table 2. Selected descriptive statistics – agent-level data

Variable	Mean	SD	Median	Minimum	Maximum
<i>NumberListings</i>	52.10	49.38	35.00	3.00	236.00
<i>NumberSales</i>	36.30	29.10	26.50	4.00	139.00
<i>DollarsPerListing</i>	\$133 667.74	\$40 226.51	\$131 838.06	\$31 000.00	\$265 530.22
<i>DollarsPerSale</i>	\$139 134.16	\$38 701.22	\$140 136.28	\$54 678.01	\$278 638.31
<i>Beauty</i>	3.34	1.23	3.06	1.45	6.92
<i>Race</i>	0.08	0.27	0.00	0.00	1.00
<i>Gender</i>	0.33	0.47	0.00	0.00	1.00
<i>Franchise</i>	0.76	0.43	1.00	0.00	1.00
<i>ListingSpecialist</i>	0.56	0.13	0.58	0.00	1.00

Notes: *NumberListings* is the total number of listings taken by an agent. *NumberSales* is the total number of sales taken by an agent. *DollarsPerListing* is the average value of an agent's listings that were sold in the sample period. *DollarsPerSale* is the average value of an agent's sales in the sample period. *Race* is the agent's race (White = 0, Nonwhite = 1). *Gender* is the agent's gender (Female = 0, Male = 1). *Franchise* indicates franchise affiliation. *ListingSpecialist* indicates the agent's degree of listing specialization, with the number of listings taken over the study period calculated as a percentage of the total number of an agent's transactions. *Beauty* is the agent's average rating of the agent's beauty as rated by our survey respondents.

discussions that follow, we present results related to main effects and ignore polynomial effects that were included solely to improve model fit.

Hedonic pricing model

Variables related to basic physical characteristics generally carry expected signs and statistical significance levels. Older properties (*Age*) generally sell at lower prices, while larger properties (*Size*) and properties with more bathrooms (*Bathrooms*) receive pricing premia for those characteristics. The sole surprise in this group of explanatory variables is *Bedrooms*, which carries a negative sign and is statistically significant. Our *a priori* expectation is that properties with a larger number of bedrooms should exhibit higher selling prices; however, Sirmans *et al.* (2005), which examines existing real estate studies that utilize hedonic pricing models, reports that nine of the 40 studies that used bedrooms as an explanatory variable reported a negative sign associated with that variable. Newly constructed properties (*NewConstruction*) receive a significant discount in our model. Exact location controls – *Latitude* and *Longitude* – are not easily interpretable in an economic manner, although the associated coefficient signs and significance levels support anecdotal reports related to the more desirable living areas in our sample MSA. Of the quality control indicators (*Brick*, *WoodFloor* and *GraniteCounter*), only the entry level quality control, *Brick*, is statistically significant.

Agent specialization proves to be important in our estimation. Sold properties that are listed by an agent that is more highly specialized in listing properties (higher values of *ListAgentListSpecial*) tend to sell at significantly lower prices. Properties sold by a selling

specialist (lower values of *SellAgentListSpecial*), however, tend to sell at higher prices than their counterparts. Our results are directly counter to those offered by Turnbull and Dombrow (2007), and they also stand in opposition to the results proffered by Johnson *et al.* (2007).

The results related to franchise affiliation also reflect interesting outcomes. Employing a franchise-affiliated listing agent (*ListAgentFran*) appears to have no impact on selling price; however, dealing with a franchise-affiliated selling agent (*SellAgentFran*) results in a significantly higher property selling price. An interesting result obtained for agents who manage both the listing and selling functions for the same transaction (*ListAndSell*): these agents achieve lower selling prices in comparison to properties with different listing and selling agent, supporting a finding presented in Turnbull and Dombrow (2007) that cross-firm partnering improves transaction outcomes. Also notable is the result that agent-owned properties (*OwnerBroker*) receive neither a pricing premium nor a pricing discount in our sample.

The coefficient estimate for *QuickSale*, the indicator representing properties with a marketing period of zero days or 1 day, provides perspective on prior studies by Sirmans *et al.* (1995) and Johnson *et al.* (2005). These properties, whose marketing periods are inordinately short and whose brokerage activities may deviate significantly from the norm, tend to sell at significantly higher prices than similar properties with more usual marketing periods. Our result provides support for Johnson *et al.* (2005).

We also examine agent's race and gender. *ListAgentRace* (1 = Nonwhite) indicates that minority listing agents are associated with significantly lower selling prices than their white counterparts,

Table 3. 2SLS estimation results – dependent variable is *SellingPrice*

Variable	Coefficient estimate	SE	<i>t</i> -value	<i>p</i> -value	VIF
<i>Intercept</i>	−922.60	498.57	−1.9	0.06	0.00
<i>Age</i>	−1.72	0.07	−25.1	<0.01	3.15
<i>Age</i> ²	0.01	0.00	12.7	<0.01	2.07
<i>Size</i>	109.56	2.38	46.0	<0.01	3.65
<i>Size</i> ²	−6.63	1.07	−6.2	<0.01	1.86
<i>Bedrooms</i>	−7.76	1.86	−4.2	<0.01	1.99
<i>Bedrooms</i> ²	−4.63	1.33	−3.5	<0.01	1.33
<i>Bathrooms</i>	24.23	2.27	10.7	<0.01	3.00
<i>Bathrooms</i> ²	−1.84	1.33	−1.4	0.16	1.76
<i>NewConstruction</i>	−19.64	2.28	−8.6	<0.01	1.79
<i>Latitude</i>	−0.04	0.59	−0.1	0.94	1.33
<i>Longitude</i>	−1.82	0.76	−2.4	0.02	2.29
<i>Brick</i>	25.84	2.36	11.0	<0.01	1.33
<i>WoodFloor</i>	−2.17	2.50	−0.9	0.39	1.02
<i>GraniteCounter</i>	−2.30	5.15	−0.5	0.65	1.02
<i>ListAgentListSpecial</i>	−24.83	9.39	−2.6	0.01	1.26
<i>SellAgentListSpecial</i>	−13.89	7.62	−1.8	0.07	1.32
<i>ListAgentFran</i>	0.93	2.63	0.4	0.72	1.42
<i>SellAgentFran</i>	5.59	2.66	2.1	0.04	1.44
<i>ListAndSell</i>	−12.05	1.74	−6.9	<0.01	1.16
<i>OwnerBroker</i>	1.23	6.63	0.2	0.85	1.02
<i>QuickSale</i>	9.67	3.09	3.1	<0.01	1.07
<i>ListAgentRace</i>	−31.14	6.20	−5.0	<0.01	1.36
<i>SellAgentRace</i>	−0.76	5.25	−0.1	0.89	1.34
<i>ListAgentGender</i>	−13.35	2.27	−5.9	<0.01	1.51
<i>SellAgentGender</i>	−8.52	2.31	−3.7	<0.01	1.48
<i>Time</i>	38.50	1.73	22.3	<0.01	1.15
<i>ListAgentBeauty</i>	5.24	0.95	5.5	<0.01	1.18
<i>SellAgentBeauty</i>	2.29	0.87	2.6	0.01	1.24
<i>PredDaysOnMarket</i>	−0.27	0.53	−0.5	0.61	2.27
<i>R</i> ²	0.79				
Adjusted <i>R</i> ²	0.78				
<i>F</i> -statistic	459.6***				
<i>N</i>	3656				

Notes: This table reports the results of the White-corrected 2SLS model of selling price (*SellingPrice*). *Size* is the structure's size in square feet. *ListAgentListSpecial* indicates the level of listing specialization by a particular property's listing agent, while *SellAgentListSpecial* indicates the level of listing specialization by a particular property's selling agent. *ListAndSell* indicates that the same agent both listed and sold the property in question. *OwnerBroker* indicates that the property seller was a real estate agent. *QuickSale* indicates that the property has a listed time on the market of zero days or 1 day. *ListAgentBeauty* is the average rating of the listing agent's beauty as rated by our survey respondents. *SellAgentBeauty* is the average rating of the selling agent's beauty as rated by our survey respondents. The major result is that more attractive listing agents and more attractive selling agents are associated with higher selling prices.

*** Indicates significance at 0.01 level.

while selling agent's race (*SellAgentRace*) appears not to have a significant impact on transaction prices. Gender, however, plays a significant role in our sample for both types of agents. Male listing agents (*ListAgentGender* = 1) and male selling agents (*SellAgentGender* = 1) affect lower transaction prices than their female counterparts. There is a distinct difference in the magnitude of the statistical effect across agent types; gender affects listing agents more than selling agents. Both of these outcomes provide

alternative evidence to the results presented by Turnbull and Dombrow (2007).

Finally, we turn to our variables of interest, the beauty scores from our survey. In both cases (*ListAgentBeauty* and *SellAgentBeauty*) an agent's physical attractiveness leads to higher transaction prices. These results suggest that beauty can have a positive effect on an agent's income, because the agent's commission is most often based on transaction price. It is interesting to note, however, that the

Table 4. 2SLS estimation results – dependent variable is *DaysOnMarket*

Variable	Coefficient estimate	SE	t-value	p-value	VIF
<i>Intercept</i>	-495.00	571.35	-0.9	0.39	0.00
<i>Age</i>	0.23	0.13	1.8	0.07	4.10
<i>Age</i> ²	-0.00	0.00	-0.2	0.88	2.62
<i>Size</i>	0.02	0.00	4.1	<0.01	4.45
<i>Size</i> ²	-0.00	0.00	-0.9	0.37	2.04
<i>Bedrooms</i>	-4.23	3.19	-1.3	0.18	2.20
<i>Bedrooms</i> ²	-1.83	1.90	-1.0	0.33	1.40
<i>Bathrooms</i>	12.09	3.89	3.1	<0.01	3.53
<i>Bathrooms</i> ²	-0.40	2.04	-0.2	0.85	1.73
<i>NewConstruction</i>	11.15	4.34	2.6	0.01	1.96
<i>Latitude</i>	1.23	1.02	1.2	0.23	2.02
<i>Longitude</i>	-0.95	0.68	-1.4	0.16	2.73
<i>Brick</i>	-9.85	3.79	-2.6	0.01	1.39
<i>WoodFloor</i>	5.58	4.78	1.2	0.24	1.02
<i>GraniteCounter</i>	22.98	8.34	2.8	0.01	1.10
<i>ListAgentListSpecial</i>	49.38	18.17	2.7	0.01	1.40
<i>SellAgentListSpecial</i>	1.93	14.13	0.1	0.89	1.42
<i>ListAgentFran</i>	-9.81	4.88	-2.0	0.04	1.56
<i>SellAgentFran</i>	-6.11	4.79	-1.3	0.20	1.62
<i>ListAndSell</i>	-0.05	3.13	0.0	0.99	1.19
<i>OwnerBroker</i>	-27.84	11.99	-2.3	0.02	1.07
<i>QuickSale</i>	-87.86	5.50	-16.0	<0.01	1.07
<i>ListAgentRace</i>	46.44	12.93	3.6	<0.01	1.19
<i>SellAgentRace</i>	18.07	8.83	2.1	0.04	1.21
<i>ListAgentGender</i>	6.74	4.14	1.6	0.10	1.72
<i>SellAgentGender</i>	1.53	4.23	0.4	0.72	1.67
<i>Time</i>	-65.85	3.67	-18.0	<0.01	1.24
<i>ListAgentBeauty</i>	9.78	1.75	5.6	<0.01	1.28
<i>SellAgentBeauty</i>	0.47	1.63	0.3	0.77	1.33
<i>AtypicalPrice</i>	209.25	114.34	1.8	0.07	3.06
<i>R</i> ²	0.18				
Adjusted <i>R</i> ²	0.17				
<i>F</i> -statistic	24.8***				
<i>N</i>	3303				

Notes: This table reports the results of the White-corrected 2SLS model of time on the market (*DaysOnMarket*). *Size* is the structure's size in square feet. *ListAgentListSpecial* indicates the level of listing specialization by a particular property's listing agent, while *SellAgentListSpecial* indicates the level of listing specialization by a particular property's selling agent. *ListAndSell* indicates that the same agent both listed and sold the property in question. *OwnerBroker* indicates that the property seller was a real estate agent. *QuickSale* indicates that the property has a listed time on the market of zero days or 1 day. *ListAgentBeauty* is the average rating of the listing agent's beauty as rated by our survey respondents. *SellAgentBeauty* is the average rating of the selling agent's beauty as rated by our survey respondents. The major result is that more attractive listing agents are associated with longer time on the market, while more attractive selling agents are associated with neither extension nor shortening of time on the market.

*** Indicates significance at 0.01 level.

effect of a marginal improvement in perceived beauty is more than twice as large for a listing agent as for a selling agent. We discuss our total interpretation of this result in the summary remarks that end this section.

Time on market model

The results of the core variables in the time on market model generally support the results of the pricing

model and our expectation. Older properties (*Age*), larger properties (*Size*), and properties with more bathrooms (*Bath*) all exhibit longer marketing periods. *Bedrooms* is predicted to neither reduce nor extend the time on the market. Interestingly, newly constructed properties (*NewConstruction*) are predicted to extend time on market. Two quality variables affect marketing time. Brick siding (*Brick*) shortens the marketing period, while the top level quality control *GraniteCounter* extends marketing time significantly.

Brokerage variables are again interesting. Listing specialists (higher values of *ListAgentListSpecial*) are associated with extended marketing periods, and selling specialists (lower values of *SellAgentListSpecial*) appear to have no impact on marketing time. Franchise status affects time on the market in a significant manner for listing agents but not for selling agents. Franchise listing agents (*ListAgentFran*) produce significantly shorter listing periods; coupled with our previous discussion, it seems that franchise-affiliated listing agents may, in fact, be pricing properties at or very near the market price, causing them to sell at shortened marketing times. Examining the inverse situation illustrates that non-franchise-affiliated listing agents achieve neither higher selling prices nor shortened marketing periods for their sellers. Thus, franchise affiliation must provide a benefit, and that benefit may very well take the form of increased buyer traffic to the franchise office, shortening *DaysOnMarket*. We examine this situation further in our aggregate models.

While properties with the same listing and selling agent (*ListAndSell*) receive a discount in the pricing model, there is no evidence that this brokerage outcome shortens the marketing period. However, properties owned by an agent (*OwnerBroker*) sell at a significantly reduced time on market. Race and gender again provide interesting results. Nonwhite listing agents (*ListAgentRace* = 1) and nonwhite selling agents (*SellAgentRace* = 1) are associated with extended time on the market. However, male listing agents produce neither an extension nor a contraction of marketing time. Turning to our variables of interest, *ListAgentBeauty* and *SellAgentBeauty*, we find that being perceived as more attractive actually extends marketing when serving as a listing agent, while beauty seems to have no effect on time on market for selling agents. As a side note, properties that are priced atypically (*AtypicalPrice*) exhibit longer *DaysOnMarket*, supporting the results of Haurin (1988).

Discussion

Synthesizing the pricing and time on the market model outcomes reveals several interesting points regarding our brokerage characteristic results. We begin with the results of franchise affiliation. We conjecture that the franchise results are related to the nature of the work done by listing and selling agents. One has only to examine the differing situations facing buyers and sellers to understand the outcome. Sellers almost always reside in the community in which the property is located. Thus, they have specific knowledge of local agents

who are successful (or who specialize) in listing properties. Franchise affiliation is discounted in this instance, since familiarity outweighs the need for advertising; for example, the seller may be familiar with a particular listing agent through a religious or social organization. For buyers, however, the problem is quite different. Often, a buyer is unfamiliar with the local real estate market and, in fact, the local community at large. In that instance, the buyer is more likely to rely on advertising or national branding, two factors closely tied to franchise status. Hence, we may expect that there is a higher probability that listing agents would avoid paying franchise fees that might be deemed unnecessary. Under this scenario, a listing specialist (i.e. an agent who focuses solely or almost solely on listing properties) uses his or her local reputation to draw sellers without regard for the selling-end considerations; in other words, the listing specialist takes the listing, enters it into the local MLS, and then leaves the market to clear via other agents affiliated with the MLS.

Now consider a listing agent who is affiliated with a franchise. Based on the argument above, the franchise office will consist partly of selling agents who are seeking business through the franchise's advertising effect. Thus, for a given listing contract that is initiated in the franchise firm, it is logical to assume that there will be more buyers presenting themselves than for an identical listing at a nonfranchise firm. If we assume that such advertising is a signal of a better selling agent (i.e. the agent is intelligent or shrewd enough to identify the benefits of the franchise), then it is logical to conclude that the additive effects of a franchise listing agent and a franchise selling agent would be an increased selling price (from the selling agent) and decreased marketing time (from the listing agent) to the seller. In essence, this is the outcome from our pricing and time on the market models.

Further, if one views the role of the listing agent as initiating the pricing process at a value that is the highest that the market will bear in order to achieve a closing and if the listing agent is competent, then we should expect no significant pricing effect across listing agents, regardless of franchise affiliation. Likewise, if one views the selling agent (who works to achieve the highest possible transaction price) as competent, then one should expect that the selling agent would market the property to its highest level and would support the seller's desire to maximize selling price. In short, if we expect that productivity-related characteristics of salesmanship, etc., play a much larger role for selling agents than for listing agents, then it is a successful selling agent who will actively sell the property at a higher price, rather than

passively allow the property to be bought at a lower price. We note that Turnbull and Dombrow (2007) suggest that listing agents achieve higher selling prices while selling agents reduce the transaction price. Our results and our rationale suggest that the opposite is true for franchise affiliates.

We next turn our attention to cases in which the same individual serves as both the listing agent and the selling agent (*ListAndSell*). The explanation for the pricing effect is straightforward; when the listing agent and the selling agent are the same individual, there is no sharing of commission other than that required by the agent's compensation arrangement with his or her firm, and the individual's incentive to maximize selling price is reduced (assuming that nonsatiation with regard to utility of wealth is strictly local, and not global, in nature). Based on our empirical analysis, we conclude that having the same individual serve as both the listing agent and the selling agent has no benefit to the seller whatsoever.

A third interesting brokerage outcome is the result of agent-owned properties. We find no pricing impact and a significant shortening of the marketing period. This result is directly counter to the evidence offered by Rutherford *et al.* (2007) and the suggestion made by Levitt and Dubner (2005). We conclude that our results indicate that agents in our sample area are not necessarily 'cheating' their clients as suggested by Rutherford *et al.* (2007). We suggest that agents simply follow their own advice perfectly, leading to a superior marketing outcome. In other words, there are no agency costs in this situation. Such cannot reasonably be attributed to nonagent sellers in practice, because sellers often form badly-informed priors regarding property value before consulting a listing agent, and these priors often affect the marketing process negatively.

Fourth, our examination of race and gender provides evidence that both race and gender play a role in our sample MSA's brokerage activities. Minority listing agents are associated with discounted selling prices, and both minority listing agents and minority selling agents are associated with extended marketing times. From our analysis, it is clear that minority listing agents are associated with suboptimal outcomes; however, we cannot attribute this to the individual agents' capabilities, since the properties these agents list may differ from the properties listed by nonminority agents. The situation regarding minority selling agents is less clear. Unfortunately, our sample does not allow for an examination of selection bias along these lines.

Finally, we examine beauty and its effect on selling price and time on the market. More attractive listing

agents are associated with higher selling prices and extended marketing times, while more attractive selling agents are associated with higher selling prices only. In terms of our theory, it appears that more attractive listing agents are using one of two likely strategies: (a) using their attractiveness to fuel a passive listing specialist form of business, thereby using beauty to supplement productivity-related characteristics or (b) using their attractiveness to complement their productivity-related characteristics, making use of their beauty to attract listings because they otherwise lack the means to use their beauty to sell properties. In other words, this second outcome is based on the idea that listing agents and selling agents differ in their skill sets, regardless of beauty. Likewise, it seems that more attractive selling agents possess skill sets that are not significantly worse than (and potentially better than) their less attractive counterparts and that beauty is complementing their other production-related characteristics to produce a clearly superior outcome. Our aggregate, agent-level analysis will provide more information regarding this question.

Aggregate agent-level models

Let us consider again the methods in which an agent may be more productive. If we define productivity as generating higher revenues, then the avenues to higher productivity are two: greater quantity of transactions or a higher price per transaction (and thus a higher commission, all else equal). We examine, then the number of listings taken by each agent, the number of sales completed by each agent, and the average dollar value per listing sold and the average dollar value per sale for each agent as a per-unit metric of productivity. Table 5 presents the results of these aggregated agent-level models. The models are all appropriately fitted based on the *F*-statistics displayed in Table 5. We discuss only the impact of the agent's beauty score (*Beauty*) on each respective dependent variable.

Model A represents the regression of the number of listings (*NumberListings*) on the four recurring explanatory variables. Model A demonstrates that *Beauty* is inversely related to *NumberListings*; more attractive agents take fewer listings than less attractive agents do. Model B provides a similar model for the number of sales (*NumberSales*). Again, beauty is negatively related to transactions, as more attractive agents complete fewer sales than their counterparts. In terms of quantity of transactions, it appears that more attractive agents are clearly involving themselves in fewer transactions than less attractive agents are. This result rules out the first avenue to higher

Table 5. Regression results – agent-level data^a

Variable	Model A <i>NumberListings</i>		Model B <i>NumberSales</i>		Model C <i>DollarsPerListing</i>		Model D <i>DollarsPerSale</i>	
	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic
<i>Intercept</i>	2.28	0.1	61.61***	3.8	91 362.00***	4.3	123 716.00***	6.0
<i>Race</i>	-30.34*	-1.8	-22.23**	-2.1	-41 338.00***	-3.1	-37 272.00***	-2.8
<i>Gender</i>	-11.52	-1.2	-13.22**	-2.2	-14 459.00*	-1.8	-10 680.00	-1.4
<i>Franchise</i>	10.74	1.0	8.89	1.3	4544.12	0.5	14 232.00*	1.7
<i>ListingSpecialist</i>	138.98***	4.1	-11.26	-0.5	17 786.00	0.7	-30 679.00	-1.2
<i>Beauty</i>	-9.20**	-2.5	-5.89**	-2.6	10 989.00***	3.8	8467.33***	3.0
<i>R</i> ²	0.22		0.14		0.25		0.24	
Adjusted <i>R</i> ²	0.18		0.10		0.22		0.20	
<i>F</i> -statistic	5.5***		3.3***		6.6***		6.1***	
<i>N</i>	104		104		104		104	

Notes: *NumberListings* is the total number of listings taken by an agent. *NumberSales* is the total number of sales taken by an agent. *DollarsPerListing* is the average value of an agent's listings that were sold in the sample period. *DollarsPerSale* is the average value of an agent's sales in the sample period. *Race* is the agent's race (White = 0, Nonwhite = 1). *Gender* is the agent's gender (Female = 0, Male = 1). *Franchise* indicates franchise affiliation. *ListingSpecialist* indicates the agent's degree of listing specialization, with the number of listings taken over the study period calculated as a percentage of the total number of an agent's transactions. *Beauty* is the agent's average rating of the agent's beauty as rated by our survey respondents.

^aDependent variable is listed under head of each column.

***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

productivity; if beauty does affect productivity positively – and the results of our transaction-level analyses indicate that it does – then it must be the case that more attractive agents generate a higher dollar value per transaction than their counterparts, thus using the second avenue.

Model C presents the regression of *DollarsPerListing* on *Race*, *Gender*, *Franchise*, *ListingSpecialist* and *Beauty*. We see that an agent's beauty score is a positive and statistically significant predictor of the number of dollars per listing sold. As a similar estimate, Model D fits *DollarsPerSale* to the four explanators, and again more attractive agents are shown to achieve a higher dollar value for each closing. Thus, at an aggregate (macro) level, more attractive agents are indeed more productive than their less attractive counterparts, and this increased productivity is clearly not related to production scale. It follows, then, that the productivity boost must be rooted in superior productivity-related characteristics and/or beauty. Providing support for our previous investigations of race, we see in Table 5 that minority agents are associated with lower numbers of listings and sales and a lower transaction value for both listings and sales.

Reconciliation of empirical results and theory

Recalling Equation 6, we see that

$$W_i = a\varepsilon X_{Li} + b\theta_i + cF_i + \alpha(1 - \varepsilon)X_{Si} + \beta\theta_i + \gamma F_i \quad (9)$$

The primary purpose of this study is to provide insight into the nature of b and β , the effects of beauty on per-transaction listing and selling activities, respectively. Our results indicate that listing agent beauty increases selling prices but extends time on the market, creating an indeterminate effect on the present value of the wage, so we cannot make a definitive statement about b . However, we can assume that for listing agents who are immersed in listing activities – and, therefore, have created a pipeline of for-sale properties that mitigates cash flow timing issues – beauty is either neutral or positive in its effect on agent wage. The results for selling agents, however, are clear: beauty results in higher selling prices with no extension of marketing time. Thus, β has a positive effect on wage, all else equal. We conclude, then, that an agent's beauty has a slight positive effect on listing activities and a clearly positive effect on selling activities. This outcome fits with our understanding of the nature of the two types of agent activities as discussed in previous sections.

Of secondary interest is the effect of franchising on listing (c) and selling (γ) activities. In both cases, franchise affiliation seems to have an overall positive effect on both types of activities. Franchise affiliated listing agents seem to benefit from shortened marketing periods with no decrease in selling price, while franchise selling agents seem to produce higher selling prices with no increase in marketing time. Hence, we conclude that franchise affiliation affects both transaction types in a positive manner. In a present value

sense, franchise affiliation improves the wage for both listing and selling agents.

Third, it appears that the degree of specialization (ε) has the potential to affect agent wages. A higher degree of listing specialization ($\varepsilon \rightarrow 1$) for the listing agent is associated with lower transaction prices and longer time on the market, so that at a transaction level, specialization in listings reduces agent wages. Thus, listing agents must rely on scale to mitigate this factor, and we see exactly that result in our agent-level aggregated, Table 5, Model A. Conversely, a selling agent that specializes in sales ($\varepsilon \rightarrow 0$) achieves a higher transaction price with no significant increase in time on the market; selling specialization increases agent wages at the transaction level, although this is mitigated by the decreased scale from Table 5, Model A.

One immediate concern might be raised regarding the correlation between beauty and other productive characteristics. In specific, one could argue that beauty is highly correlated with other productive capabilities and that more attractive individuals are inherently more likely to be more intelligent (Kanazawa and Kovar, 2004) or more talented. While we cannot feasibly measure characteristics that would proxy the intelligence, education level, or self-confidence of the agents studied in our empirical analysis, we can refer to numerous studies that reference the so-called 'halo effect', in which more attractive individuals are expected, *ex ante*, to possess greater intelligence or capability, producing an upward intelligence or ability bias in favour of the more attractive.⁶ In addition, Biddle and Hamermesh (1998) provide a statement regarding the relationship between beauty and other nonbeauty factors:

It may also be argued that the beauty coefficients in the earnings regressions capture a correlation between beauty and other productivity-enhancing characteristics that have been omitted from the equations. Concerns about omitted-variables bias are mitigated considerably by our inclusion of a very rich set of measures correlated with ability, including undergraduate performance, class rank in law school, participation in moot-court competitions and law journals, and firm size.... A general reading of the [regression] evidence..., however, leaves little room for inferring that there is much correlation between beauty and pre-labor-market indicators of ability. (p. 188)

⁶ See, for example, Feingold (1992), Jackson *et al.* (1995), and Zebrowitz *et al.* (2002) for establishment of the 'halo effect'.

While the Biddle and Hamermesh (1998) correlations would almost certainly not strictly hold for beauty-driven professions (e.g. acting, modelling), we find it reasonable to conclude that correlations would apply across a wide spectrum of professions that do not rely specifically on beauty (e.g. medicine, engineering, sculpture, music, academia) and that this spectrum would include real estate.

V. Conclusion

An individual real estate agent's beauty has an effect on that agent's productivity and, therefore, his or her wage. The effect manifests itself in different ways for listing agents and for selling agents. Analysis of transaction-level data indicates that more attractive listing agents are associated with higher selling prices but extended time on the market (and thus a price/time tradeoff) when compared to their less attractive counterparts, while more attractive selling agents produce higher transaction price outcomes with no extension of marketing time. Given the nature of the brokerage system, this confirms our theory that beauty enhances an agent's wage. Further analysis of agent-level data indicates that more attractive agents are involved in fewer transactions than less attractive agents are; however, beauty has a positive effect on the average dollar value per transaction, indicating that agents with higher levels of perceived beauty are associated with higher transaction values and, therefore, higher wages on a per-transaction basis. Taken together, our results also suggest that more attractive agents may be using beauty to supplement, rather than to complement, other productive activities.

Acknowledgements

The authors thank an anonymous referee of this journal and various participants at the 26th Annual American Real Estate Society Meetings (Naples, 2010) for helpful comments. The usual caveat applies.

References

- Anglin, P. M. (1997) Determinants of buyer search in a housing market, *Real Estate Economics*, **25**, 567–89.
- Anglin, P. M., Rutherford, R. C. and Springer, T. M. (2003) The trade off between the selling price and

- time-on-the-market: the impact of price setting, *Journal of Real Estate Finance and Economics*, **26**, 95–111.
- Arnold, M. A. (1999) Search, bargaining, and optimal asking prices, *Real Estate Economics*, **27**, 453–81.
- Becker, G. S. (1985) Human capital, effort and the sexual division of labor, *Journal of Labor Economics*, **3**, 33–58.
- Biddle, J. E. and Hamermesh, D. S. (1998) Beauty, productivity and discrimination: lawyers' looks and lucre, *Journal of Labor Economics*, **16**, 172–201.
- Colwell, P. F. and Marshall, D. W. (1986) Market share in the real estate brokerage industry, *AREUEA Journal*, **14**, 583–99.
- Durbin, J. and Watson, G. (1950) Testing for serial correlation in least squares regression – I, *Biometrika*, **37**, 409–28.
- Feingold, A. (1992) Good looking people are not what we think, *Psychological Bulletin*, **111**, 304–41.
- Frew, J. R. and Jud, G. D. (1986) The value of a real estate franchise, *AREUEA Journal*, **14**, 374–83.
- Glower, M., Haurin, D. R. and Hendershott, P. H. (1998) Selling price and selling time: the impact of seller motivation, *Real Estate Economics*, **26**, 719–40.
- Hamermesh, D. S. and Biddle, J. E. (1994) Beauty and the labor market, *American Economic Review*, **84**, 174–94.
- Hamermesh, D. S., Meng, X. and Zhang, J. (2002) Dress for success: does primping pay?, *Labour Economics*, **9**, 361–73.
- Hamermesh, D. S. and Parker, A. M. (2005) Beauty in the classroom: instructor's pulchritude and putative pedagogical productivity, *Economics of Education Review*, **24**, 369–76.
- Haurin, D. (1988) The duration and marketing time of residential housing, *Journal of the American Real Estate and Urban Economics Association*, **16**, 397–410.
- Jackson, L. A., Hunter, J. E. and Hodge, C. N. (1995) Physical attractiveness and intellectual competence: a meta-analytic review, *Social Psychology Quarterly*, **58**, 108–22.
- Johnson, K. H., Springer, T. M. and Brockman, C. M. (2005) Price effects of non-traditionally broker-marketed properties, *Journal of Real Estate Finance and Economics*, **31**, 331–43.
- Johnson, K. H., Zumpano, L. V. and Anderson, R. I. (2007) Listing specialization and residential real estate licensee income, *Journal of Real Estate Research*, **29**, 75–89.
- Kanazawa, S. and Kovar, J. L. (2004) Why beautiful people are more intelligent, *Intelligence*, **32**, 227–43.
- Kutner, M., Nachtsheim, C. and Neter, J. (2004) *Applied Linear Regression Models*, McGraw-Hill/Irwin, New York.
- Levitt, S. D. and Dubner, S. J. (2005) *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*, Harper Collins, New York.
- Lewis, D. and Anderson, R. (1999) Residential real estate brokerage efficiency and the implications of franchising: a Bayesian approach, *Real Estate Economics*, **27**, 543–60.
- Miller, N. (1978) Time on the market and selling price, *AREUEA Journal*, **6**, 164–74.
- Munneke, H. J. and Yavas, A. (2001) Incentives and performance in real estate brokerage, *Journal of Real Estate Finance and Economics*, **22**, 5–21.
- Pfann, G. A., Biddle, J. E., Hamermesh, D. S. and Bosman, C. M. (2000) Business success and businesses' beauty capital, *Economics Letters*, **67**, 201–7.
- Rutherford, R. C., Springer, T. M. and Yavas, A. (2007) Evidence of information asymmetries in the market for residential condominiums, *Journal of Real Estate Finance and Economics*, **35**, 23–38.
- Sirmans, G. S., MacPherson, D. and Zietz, E. N. (2005) The composition of hedonic pricing models, *Journal of Real Estate Literature*, **13**, 3–43.
- Sirmans, C. F., Turnbull, G. K. and Dombrow, J. (1995) Quick house sales: seller mistake or luck?, *Journal of Housing Economics*, **4**, 230–43.
- Turnbull, G. K. and Dombrow, J. (2007) Individual agents, firms, and the real estate brokerage process, *Journal of Real Estate Finance and Economics*, **35**, 57–76.
- White, H. (1980) A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica*, **48**, 817–38.
- Yavas, A. (1992) A simple search and bargaining model of real estate markets, *Journal of the American Real Estate and Urban Economics Association*, **20**, 533–48.
- Yavas, A. and Yang, S. (1995) The strategic role of listing price in marketing real estate: theory and evidence, *Real Estate Economics*, **23**, 347–68.
- Zebrowitz, L. A., Hall, J. A., Murphy, N. A. and Rhodes, G. (2002) Looking smart and looking good: facial cues to intelligence and their origins, *Personality and Social Psychology Bulletin*, **28**, 238–49.

Appendix: Sample Survey Instrument Question

The following image represents the type of instrument used to gather an agent's beauty score. Each survey page contained a 'head shot'

photographic image taken from the agent's Internet website. Images were edited to ensure general uniformity of size and presentation. The respondents rated each agent using a scale of 1 to 10, as described in the representative page (below).

Consider this photo when answering the following question.



Using a scale of 1 to 10 with 1 = 'Very Unattractive' and 10 = 'Very Attractive,' indicate your evaluation of this individual's Physical Attractiveness (or Beauty) based on the photo above.

1 2 3 4 5 6 7 8 9 10

Notes: The individual depicted in the representative page is not a real estate agent in our sample. She is, in fact, Genevieve Gorder, who has appeared on several television series, including The Learning Channel's (TLC) *Trading Spaces* and, more recently, Home and Garden Television's (HGTV) *Dear Genevieve*. Ms. Gorder's image is taken from the World Wide Web and is used solely to depict the type of image used in our survey without compromising an actual agent's identity.