

The effects of firm size on wages in Colorado: a case study

A unique data set from Colorado's Job Vacancy Surveys provides a wealth of employer-reported information including a wage range for jobseekers and a way to examine the effects of firm size on various job vacancy characteristics

Paul Paez

Information on firm size and an employer's willingness to pay more for higher levels of education and experience are of value to jobseekers looking for their highest potential salary in today's labor market. The Job Vacancy Surveys, conducted in Colorado by its Department of Labor and Employment, help jobseekers, labor market analysts, economists, and many others by providing information on the amount and types of jobs that are available and the qualifications that employers demand for those jobs. Data from the survey allow analysts to report the proportion of job vacancies and the average wages offered, with respect to vacancy characteristics, throughout the State. The survey also provides data on the wage range that employers are willing to pay the individual who is eventually hired.

Also of value to jobseekers is the knowledge that larger firms pay higher wages. Economists and sociologists have postulated many theories to explain this positive relationship since first reported in 1911.¹

This article uses the abundant unique data set provided by Job Vacancy Surveys to explore the relationship between firm size, job vacancy needs and employers' wage offers in the Colorado Front Range. Similar to other research, this study finds that Colorado's large firms offered higher wages to fill vacancies than smaller firms with otherwise similar institutional characteristics and requiring the same levels of

both education and experience.

The size-wage premium

In 1989, Charles Brown and James Medoff used a number of data sets to investigate possible explanations for the size-wage premium.² Their research concludes that the size-wage premium is "sizeable and omnipresent" and not sufficiently explained by existing theories. Brown and Medoff categorize the various size-wage premium theories as either neoclassical or institutional. Neoclassical explanations include the labor quality hypothesis, the efficiency wage explanation, and the theory of compensating wage differentials. The monopoly power explanation, and the unionization avoidance hypothesis are examples of institutional explanations.

The labor quality hypothesis states that large firms tend to hire more skilled workers. A variety of explanations for this theory have been presented. One theory suggests that large firms employ high-skilled managers who tend to surround themselves with similarly high-skilled employees. A related theory proposes that large firms are more capital intensive and require skilled workers to operate the firms' complex machinery. Another explanation that has been suggested also relates to management. The efficiency wage explanation posits that there is a trade-off between wages and work intensity. The

Paul Paez is an economist at the Colorado Department of Labor and Employment.

larger a firm becomes, the more difficult it is for managers to monitor employees. As a result, employees are more likely to shirk their duties. Firms offer higher wages as an incentive for employees to work harder as an alternative to hiring more managers to monitor employees.

The theory of compensating wage differentials generally refers to the need for employers to offer higher wages in order to attract qualified workers when working conditions are undesirable. Less flexible scheduling, inefficient hierarchies, more rigid regulation, entrepreneurial discouragement, and an impersonal work environment are all examples of undesirable characteristics often associated with large firms.

Institutional explanations include the suggestion that large firms often have greater market power and gain monopoly rents, which they share with employees. Alternatively, nonunion, large firms may offer union-like compensation packages as a deterrent to worker unionization.

To the extent that statistical data measure the relevant worker/firm characteristics, if any of the explanations hold, adding variables to control for these characteristics to a wage-size regression should eliminate the effect of firm size on wages. Recent research in this area has found that employer size-wage premiums remain largely unexplained.³ Using a variety of human capital and institutional variables, this article investigates the influence of firm size on wages offered by Colorado employers to fill vacant positions.

Job Vacancy Surveys

In 1999, the Colorado Department of Labor and Employment (Colorado Labor Department or Department, for short) received one of six grants issued by the U.S. Department of Labor Employment and Training Administration to conduct a pilot study to determine the feasibility of measuring employers' demand for labor through a Job Vacancy Survey. In cooperation with Arapahoe/Douglas Works,⁴ the Colorado Labor Department conducted and issued a report based on the original Denver Metro Job Vacancy Survey. The report was so well received in Colorado that subsequent Denver Metro surveys were conducted and the decision was made to expand the report throughout the entire State. In April 2001, the Department set up its own survey unit to collect the necessary vacancy data. Using Computer Assisted Telephone Interview (CATI) technology, the survey unit was able to collect sample data covering all 11 of the State's Job Vacancy Survey regions by the end of 2001, a period of just 9 months! During those 9 months, the Department contacted approximately 30 percent of all Colorado employers with at least five employees.

During the telephone interview, employers are asked how many workers they currently employ as well as how many positions they were actively recruiting to fill at the time of the

survey. The ratio of vacancies to employment, or the job vacancy rate, is then used to estimate the total number of vacancies in the region.⁵ In addition to this basic information, employers that report having vacancies are asked a number of questions about those vacancies. For example, they are asked to provide the job status (that is, full-time, part-time, permanent, or temporary); a job title; and a description of the work performed by the position (to assist in classifying job vacancies by codes based on the Standard Occupational Classification). Employers also are asked to provide a wage range that they are willing to pay the individual who eventually fills the position, as well as what levels of education and experience they require of an applicant in order to be considered.⁶ The employers are asked to choose from a list of six education levels and four experience levels, which best describe the applicant they are seeking. (An underlying assumption of this analysis is that the lower end of the reported wage range is associated with the education and experience requirements reported by the employer and that higher wages may be available to applicants exceeding these requirements.) Employers are also asked whether prospective employees are offered a sign-on bonus⁷ or a medical insurance. Those employers offering to supply access to a medical insurance plan also are asked whether they pay any, part, or all of the insurance premium associated with the plan. In addition to these questions regarding compensation and human capital, employers are asked to choose among three categories (not, somewhat, and very) the level of difficulty that they experience in hiring for the particular type of occupation as well as the amount of time the company has been actively recruiting to fill the vacant position.⁸

The size of the labor force and unemployment rate provide Colorado citizens with an accurate picture of the current labor supply situation, however, they do not provide any detailed information about the skills and knowledge that the labor pool commands nor the industry or occupations for which available workers are qualified to work. The Job Vacancy Survey fills this void by providing useful, timely data regarding the demand for labor by Colorado employers.

This article offers additional analysis of those data. Using ordinary least squares regression/ANOVA techniques, the results found here provide useful wage data by each of the vacancy characteristics included, holding all other characteristics constant. This adds to the analysis provided by the Colorado Department of Labor and Employment because it means that the wage differential associated with a particular firm size, for example, is calculated holding education, experience, and so forth, constant.

The Front Range sample

The four Job Vacancy Survey regions investigated in this

article constitute what is commonly referred to as Colorado's Front Range, reflecting their proximity to the foothills of the Rocky Mountains. The regions, from north to south, are the Larimer/Weld region, the Denver Metro region, the Pikes Peak region, and the Pueblo region. The Larimer/Weld region consists of Larimer and Weld counties. Each county borders Wyoming and each contains a Metropolitan Statistical Area (MSA). Fort Collins is in Larimer County and Greeley is in Weld County. The population of this region is approximately 430,000. The Denver Metro region includes Adams, Arapahoe, Boulder, Denver, Douglas, and Jefferson counties. This region also contains two MSA's; Denver and Boulder. It has the highest concentration of employers in the State and a population of more than 2.3 million. El Paso and Teller counties make up the Pikes Peak region with a population of slightly more than half a million. The Pueblo County region is 1 of only 2 one-county Job Vacancy Survey regions in the State and the smallest of the Front Range regions with slightly fewer than 150,000 residents.

More than half of the firms in each of the four Front Range Job Vacancy Survey regions are classified as either Services or Retail Trade industries. Although government agencies make up only a small proportion of employers in each region, they rank highly in terms of numbers employed. Unemployment rates ranged from 2.6 percent in Teller County to 4.7 percent in Pueblo and El Paso Counties at the time of the surveys. Seasonal employment in each region peaks in late summer and slows in the middle of winter. The surveys used in this article were conducted in periods of peak seasonal employment. (See table 1.)

Between July 31, and November 19, 2001, more than 8,000 employers were contacted in the four Front Range Job Vacancy Survey regions. Those employers reported having nearly half-a-million workers at the time of the surveys as well as actively recruiting to fill an additional 8,605 vacant positions. Upon completion of the surveys, the Colorado Labor Department issued summary reports for each region.⁹ In these reports, the proportion of vacancies as well as the average wage range associated with each category of the vacancy characteristics surveyed is provided.

Table 1. Front Range Job Vacancy Survey description, 2001

Front Range area	Start date	End date	Number of employers contacted	Employment represented
Total Front Range	1/1/01	11/19/01	8,371	483,831
Larimer/Weld	10/8/01	11/6/01	1,960	91,605
Denver Metro	10/23/01	11/19/01	3,141	253,462
Pikes Peak	7/31/01	9/7/01	2,185	102,873
Pueblo County	9/6/01	9/24/01	1,085	35,891

SOURCE: Job Vacancy Surveys, Colorado Department of Labor and Employment, 2001.

The overall average wage offered in the Denver Metro region was the highest of the four Front Range regions, followed by Larimer/Weld, Pikes Peak, and Pueblo County respectively. What constitutes a large firm varies from one region to the next. For the purpose of the Job Vacancy Survey, the Colorado Labor Department defines large firms as those accounting for approximately one third of the region's total, private sector employment in firms with at least five workers.¹⁰ Large firms in each of the four Front Range Job Vacancy Survey regions are defined as: those employing at least 250 employees in Denver Metro, 200 employees in Pikes Peak and Pueblo County, and 150 employees in Larimer/Weld. In each region, the wages reported by large firms were higher than those offered by small to mid-size firms. With few exceptions, the reported wage ranges in each survey increased along with measures of both education and experience. Jobseekers who are hired for full-time, permanent positions were offered the highest wages among the employment statuses in all four surveys. Those vacancies offering the highest wages also offered additional compensation: in each survey, the reported wage ranges increased along with the employer's contribution to the medical insurance premium. The wages offered by both industry and occupational classification varied from one region to the next.

Employers supplied characteristic information for 4,015 vacancies reported in the four Front Range Job Vacancy Survey regions.¹¹ Table 2 summarizes these characteristics for each of the Front Range regions.

Analysis of the variance

This study compares wages offered by employers to fill open positions in each of the four Colorado Front Range Job Vacancy Survey regions. The differential effects of firms size on average wages offered are estimated holding human capital and institutional vacancy characteristics constant. The regression used to test for the differential affects of each of these characteristics is:

$$\begin{aligned}
 \ln ENTRYOFFER_i &= \alpha + \beta_1 SIZ_{i1} + \sum_{j=1}^3 \alpha_j LOC_{ij} + \sum_{k=1}^5 \beta_k EDU_{ik} + \sum_{l=1}^3 \delta_l EXP_{il} + \sum_{m=1}^7 \gamma_m IND_{im} \\
 &+ \sum_{n=1}^4 \theta_n OCC_{in} + \lambda_1 TEMP_i + \sum_{o=1}^3 \rho_o INS_{io} + \sum_{p=1}^2 \eta_p OUT_{ip} + \epsilon_i
 \end{aligned}
 \quad (1)$$

where *ENTRYOFFER* is the natural logarithm of the minimum of the wage range offered by an employer for the vacancy, *i* indexes each of the vacancies, α represents the baseline¹² average entry-level wage offered, ϵ is an independent identically distributed random variable with mean 0, and the explanatory variables are described in exhibit 1. The indicator variables representing education, experience, and employer's contribution to medical insurance are included to control for wage variations dependent on measures of human capital.¹³

Table 2. Summary of vacancy characteristics by Colorado Front Range Job Vacancy Survey region, 2001

Characteristic	Larimer/ Weld	Denver Metro	Pikes Peak	Pueblo County
Average entry level wage offered	\$12.04	\$12.15	\$9.39	\$9.24
Number of vacancies included	836	1,144	1,523	512
Employer size (in percent)				
Small to mid-size employers	46.8	28.2	59.2	71.3
Large employers	53.2	71.8	40.8	28.7
Education requirements (in percent)				
No diploma required	20.8	24.3	40.9	30.5
High school/GED required	33.7	37.2	42.0	36.1
Vocational training/certification required	18.2	12.8	10.0	17.0
Two-year degree required	3.0	3.6	.7	4.3
Bachelors degree required	17.5	20.5	4.9	8.6
Advanced degree required	6.8	1.5	1.6	3.5
Experience requirements (in percent)				
No experience required	33.7	33.3	45.7	50.4
General work experience required	15.8	13.4	17.7	9.8
Experience in a related field required	22.6	23.2	19.1	16.0
Experience in this occupation required	27.9	30.2	17.5	23.8
Employer's industry classification (in percent)				
Construction	7.0	1.2	6.1	2.9
Manufacturing	5.5	8.7	6.1	4.1
Transportation, communications, and public utilities	2.5	5.8	10.8	1.6
Wholesale trade	3.0	3.6	11.4	3.9
Retail trade	20.6	19.4	25.1	35.0
Finance, insurance, and real estate	2.5	11.9	7.2	1.0
Services	33.1	39.0	28.1	42.8
Public administration	25.8	10.5	5.2	8.8
Standard Occupational Classification category (in percent)				
Management, professional, and related occupations	33.6	36.9	11.8	25.8
Service occupations	20.9	15.1	29.3	35.4
Sales and office occupations	23.2	37.7	33.6	19.5
Natural resources, construction, and material moving occupations ..	9.8	4.8	9.1	7.4
Production, transportation, and material moving occupations	12.4	5.5	16.2	11.9
Employment status (in percent)				
Permanent employment	88.6	90.0	97.1	96.5
Temporary employment	11.4	10.0	2.9	3.5
Employer's offering/contribution to medical insurance (in percent)				
No medical insurance offered	28.1	23.5	18.8	33.0
Medical insurance offered, but no contribution to premium	3.7	1.1	5.5	4.7
Partial contribution to insurance premium	50.7	52.8	52.9	33.2
Total cost of premium paid	17.5	22.6	22.8	29.1

NOTE: Percentages may not total to 100 in each characteristic by region due rounding.

SOURCE: Job Vacancy Surveys, Colorado Department of Labor and Employment, 2001.

Location, industry and broad occupational category hopefully explain a large portion of institutional vacancy characteristics.¹⁴

The analysis presented in this article uses 37 categories within 8 vacancy characteristic groups. Making full use of the coefficients estimated in the regression would allow for thousands of combinations of wage differentials. The actual results of the regression are provided for anyone wishing to draw additional conclusions. The purpose of this article is to investigate the size-wage premium in each of Colorado's Front Range Job Vacancy Survey regions, therefore, the analysis provided here concerns only employer size classification as it relates to human capital and institutional vacancy characteristics.

Because eight groups of vacancy characteristics were studied and one less indicator variable than the number of categories

was used in each group, the regression estimated includes 29 indicator variables. To avoid multicollinearity, a correlation matrix was analyzed prior to estimation. Of the 416 possible two-way simple correlations between the 29 variables, only 19 were more than 0.3 and only five of those more than 0.5, leaving the author confident that the estimates are not biased due to high correlation among explanatory variables.

Results

The natural logarithm of the entry-level wages offered by Colorado Front Range employers was regressed against indicator variables using ordinary least squares regression. White's test for heteroskedasticity was performed on the

Exhibit 1. Dummy variables used in ANOVA regression

Variable	Description	Variable	Description
SIZ1	Large firms	IND5	Retail trade
LOC1	Larimer/Weld Job Vacancy Survey region	IND6	Finance, insurance, and real estate
LOC2	Pikes Peak Job Vacancy Survey region	IND7	Public administration
LOC3	Pueblo Job Vacancy Survey region	OCC1	Management, professional, and related occupations
EDU1	High school/GED required	OCC2	Sales and office occupations
EDU2	Vocational/certification required	OCC3	Natural resources, construction, and maintenance occupations
EDU3	Two-year degree required	OCC4	Production, transportation, and material moving occupations
EDU4	Bachelor's Degree required	TEMP1	Temporary employment
EDU5	Advanced degree required	INS1	Medical insurance offered, but no contribution to premium
EXP1	General work experience required	INS2	Partial contribution to insurance premium
EXP2	Experience in a related field required	INS3	Total cost of premium paid
EXP3	Experience in this occupation required	OUT1	Outliers below minimum wage
IND1	Construction	OUT2	Outliers above \$34.99 per hour
IND2	Manufacturing		
IND3	Transportation, communications, and public utilities		
IND4	Wholesale trade		

NOTE: Baseline category—small to mid-size—Denver Metro—Permanent—no education—no experience—services occupation/industry—no insurance.

SOURCE: Job Vacancy Surveys, Colorado Department of Labor and Employment, 2001.

resulting error terms and it was determined that the residuals displayed nonconstant variance, but the source of the problem was not apparent. Even if the source of the problem had been evident, the traditional corrective measures for this problem do not make sense given the dichotomous nature of the independent variables. As an alternative, White heteroskedasticity—consistent standard errors and covariances— were used to compensate for the effects on estimate efficiency.¹⁵

Even with the more restrictive standard error calculations, all but two of the 29 coefficients and one constant estimated were statistically significant at the 99 percent level of confidence. The remaining coefficients were significant with more than 90 percent confidence. (See table 3.) In particular, the coefficient of the indicator variable representing the wage differential paid to large firms as opposed to small to mid-size firms, all else constant, was estimated to be statistically significant with over 99 percent confidence. Together, all of the characteristics examined explain about 75 percent of the total variation in entry-level wages offered by Front Range employers.

Special caution must be taken in interpreting the estimated

coefficients because equation 1 takes the log-linear form. Robert Halvorsen and Raymon Palmquist suggest that taking the antilog of the estimated coefficient and subtracting 1 approximates the relative change in the average value of the dependent variable.¹⁶ Following this methodology, the differential effects of each of the categories within the seven vacancy characteristic groups investigated are listed in table 4.

Like the overall average wages reported in table 2, wages in the Denver Metro region were estimated to be higher than those offered in the other Front Range regions, even while holding the effects of education, experience, and the other vacancy characteristics under consideration constant. The entry-level wages offered to fill vacancies requiring increasing levels of experience were also higher than those requiring no work experience. The differential effects ranged from 6.42 percent for vacancies requiring general work experience to 28 percent for vacancies requiring experience in the specific occupation being recruited. Similarly, the entry-level wage differentials estimated in this article are consistent with traditional findings that, all else constant, jobs requiring successively higher levels of education pay higher wages with the exception

Table 3. Employer size-wage premium regression results, based on the Job Vacancy Survey of the Front Range Colorado region, 2001

[Dependent variable: LOG(ENTRYOFFER)]

Variable	Coefficient	Standard error	t-Statistic	Probability
C	1.829239	0.015631	117.0258	0.0000
SIZ1 .....	.032420	.009670	3.352585	.0008
LOC1	-.054828	.012489	-4.389961	.0000
LOC2	-.081824	.011008	-7.432865	.0000
LOC3	-.148404	.014051	-1.56172	.0000
EDU1 .....	.072699	.009888	7.352055	.0000
EDU2 .....	.244181	.018383	13.28324	.0000
EDU3 .....	.275751	.036473	7.560382	.0000
EDU4 .....	.369004	.022666	16.27998	.0000
EDU5 .....	.329138	.038606	8.525669	.0000
EXP1 .....	.062202	.012325	5.046637	.0000
EXP2 .....	.144346	.013026	11.08153	.0000
EXP3 .....	.279997	.015472	18.09748	.0000
IND1 .....	.217094	.025381	8.553334	.0000
IND2 .....	.080043	.016998	4.708999	.0000
IND3 .....	.172037	.017739	9.698103	.0000
IND4 .....	.151211	.016230	9.316521	.0000
IND5	-.027378	.012287	-2.228244	.0259
IND6 .....	.078310	.017653	4.436107	.0000
IND7 .....	.168613	.017838	9.452297	.0000
OCC1 .....	.276592	.018238	15.16605	.0000
OCC2 .....	.099110	.011250	8.809611	.0000
OCC3 .....	.138384	.021176	6.535100	.0000
OCC4 .....	.113382	.014946	7.585895	.0000
TEMP1 .....	.102132	.018099	5.643087	.0000
INS1 .....	.042913	.022747	1.886507	.0593
INS2 .....	.078433	.011310	6.934750	.0000
INS3 .....	.138586	.015215	9.108718	.0000
OUT1	-.860916	.030107	-28.59503	.0000
OUT2 .....	.966754	.060520	15.97400	.0000
R-squared		Mean dependent variable		2.244435
Adjusted R-squared	751394	S.D. dependent variable .....		.497205
S.E. of regression .....	.247908	Akaike info criterion .....		.055928
Sum squared residual	244.9121	Schwarz criterion .....		.102985
Log likelihood	-82.27527	F-statistic		419.3459
Durbin-Watson statistic	1.947291	Probability (F-statistic) .....		.000000

NOTE: Based on least squares method (White Heteroskedasticity-Consistent Standard Errors and Covariance).

SOURCE: Job Vacancy Surveys, Colorado Department of Labor and Employment, 2001.

Table 4. Differential effects of job vacancy characteristics, based on the Job Vacancy Survey of the Front Range Colorado region, 2001

[In percent]

Variable	Effect	Variable	Effect
SIZ1	3.30	LOC1	-5.34
EXP1	6.42	LOC2	-7.86
EXP2	15.53	LOC3	-13.79
EXP3	32.31	IND1	24.25
TEMP1	10.75	IND3	18.77
INS1	4.38	IND4	16.32
INS2	8.16	IND5	-2.70
INS3	14.86	IND6	8.15
EDU1	7.54	IND7	18.37
EDU2	27.66	OCC1	31.86
EDU3	31.75	OCC2	10.42
EDU4	44.63	OCC3	14.84
EDU5	38.98	OCC4	12.01

NOTE: Baseline category—small to mid-size, Denver Metro, no education, no experience, services occupation/industry, no insurance.

SOURCE: Job Vacancy Surveys, Colorado Department of Labor and Employment, 2001.

of wages paid for advanced degrees, which are slightly lower than those paid for bachelor's degrees. The differential effects of increasing levels of educational attainment ranged from 7.27 percent for a high school/GED level of education to 36.90 percent for a bachelor's degree. Vacancies requiring an advanced degree were offered an average of 32.91 percent higher wages than those requiring no education.

WHILE THE ESTIMATED WAGE DIFFERENTIAL related to

large firms was statistically significant, the effect of employer size on entry-level wages offered by Colorado Front Range employers was smaller than any other category of vacancy characteristic. Similar to previous studies, however, this study finds that the firm size effect still exists and it is not explained by human capital or institutional vacancy characteristics. Even when controlling for the effects of these characteristics, this study finds that large firms offered average wages that were 3.30 percent higher than small to mid-size firms. □

Notes

¹ H. L. Moore, *Laws of Wages: An Essay in Statistical Economics* (New York, Augustus M. Kelley, 1911).

² Charles Brown, and James Medoff, "The Employer Size-Wage Effect," *Journal of Political Economy*, 1989, vol. 97, no. 5, pp. 1027–59.

³ For a review of recent research testing these hypotheses, see W. Y. Oi, and T. L. Idson, "Firm Size and Wages," *Handbook of Labor Economics* (Elsevier Science, 1999) vol. 3, chapter 33, pp. 2166–2214.

⁴ Arapahoe/Douglas Works is a cooperative project between Arapahoe and Douglas Counties, funded by the Workforce Investment Act passed by Congress in 1996. The goal of this project was to improve labor market conditions by bringing together compatible employers/recruiters and jobseekers.

⁵ Firm-specific effects for multiple vacancy firms is worthy of further analysis, but for this study, because the firm's size, industry, and location are all included in the analysis, vacancies reported by a particular firm would all have the same characteristics.

⁶ Although this study does not examine wages other than the lowest within the range, the author considers this worthy of future research. The author opines, however, that many employers are only willing to pay the lower end of the range unless the candidate is overqualified. Also, many employers only report one wage, rather than a range. Looking into the size of the range is an interesting idea as well, this would go well with the firm-specific effects mentioned in the previous note. Without investigating the size of the wage ranges, however, using the lower end should provide a lower bound to the size of the wage premium.

⁷ Limiting observations to those vacancies providing statistics regarding sign-on bonuses proved prohibitive relative to the additional explanatory value they provided.

⁸ Although both of these measures of how difficult it is to fill the vacant position probably affect the wages offered by the employer, the direction of the causation between wages and difficulty to fill a position is not obvious—that is, employers may offer a higher wage in order to attract qualified candidates to fill positions the employers expect may be more difficult to fill or, the vacancies may be more difficult to fill because the wages offered are insufficient to attract qualified candidates. Because of this uncertainty and unavailability of additional information, which might have been used to produce a system of simultaneous equations accurately describing the relationship between wages and the difficulty employers experience recruiting for the vacancies, these measures were not used in the analysis.

⁹ Job Vacancy Survey reports for each region are available on the Internet at: www.coworkforce.com/lmi/wra/home.htm.

¹⁰ To determine region-specific large firms, this study ranks all firms from largest to the smallest by employment. Employment is accumulated starting with the largest firm and cuts off when the aggregate is roughly one-third. That is, large employers in a region consist of the largest firms accounting for approximately one-third of the regions total private employment.

All other private sector firms with at least five employees are referred to as small to mid-size firms. Multiple attempts are made to contact every large, private sector employer as well as all Federal, State, and local government agencies in the area. The remaining small to mid-size private sector employers are then stratified by industry and a random sample of employers is contacted in each stratum. The small to mid-size employers in Job Vacancy Survey regions containing Colorado's Metropolitan Statistical Areas (MSA's) are stratified by major industry division based on the U.S. Office of Management Budget *Standard Industrial Classification Manual, 1987*. Manufacturers are further divided into durable and nondurable goods-producing categories. County as well as industry stratify the employers in the six County Denver Metro Job Vacancy Survey region. In the rural areas of Colorado, employers are categorized as either goods or service producing, as there are not a sufficient number of employers in each region to accurately represent each individual industry with statistical reliability.

¹¹ Vacancies reported by employers in the Agriculture and Mining industries are not included in the sample.

¹² The baseline category in this regression represents vacancies in small to mid-size employers located in the six county Denver Metro Job Vacancy Survey region that require no education and no experience, are permanent positions in the service occupations category, and are offered by employers in the Services industry.

¹³ Gary S. Becker, *Human Capital, 2nd Edition* (New York, National Bureau of Economic Research, 1975).

¹⁴ Brown, and Medoff, "The Employer Size-Wage Effect."

¹⁵ The estimated residuals of the regression were also tested against the normal distribution. The test rejected the null hypothesis of a normal distribution. This was largely due to a high kurtosis of 4.45. Given the large sample, however, the estimates should be unbiased and consistent.

¹⁶ Robert Halvorsen and Raymon Palmquist, "The Interpretation of Dummy Variables in Semilogarithmic Equations," *American Economic Review*, vol. 70, no. 3, 1980, pp. 474–75.