Work Activities as Firm-Specific Human Capital: Estimates of the Effects on Wages

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Abstract:

This paper provides an empirical examination of Lazear's (2003) skills-weighted approach to firm-specific human capital and makes inferences about the contribution of skill differentials to increasing between- and within-group wage inequality. We find evidence that primary and secondary work activities are general skills that have large statistically significant effects on wages. Furthermore, returns on most primary work activities remain positive and significant even when we control for individual ability. Our empirical results support Lazear's assumption that most firm-specific skills are actually general skills that earn different returns across firms. However, these returns are almost always less than half of those when we do not control for individual ability which indicates a large portion of the returns to skills are firm-specific. This indicates that a large proportion of the returns to work activities result from individual ability or the firm-worker match.

JEL Codes: J22, J24, J31

Key words: Firm-Specific Human Capital, Wages, Time Use

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I. Introduction

The human capital model predicts that individuals invest in general and firm-specific skills that earn a return on the job. Most empirical research on the human capital model has focused on the returns to general human capital as measured by schooling.[1] Far fewer studies have estimated the effect of firm-specific human capital on wages. When researchers have estimated the effect of firm-specific human capital on wages, they have used job tenure as a proxy variable. Neither estimates of the returns to schooling or job tenure measure actual skills used on the job. In a related line of inquiry, research on wage inequality argues that an increase in inequality observed through the 1990s is the result of skill-biased technological change (Katz and Autor, 1999). Like the human capital literature, research on inequality rarely quantifies or estimates the impact of skills on wages because direct measure of skills are missing from most data sets from the United States. This paper provides an empirical investigation of the effect of skills on wages. We use data from the National Survey of College Graduates (NSCG) and the Science and Engineers Statistical Data System (SESTAT) to investigate the effect of skills, measured by work activities, on wages. We find that work activities provide adequate measures of work skills and have significant effects on wages.

We begin this analysis with several goals in mind. First, we evaluate whether work activities are skills that earn separate returns from other human capital investments. Our analysis will allow us to distinguish skill prices net of previous investments in general human capital (schooling) and occupational choice. Second, we seek to empirically identify skills that earn the highest returns. In particular, we investigate the effect of working with a computer on earnings after controlling for unobserved individual characteristics, allowing us to evaluate evidence for

[1] For a recent review of the literature, see Card 1999.

or against the skill-biased technological change hypothesis. Third, we investigate how much of the return to work activity results from individual ability by using panel data to control for unobserved characteristics.

The paper is organized as follows: section two discusses the previous literature; section three discusses the data; section four provides a conceptual discussion of firm-specific human capital and the empirical specification; section five presents the results; and section six concludes.

II. Literature Review

Although skills are rarely observed in U.S. data sets, recent research attests to the importance of skills as an explanation for firm- or occupation-specific human capital investments, increasing wage inequality, and the returns to working with a computer. In the first line of inquiry, Lazear (2003) develops a model of firm-specific human capital investment where firm-specific human capital results in the acquisition of general skills that are readily transferable across firms. Firms pay for these skills based on their different valuations, and a worker possesses a combination of skills that are useful in different proportions to various firms. The worker's investment in a firm-specific combination of skills is based on an expectation of leaving the current firm. If the expectation is high, the worker will invest in a combination of skills that are more highly valued by the market. Lazear (2003) provides no empirical examination of his theoretical model. In related work, Shaw (1984) argues that workers invest in occupational skills that are transferable across occupations. She develops a measure of occupational investment and shows that this investment yields a higher return than work experience.

Research on wage inequality has attributed the increase in between- and within-group inequality to increasing returns to skills. Katz and Murphy (1992) constructed a supply and demand framework to explain the pattern of wage premiums for college graduates during the 1960s, 1970s, and 1980s. They showed increased demand for high-skilled workers exceeded increased supply of high-skilled workers to account for a modest increase in the college wage premium during the 1960s and a significant increase during the 1980s. The opposite was true of the 1970s when the college wage premium declined. Bound and Johnson (1992) attributed increased wage inequality in the 1980s to an increase in demand for skilled workers prompted by skill-biased technological change. Juhn, Murphy and Pierce (1993) used the March CPS to argue that a rising wage inequality among males between 1963 and 1989 was a result of increased demand for unobserved skill that was likely due to technological change. Although these papers attribute the increase in wage inequality to increasing returns to skill, skill is either unobserved, proxied by a residual in the wage regression, or measured by the schooling variable. Juhn, Murphy, and Pierce (1993) attribute the increase in within-group inequality to unobserved skills. This suggests that if skills can be quantified, measures of within-group inequality may be diminished.

Skill-biased technological change has emerged as the consensus explanation for the increase in between-group wage inequality. Autor, Katz and Krueger (1998) used four data sets to analyze the effects of skill-biased technological change as measured by computerization. They primarily assessed the variation of relative wage movements for 1940-1990 to determine if factors present in the 1980s, the decade with substantial computer advances, were absent in other periods with different movements. The authors concluded that computerization was correlated with a strong growth in demand that favored college graduates over that time period.

Others have examined the skill-biased technological change hypothesis by estimating the effect of working with a computer and investment in computers on wages. Krueger (1993) used the Current Population Survey (CPS) to examine the correlation between wages and workers who use computers. He argued that the wage premium for working with a computer was the result of skill-biased technological change. Corroborating evidence on the effect of computers on wages comes from Europe. Oosterbeek (1997) used longitudinal data from The Netherlands to estimate returns to computer use. He found approximately an 11 percent return to computer use, but this return did not increase with the intensity of computer use. In addition, Oosterbeek used a fixed-effects model to regress the change in net hourly log wages on indicators of computer use and intensity, and found a 9.6 percent return to computer use. Entorf and Kramarz (1996) studied whether workers who use computer-related new technology are better paid because they are more able or because the technology increases their productivity. Using French data that matches individuals with firms, the authors determined that new technology workers who had no new technology experience did have a wage advantage over workers who did not use new technology.

However, others have argued that skill-biased technological change cannot be the only source of wage inequality and changes in the wage structure. DiNardo and Pischke (1997) used Krueger's methodology with German data to show a similar return to the use of calculators, pens, pencils, and telephones as the return to the use of computers found by Krueger. Likewise, Card and DiNardo (2002) cast doubt on the hypothesis of skill-biased technological change by offering a number of problems associated with the hypothesis.

Finally, researchers have created proxy measures for skills or using European data, have estimated the impact of skills on wages. In the United States, lack of sufficient data has made it difficult for any direct measure of the returns to skill. Nevertheless, some researchers attempting to measure returns to skill have relied on proxy variables. Ingram and Neumann (2000) matched job characteristic data in the Dictionary of Occupational Titles (DOT) with employment and demographic data in the CPS to construct four skill factors using a structural factor model. Results of regressions with these proxies indicated the quantity of skilled labor and the return to skilled labor has risen dramatically since 1975, but workers who attend college without investing in practical job skills experienced no income growth over the same period. These results indicate that on the job skill acquisition may be an important determinant of wages. Autor, Levy, and Murnane (2003) use the DOT to classify jobs by broad skill requirements. They argue that computer capital substitutes for routine cognitive and manual tasks and complements non-routine problem-solving tasks. They find that computerization and the resulting changes in tasks can explain 60 percent of the increase in relative demand for college labor.

In Britain, data sources exist that are more conducive to a direct measure of returns to skill. Borghans and ter Weel (2003) utilized the 1997 British Skills Survey to compare returns to computer skills with returns to writing and math skills. The authors controlled for both the level of sophistication of computer use to remove bias and work tasks to distinguish true skills from those that are obtained as a by-product of the tasks workers perform. They concluded that returns to computer skills exist only if advanced skills related to tasks such as programming and design are used. Dickerson and Green (2002) used both the 1997 and 2001 British Skills Surveys. They used factor analysis to construct skill indices that capture correlations between different job activities and facilitated a formation of generic job skills. The study indicated that high-level communication skills and computing skills carry positive wage premiums.

III. The Data

Our data include the 1993 National Survey of College Graduates (NSCG) and the 1993, 1995, 1997 and 1999 waves of the Science and Engineers Statistical Data System (SESTAT). These data sets contain information on employment, including occupation; education, including college major; and demographic characteristics of individuals in the Unites States who have a bachelor's degree or higher. The NSCG is a subset of individuals across all educational disciplines and occupations from the 1990 Decennial Census. SESTAT is an integration of individuals from three different surveys: the NSCG, the Survey of Doctoral Recipients (SDR) and the National Survey of Recent College Graduates (NSRCG). SESTAT includes only individuals who either work or are educated in science and engineering.

Both the NSCG and SESTAT contain variables that indicate general work activities occupying 10 percent or more of an individual's time at work in a typical work week. These work activities include accounting and finance, applied and basic research, computer use, development, design, employee relations, management, production operations, professional services, sales, quality management, teaching and other work activities. Separate variables indicate whether a work activity is primary--the activity on which the individual spends the most time, or secondary--the activity on which the individual spends the second most time. All individuals must list only one primary work activity and may or may not list only one secondary work activity. Table 1 gives a description of each work activity.

In the NSCG sample, we retain all males and females with complete surveys aged 25 to 60 who are working full-time, were working five years prior to 1993, are not in school, are not self-employed and are not in the military. In addition, we exclude all records with imputed earnings; earnings below the annual full-time minimum wage ($7,438 in 1993); imputed primary, secondary and general work activities; and imputed schooling. We restrict the four SESTAT samples to include only those individuals who remain in the 1993 NSCG after the aforementioned exclusions. In all samples, we adjust earnings to 1996 dollars using the deflator for Personal Consumption Expenditures.

The NSCG and SESTAT data sets categorize occupations and college majors differently. The NSCG contains profession-related occupation and college major categories. Occupations and college majors in SESTAT are categorized by either a broad or detailed science- or engineering-related field. Correlations indicate a strong relationship between the two sets of occupations, and our regression results are not highly sensitive to the set of occupation categories chosen. Unless otherwise noted, we have chosen to include the NSCG occupation and major categories in regressions using 1993 data.

We separate the NSCG sample into three different data sets: the full 1993 NSCG sample (the full sample); a sub-sample of individuals who are in both the 1993 NSCG and 1993 SESTAT samples (the SESTAT or science sample); and a sub-sample of individuals in the 1993 NSCG sample but not the 1993 SESTAT sample (the non-science sample). We construct a balanced panel of individuals who changed jobs anytime between 1993 and 1997 using the earliest three SESTAT samples (the SESTAT panel sample).[2] Finally, we construct an unbalanced panel that includes individuals who are in any of the 1993-1999 SESTAT samples and the 1993 NSCG (the pooled SESTAT sample). Table 2 contains descriptive statistics for the full sample and the pooled SESTAT sample.

As seen in Table 2, log weekly earnings, years of experience, the percent of males and whites are slightly higher in the pooled SESTAT sample. Each sample contains approximately the same percent of people with a bachelor's, master's, professional or doctorate degree.

Management is the most prevalent primary and secondary work activity in each sample. Computer use and professional services also have a strong presence as primary work activities in each sample. The full sample includes more people reporting teaching as a primary work activity than in the pooled SESTAT sample. Finally, a significant number of people in each sample do not list a secondary work activity.

IV. General Skills as Firm-Specific Human Capital—Theoretical and Empirical Approaches

A. The Theory

We use and somewhat modify a model by Lazear (2003) to examine the effect of work activities on wages. Lazear (2003) formulates a skills–weighted approach to firm-specific human capital. He argues that most firm-specific skills are actually general skills that are valued differently by a given firm. In a simple two-period model, a worker with skill set *(A,B)* can earn wages *W* at firm *i*:

$$W_i = \lambda_i A + \left(1 - \lambda_i\right) B \tag{1}$$

Where λ_i is the value a firm places on the primary work activity (the task a worker does the most on the job) and $(1-\lambda_i)$ is the value a firm places on the secondary work activity. The λ_i reflects the fact that firm *i* may place a different value on the work activity than firm *j*.

These general skills may be enhanced on the job. The cost of investing in the skills is given by $C(A,B,\mu)$, where the cost is a function of the particular skill and individual learning ability, μ. We assume that the costs of investing in skills are lower for more able individuals,

[2] Lack of data on job changes in the 1999 public use sample prevented its inclusion in the panel.

$\partial C / \partial \mu < 0$ and μ does not vary across skills *A,B*.

Workers live for two periods. They invest in general skills in period one given that they work at firm 1 and knowing that there is a probability $p < 1$ that they will remain at firm 1. A worker must choose an investment strategy for general skills. Let the random variable λ have a density of $f(\lambda)$. A worker at firm 1 chooses to invest in general skills *A* and *B* to maximize net earnings:

$$W_i = p[\lambda_1 A + (1-\lambda_1)B] + (1-p)\left[\int_0^1 [\lambda A + (1-\lambda)B] f(\lambda) d\lambda\right] - C(A,B,\mu) \tag{2}$$

A worker's investment decision depends upon the probability of separation, *(1-p)* and individual learning ability. The first order conditions with respect to skill investment are given by:

$$\begin{aligned} \frac{\partial W_i}{\partial A} &= p\lambda_1 + (1-p)\bar{\lambda} - C_A = 0 \\ \frac{\partial W_i}{\partial B} &= p(1-\lambda_1) + (1-p)(1-\bar{\lambda}) - C_B = 0 \end{aligned} \tag{3}$$

The investment in skills is a weighted average of the relevant skill-weights inside the firm and outside, where the relative investment depends upon the probability of separation.

One can conclude from the above formulation that the market return on skills is the average valuation of skills over all firms, $\bar{\lambda}$. Our goal is to determine empirically whether firms reward workers for skills as measured by work activities and the extent to which the return on these skills are a function of purely firm-specific returns or individual ability.

B. Empirical Specification

Consider the following empirical specification given in equation (4) for individual *i* in job *j* at time *t*:

$$W_{ijt} = \alpha + \beta X_i + \gamma V_{ijt} + \bar{\lambda}\, Skill_{ijt} + \varepsilon_{ijt} \tag{4}$$

Wages, *W,* are a function of individual, time-invariant characteristics, *X* (i.e. schooling and demographic variables), time-varying characteristics, *V* (i.e. work experience and occupation), time-varying work activities, *Skill*, and an error term. We can decompose the error term into $\varepsilon_{ijt} = \mu_i + \upsilon_{ijt}$ where μ_i is unobserved individual learning ability and υ_{ijt} is a stochastic error term. We may obtain unbiased estimates of the effect of skill on wages using equation (2), provided that individual ability, μ_i, does not influence skill acquisition. However, the theoretical formulation given above renders this unlikely. High-ability workers will be motivated to invest more in firm-specific human capital in order to reap higher returns. Thus, we will exploit the panel aspect of our data to control for individual ability in equation (5) using a sub-sample of those who change employers to estimate a fixed effects model of the effect of skills on wages.

$$\Delta W = \gamma \Delta V + \bar{\lambda} \Delta Skill + \Delta \varepsilon \tag{5}$$

Equation (5) will provide unbiased estimates of the effect of skills on wages. If the skills embodied by work activities are purely firm-specific, then the estimated impact of work activities on wages will be zero for job changers. Likewise, if the returns on work activities reflect pure ability, we would expect little to no impact of work activities on wages for job changers. However, if Lazear's assumption is correct, then the effect of skills on wages, $\bar{\lambda}$, will be non-zero.

We can also use our empirical framework to examine the skill-biased technological change hypothesis. Skill-biased technological change implies that workers who use computers or other advanced technologies will earn higher wages when compared to other work activities.

We should also observe higher wages for workers whose skills are complements for technological investment—workers engaged in tasks involving cognitive, non-routine work such as management, research and development, and product design. Finally, we would expect to find a higher return for workers with general human capital investments in science and engineering when compared with non-science majors.

V. Empirical Results

A. The Effect of Work Activities on Wages

We begin by examining the distribution of primary, secondary, and general work activities across occupations in the NSCG and SESTAT samples. It could be that work activities are highly correlated with occupations and therefore are proxies for occupational choice. Table 3A shows the mean primary work activities, Table 3B shows the mean secondary work activities, and Table 3C shows the mean general work activities by occupation in the full sample. Tables 4A through 4C show the mean work activities by occupation for the pooled SESTAT sample that combines all survey waves.

In both the full sample and the pooled SESTAT sample, each occupation embodies some degree of all general work activities. With few exceptions, each occupation also has a predictable set of prevalent primary, secondary and general work activities. For example, design is the most prevalent primary work activity in the full sample's architecture/engineering occupation; applied research and development have the highest frequency of secondary work activities in the pooled SESTAT sample's chemistry occupation; and the general work activities with the highest frequency in the full sample's administrative support occupation are accounting/finance, computer use and management. Two notable exceptions to this reasonable distribution include the high frequency of professional services as a primary and general work activity in the full sample's personal care occupation and the high frequency of no secondary work activity across occupation in both samples. We do find that some occupations and work activities are highly correlated. For example, 90 percent of those working in an education occupation report teaching as a primary work activity.

Next, we estimate a series of wage regressions that include controls for demographic characteristics, schooling, work experience, occupation dummies, and primary, secondary, and general work activities.[3] Figures 1 through 3 graph the effect of primary, secondary, and general work activities (relative to the omitted work activity of production) on wages. All primary and secondary work activities have positive and significant returns at the one percent level. Development, sales, and applied research earn the three highest returns to primary work activities. It can be argued that both development and applied research are complements to technology investments because they require cognitive, non-routine skills. However, sales is mostly a function of communication skills and not necessarily complementary to technological investments.

The returns on secondary work activities in Figure 2 are significantly lower than the returns on primary work activities. Sales, development, and management earn the highest returns to secondary work activities but the effects are about half the size of the primary work activities. The effect of general work activities on wages in Figure 3 vary considerably from the effects of primary and secondary activities. Almost half of the general work activities have

[3] The actual specification regresses log weekly earnings on years education, a quartic in experience and dummy variables for female, black, Hispanic, other race, midwest, south, west, married, divorced, master's degree, professional degree, doctorate degree, occupations, college majors, and primary, secondary and general work activities, including accounting/finance, applied research, basic research, computer use, development, design, employee relations, management, professional services, sales, quality management, teaching, other and no secondary work activity.

negative effects on wages.

As a primary work activity, the return to computer use is only higher than three of the other twelve primary work activities—teaching, quality management, and employee relations. As a secondary work activity, the return to computer use is only higher than the return to employee relations.

It could be that the effect of work activities on wages varies depending upon one's investment in general human capital. For example, those who study science in college may have a comparative advantage in working with a computer compared with those who do not. To examine this possibility, we split the 1993 NSCG into two sub-samples: those who studied in or work in a scientific field (the 1993 SESTAT sample) and those who do not (the 1993 non-science sample). Figures 4 through 6 graph the effect of work activities on wages for these two sub-samples. With the exception of computer use, the returns to primary work activities are higher for individuals in the non-science sample than scientists in the SESTAT sample. However, returns to all secondary work activities are much higher in the SESTAT sample. In general, these returns are significant at the one percent level across both samples. The returns to general work activities sometimes move in the same direction in both samples. The highest returns are to management activities and the lowest returns are to teaching. We tested the null hypothesis that the returns to primary work activities are the same in the SESTAT and non-science samples. We reject the null hypothesis for the following primary work activities at the one percent level: accounting/finance, computer use, development, design, management, professional services, sales and teaching. Thus, we find lower returns to primary work activities for those with general human capital investments in science and engineering.

As mentioned above, the effect of work activities on wages may be the result of ability bias, or may reflect the return to a pure firm-specific human capital investment instead of the return on a general skill. In order to explore this possibility, we estimate a fixed effects model for those workers who changed jobs (and in most cases work activities) between 1993 and 1997. We compare the fixed effects estimates with estimates of work activities from the same sample that does not control for unobserved individual characteristics in Figures 7 through 9. The coefficients for primary work activities in the fixed effects model are statistically significant at the five percent level for all activities with the exception of accounting/finance, applied research, basic research, and professional services. For secondary work activities, design is the only activity that is statistically significant in the fixed effects model, and no general work activities are statistically significant in fixed effects models. In general, the effects of work activities on wages fall by more than one-half for both primary and secondary work activities. These results indicate that some of the estimated effect of the computer use, design, development, employee relations, management, quality management, sales, teaching and other work activities may be the result of either individual ability or are largely firm-specific.

B. Work Activities and the Skill-Biased Technological Change Hypothesis

Our empirical results allow us to further scrutinize the skill-biased technological change hypothesis—one of the leading explanations for the increase in wage inequality. We are well-positioned to do so because we can estimate the effect of skills on wages with our data, we have estimated the effect of skills on wages after controlling for unobserved heterogeneity, and since we have a number of skills in our data set, we can compare the estimated effect of working with a computer to other skills.

The skill-biased technological change hypothesis has been offered as an explanation for the increase in between-group earnings inequality (often measured by the college wage premium) and within-group earnings inequality (often measured by the dispersion of residuals from wage regressions). Since our data consist entirely of college graduates, we will not be able to speak directly to skill-biased technological change and the increase in the college wage premium. Instead, we will discuss whether our empirical results reflect increasing returns to working with a computer and the returns to general human capital investment in science and engineering. However, we are well-positioned to examine whether skill-biased technological change contributed to the increase in within-group earnings inequality. Juhn, Murphy, and Pierce (1993) argue that the increase in within-group earnings inequality reflects increasing returns to unobserved skills resulting from technological change. If the Juhn, Murphy, and Pierce hypothesis is valid, we would expect to find that within-group wage inequality would fall after controlling for skills as measured by work activities.

C. Work Activities and Between- Group Earnings Inequality

The results above indicate that there is a substantial return to working with a computer, and the effect of working with a computer remains positive and significant after controlling for individual ability. In addition, there are significant returns to cognitive, non-routine skills such as management, research and development, and design that are complements to technological investments. These results suggest that those who work directly with technology (computer programmers) and who are complements to technology (managers and researchers) earn higher wages.

However, we should note some important caveats. First, if skill-biased technological change is the driving force behind higher wages for college-educated workers, then we would expect that working with a computer would earn one of the highest returns. Instead, the effect of working with a computer falls somewhere on the lower end of the estimated effect of primary work activities on wages. Second, the high estimated returns to activities such as sales indicate that not all of the returns to skill need to be related to technological change. Finally, we do not observe higher returns to work activities for those individuals who have a general human capital investment in science and engineering. Thus, our results provide mixed evidence in support of skill-biased technological change explanation for the increase in between-group earnings inequality.

D. Work Activities and Within- Group Earnings Inequality

We now consider whether skill-biased technological change provides an adequate explanation for within-group earnings inequality. We do so by comparing residual wage inequality before and after including work activities in the wage regression. Residual wage inequality is measured by the standard deviation and the 90-10 differential of residual wages for three separate samples, the 1993 full sample, the 1993 SESTAT sample, and the 1993 non-science sample.

Tables 5 shows the change in within-group wage inequality for men and women before and after including work activities in the regression specification. Including work activities in the regression reduces the standard deviation of residual wages by between 1.1 and 1.9 percent. The largest reductions are for those in the SESTAT samples. The difference in the 90^{th} and 10^{th} percentiles of the residual wage distribution decreases by no more that 1.5 percent for women. For men, we find the counter-intuitive result that 90-10 differential increases when work activities are included in the regression.

The results in Table 5 show that residual wage inequality falls after we include work activities in the wage regressions, but the magnitude of the decline is small at best. Our results indicate that once we include Juhn, Murphy, and Pierce' s "unobserved skills" in the wage regression, there is little impact of work activities on within-group wage inequality. It could be that work activities are poor proxies for the "unobserved skills" referred to by Juhn, Murphy, and Pierce. However, we do find these work activities have a significant impact on wages and this suggests that including them in the wage regression should reduce residual wage inequality. Thus, we find little evidence supporting the skill-biased technological change explanation for the increase in residual wage inequality.

VI. Conclusions

This paper provides an empirical examination of Lazear's (2003) skills-weighted approach to firm-specific human capital and makes inferences about the contribution of skill differentials to increasing between- and within-group wage inequality. We find evidence that primary and secondary work activities are general skills that have large statistically significant effects on wages. Furthermore, returns on most primary work activities remain positive and significant even when we control for individual ability. Our empirical results support Lazear's assumption that most firm-specific skills are actually general skills that earn different returns across firms. However, these returns are almost always less than half of those when we do not control for individual ability which indicates a large portion of the returns to skills are either firm-specific or the result of individual ability.

The presence of large and significant returns to computer use activities and complements to technological investments such as management, development and design activities do lend support to the skill-biased technological change hypothesis. On the other hand, we find lower returns to work activities for scientists than for non-scientists when we expected to find higher returns. Likewise, returns to computer use as a primary or secondary work activity are lower than other work activities that do not depend on technical knowledge such as sales in both the science and non-science groups, employee relations in the non-science group and teaching in the science group. Thus, we find weak support for skill-biased technological change as a source of between-group wage inequality. Finally, the inclusion of work activities in estimates of residual wage inequality provides no evidence in favor of skill-biased technological change as a source of within-group wage inequality for both females and males.

This preliminary research finds that work activities have a statistically significant impact on wages and opens up many new avenues for research. First, we are currently in the process of obtaining the restricted use SESTAT data. This will allow us to include additional demographic variables in the SESTAT regressions along with information on job tenure. Second, we will attempt to quantify how much of the reduction in fixed-effects estimates of work activities on wages is the result of firm-worker match and individual ability. We will do so by comparing fixed effects estimates for individuals who change work activities but not jobs with our current fixed effects estimates. Finally, the restricted use SESTAT data will allow us to test additional implications in Lazear (2003).

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Table 1: Descriptions of Work Activities*

Work Activity	Description
ACCOUNTING	accounting, finance, contracts
APPL RESEARCH	applied research - study directed toward gaining scientific knowledge to meet a recognized need
BASIC RESEARCH	basic research - study directed toward gaining scientific knowledge primarily for its own sake
COMPUTER USE	computer applications, programming, systems development
DESIGN	design of equipment, processes, structures or models
DEVELOP	development using knowledge gained from research for the production of materials or devices
EMP RELATIONS	employee relations including recruiting, personnel development and training
MANAGEMENT	management and administration
NONE	no secondary work activity
OTHER	other
PRODUCTION	production, operations, maintenance (e.g. truck driving, machinist or mechanic)
PROF SERVICE	professional services including healthcare, financial services or legal services
QUAL MANAGE	quality or productivity management
SALES	sales, purchasing, marketing
TEACHING	teaching

* as described in the 1993 National Survey of College Graduates

Table 2: Descriptive Statistics for the Full Sample and the Pooled SESTAT Sample

	Full Sample		Pooled SESTAT Sample	
Number of Observations	73,143		98,711	
	Mean	Standard Deviation	Mean	Standard Deviation
Earnings and Demographics:				
LOG WEEKLY EARNINGS	6.80	0.48	6.95	0.46
FEMALE	0.36	0.48	0.25	0.43
MALE	0.64	0.48	0.75	0.43
WHITE	0.64	0.48	0.78	0.41
BLACK/HISPANIC	0.12	0.24	0.12	0.33
OTHER RACE	0.24	0.42	0.10	0.29
MIDWEST	0.21	0.41	N/A	N/A
SOUTH	0.32	0.47	N/A	N/A
WEST	0.24	0.43	N/A	N/A
EAST	0.23	0.42	N/A	N/A
MARRIED	0.74	0.44	N/A	N/A
DIVORCED	0.10	0.30	N/A	N/A
NEVER MARRIED	0.16	0.37	N/A	N/A
YEARS OF EDUCATION	16.95	1.29	N/A	N/A
YEARS OF EXPERIENCE	16.58	8.29	18.75	8.37
Highest Degree:				
BACHELOR'S	0.62	0.49	0.59	0.49
MASTER'S	0.28	0.45	0.33	0.47
PROFESSIONAL	0.04	0.20	0.05	0.21
DOCTORATE	0.06	0.25	0.03	0.16
Primary Work Activities:				
ACCOUNTING	0.07	0.25	0.04	0.19
APPL RESEARCH	0.05	0.23	0.06	0.24
BASIC RESEARCH	0.02	0.13	0.02	0.13
COMPUTER USE	0.12	0.32	0.17	0.37
DESIGN	0.05	0.22	0.09	0.28
DEVELOP	0.04	0.19	0.05	0.22
EMP RELATIONS	0.03	0.18	0.02	0.15
MANAGEMENT	0.17	0.37	0.18	0.39
OTHER	0.07	0.26	0.07	0.25
PRODUCTION	0.03	0.17	0.03	0.17
PROF SERVICE	0.11	0.32	0.11	0.31
QUAL MANAGE	0.03	0.16	0.03	0.17
SALES	0.07	0.26	0.07	0.26
TEACHING	0.14	0.35	0.06	0.24

Secondary Work Activities:				
ACCOUNTING	0.06	0.24	0.06	0.24
APPL RESEARCH	0.06	0.23	0.06	0.24
BASIC RESEARCH	0.03	0.17	0.03	0.16
COMPUTER USE	0.10	0.30	0.11	0.31
DESIGN	0.05	0.22	0.08	0.27
DEVELOP	0.06	0.23	0.07	0.25
EMP RELATIONS	0.08	0.27	0.06	0.25
MANAGEMENT	0.18	0.38	0.17	0.38
NONE	0.15	0.36	0.12	0.33
OTHER	0.03	0.17	0.02	0.15
PRODUCTION	0.02	0.15	0.02	0.15
PROF SERVICE	0.04	0.20	0.04	0.20
QUAL MANAGE	0.05	0.21	0.05	0.22
SALES	0.04	0.20	0.06	0.23
TEACHING	0.05	0.02	0.04	0.19
General Work Activities:				
ACCOUNTING	0.72	0.45	0.41	0.49
APPL RESEARCH	0.25	0.43	0.27	0.45
BASIC RESEARCH	0.14	0.35	0.13	0.33
COMPUTER USE	0.43	0.50	0.48	0.50
DESIGN	0.24	0.43	0.34	0.47
DEVELOP	0.25	0.43	0.28	0.45
EMP RELATIONS	0.37	0.48	0.35	0.48
MANAGEMENT	0.56	0.50	0.56	0.50
OTHER	0.12	0.32	0.10	0.30
PRODUCTION	0.10	0.29	0.10	0.30
PROF SERVICE	0.27	0.44	0.24	0.43
QUAL MANAGE	0.29	0.45	0.29	0.46
SALES	0.21	0.41	0.26	0.44
TEACHING	0.31	0.46	0.20	0.40
NSCG Occupations:				
MANAGEMENT	0.14	0.35	N/A	N/A
BUSINESS/FINANCE	0.10	0.30	N/A	N/A
COMPUTERS/MATH	0.11	0.31	N/A	N/A
ARCHITECTURE/ENGINEERING	0.16	0.36	N/A	N/A
LIFE/PHYSICAL SCI	0.06	0.23	N/A	N/A
SOCIAL SCI	0.02	0.13	N/A	N/A
SERVICE	0.05	0.22	N/A	N/A
LEGAL	0.01	0.11	N/A	N/A
EDUCATION/LIBRARY SCI	0.11	0.31	N/A	N/A
ARTS/DESIGN/ENTERTAIN/SPORTS	0.02	0.14	N/A	N/A
HEALTH	0.07	0.25	N/A	N/A
PROTECTIVE SERVICES	0.01	0.09	N/A	N/A
FOOD	0.00	0.04	N/A	N/A

PERSONAL CARE	0.01	0.09	N/A	N/A
SALES	0.07	0.25	N/A	N/A
SUPPORT	0.03	0.17	N/A	N/A
FARM/FISH/FOREST	0.00	0.03	N/A	N/A
TRADE	0.02	0.14	N/A	N/A
OTHER	0.03	0.16	N/A	N/A
NSCG College Majors:				
MANAGEMENT	0.11	0.31	N/A	N/A
BUSINESS/FINANCE	0.07	0.26	N/A	N/A
COMPUTER/MATH	0.07	0.25	N/A	N/A
ARCHITECTURE/ENGINEERING	0.19	0.39	N/A	N/A
LIFE/PHYSICAL SCI	0.09	0.29	N/A	N/A
SOCIAL SCI	0.11	0.32	N/A	N/A
SERVICE	0.05	0.21	N/A	N/A
LEGAL	0.02	0.13	N/A	N/A
EDUCATION/LIBRARY SCI	0.11	0.32	N/A	N/A
ARTS/DESIGN/ENTERTAIN/SPORTS	0.08	0.27	N/A	N/A
HEALTH	0.07	0.25	N/A	N/A
PROTECTIVE SERVICES	0.01	0.09	N/A	N/A
SALES	0.02	0.15	N/A	N/A
FARM/FISH/FOREST	0.01	0.08	N/A	N/A
OTHER	0.01	0.08	N/A	N/A
SESTAT Occupations:				
COMPUTER/MATH SCI	N/A	N/A	0.14	0.35
BIOLOGICAL/MEDICAL SCI	N/A	N/A	0.02	0.13
LIFE/RELATED SCI	N/A	N/A	0.01	0.10
CHEMISTRY	N/A	N/A	0.02	0.13
PHYSICS/ASTRONOMY	N/A	N/A	0.00	0.06
PHYSICAL/RELATED SCI	N/A	N/A	0.01	0.11
ECONOMICS	N/A	N/A	0.00	0.06
PSYCHOLOGY	N/A	N/A	0.01	0.10
OTHER SOCIAL SCI	N/A	N/A	0.00	0.05
ENGINEERING	N/A	N/A	0.09	0.28
CHEMICAL ENG	N/A	N/A	0.01	0.12
CIVIL ENG	N/A	N/A	0.04	0.19
ELECTRICAL ENG	N/A	N/A	0.06	0.24
MECHANICAL ENG	N/A	N/A	0.05	0.22
TOP-/MID-MANAGEMENT	N/A	N/A	0.14	0.34
OTHER MANAGEMENT	N/A	N/A	0.05	0.23
POST-SECONDARY TEACHING	N/A	N/A	0.07	0.25
NON-SCIENCE/ENGINEERING	N/A	N/A	0.27	0.45
SESTAT College Majors:				
COMPUTER/MATH SCI	N/A	N/A	0.12	0.32
BIOLOGICAL/MEDICAL SCI	N/A	N/A	0.06	0.24

LIFE/RELATED SCI	N/A	N/A	0.03	0.17
CHEMISTRY	N/A	N/A	0.03	0.17
PHYSICS/ASTRONOMY	N/A	N/A	0.02	0.13
PHYSICAL/RELATED SCI	N/A	N/A	0.02	0.15
ECONOMICS	N/A	N/A	0.02	0.15
PSYCHOLOGY	N/A	N/A	0.06	0.24
OTHER SOCIAL SCI	N/A	N/A	0.03	0.18
SOCIOLOGY/ANTHROPOLOGY	N/A	N/A	0.05	0.21
OTHER SOCIAL SCI	N/A	N/A	0.02	0.15
CHEMICAL ENG	N/A	N/A	0.05	0.22
CIVIL ENG	N/A	N/A	0.09	0.28
ELECTRICAL ENG	N/A	N/A	0.06	0.24
MECHANCIAL ENG	N/A	N/A	0.08	0.27
OTHER ENG	N/A	N/A	0.08	0.27
NON-SCIENCE/ENGINEERING	N/A	N/A	0.18	0.38

Table 3A: Means of Primary Work Activities by Occupation in the Full Sample

	Accounting/Finance	Applied Research	Basic Research	Computer Use	Design	Development	Employee Relations	Management	Other	Production	Professional Services	Quality Management	Sales	Teaching
Occupation:														
Administrative Support	0.239	0.013	0.008	0.179	0.003	0.014	0.042	0.107	0.182	0.045	0.079	0.026	0.053	0.009
Architecture/Eng	0.020	0.092	0.013	0.104	0.267	0.119	0.009	0.136	0.075	0.047	0.040	0.042	0.017	0.018
Arts/Design/Entertain	0.007	0.021	0.023	0.059	0.023	0.071	0.015	0.081	0.262	0.035	0.046	0.024	0.048	0.286
Business/Finance	0.360	0.014	0.004	0.050	0.009	0.015	0.099	0.223	0.044	0.018	0.047	0.035	0.053	0.030
Community/Social Service	0.008	0.019	0.009	0.019	0.001	0.014	0.056	0.132	0.289	0.005	0.342	0.007	0.003	0.097
Computer/Math	0.013	0.049	0.011	0.688	0.033	0.031	0.008	0.058	0.028	0.007	0.010	0.016	0.014	0.034
Education/Library	0.001	0.008	0.003	0.007	0.001	0.003	0.008	0.027	0.018	0.002	0.010	0.005	0.002	0.905
Farm/Fish/Forest	0.075	0.038	0.025	0.025	0.000	0.025	0.025	0.300	0.150	0.125	0.075	0.050	0.075	0.013
Food	0.024	0.000	0.000	0.008	0.000	0.033	0.114	0.130	0.244	0.106	0.008	0.049	0.252	0.033
Health	0.004	0.040	0.012	0.013	0.002	0.005	0.020	0.075	0.046	0.012	0.689	0.014	0.005	0.063
Legal	0.033	0.011	0.004	0.003	0.001	0.007	0.007	0.036	0.046	0.003	0.807	0.003	0.003	0.034
Life/Physical Science	0.007	0.344	0.164	0.034	0.010	0.074	0.007	0.083	0.072	0.027	0.058	0.036	0.004	0.081
Management	0.081	0.018	0.003	0.030	0.017	0.017	0.071	0.581	0.026	0.018	0.026	0.035	0.069	0.009
Other	0.056	0.053	0.016	0.054	0.013	0.035	0.047	0.127	0.168	0.072	0.097	0.038	0.048	0.177
Personal Care	0.036	0.019	0.013	0.036	0.013	0.013	0.071	0.124	0.221	0.094	0.149	0.053	0.078	0.081
Protective Services	0.018	0.022	0.012	0.052	0.002	0.015	0.131	0.175	0.293	0.023	0.203	0.022	0.000	0.033
Sales	0.040	0.014	0.004	0.030	0.006	0.011	0.019	0.073	0.030	0.008	0.052	0.007	0.701	0.004
Social Science	0.011	0.139	0.059	0.017	0.005	0.014	0.016	0.072	0.149	0.005	0.255	0.005	0.007	0.247
Trade	0.017	0.011	0.007	0.041	0.027	0.019	0.028	0.081	0.136	0.505	0.038	0.058	0.027	0.007

Table 3B: Means of Secondary Work Activities by Occupation in the Full Sample

	Accounting/Finance	Applied Research	Basic Research	Computer Use	Design	Development	Employee Relations	Management	None	Other	Production	Professional Services	Quality Management	Sales	Teaching
Occupation:															
Administrative Support	0.110	0.017	0.008	0.187	0.005	0.017	0.077	0.110	0.279	0.026	0.024	0.042	0.037	0.047	0.014
Architecture/Eng	0.045	0.085	0.024	0.151	0.153	0.124	0.032	0.150	0.063	0.019	0.037	0.022	0.057	0.027	0.013
Arts/Design/Entertain	0.021	0.040	0.058	0.079	0.026	0.074	0.055	0.169	0.206	0.072	0.025	0.012	0.052	0.052	0.060
Business/Finance	0.110	0.023	0.011	0.156	0.017	0.021	0.103	0.273	0.068	0.024	0.021	0.055	0.047	0.049	0.022
Community/Social Service	0.020	0.027	0.013	0.051	0.005	0.015	0.102	0.162	0.215	0.062	0.008	0.118	0.023	0.009	0.169
Computer/Math	0.048	0.091	0.030	0.131	0.127	0.080	0.037	0.161	0.159	0.017	0.017	0.016	0.036	0.022	0.030
Education/Library	0.012	0.050	0.038	0.088	0.013	0.070	0.055	0.139	0.400	0.055	0.005	0.017	0.020	0.004	0.034
Farm/Fish/Forest	0.075	0.038	0.013	0.075	0.000	0.050	0.075	0.213	0.088	0.025	0.138	0.000	0.125	0.075	0.013
Food	0.057	0.000	0.000	0.008	0.000	0.016	0.163	0.106	0.301	0.008	0.065	0.008	0.130	0.106	0.033
Health	0.012	0.070	0.026	0.045	0.004	0.015	0.068	0.149	0.209	0.020	0.011	0.096	0.045	0.016	0.214
Legal	0.174	0.035	0.021	0.031	0.003	0.027	0.063	0.274	0.228	0.028	0.002	0.066	0.011	0.016	0.020
Life/Physical Science	0.020	0.171	0.147	0.110	0.029	0.100	0.047	0.113	0.073	0.019	0.016	0.033	0.043	0.014	0.067
Management	0.108	0.026	0.006	0.060	0.029	0.026	0.194	0.236	0.025	0.023	0.036	0.041	0.077	0.088	0.027
Other	0.073	0.056	0.033	0.108	0.018	0.039	0.084	0.155	0.176	0.039	0.022	0.038	0.046	0.041	0.073
Personal Care	0.065	0.024	0.015	0.074	0.006	0.013	0.076	0.113	0.283	0.032	0.047	0.076	0.048	0.066	0.061
Protective Services	0.037	0.015	0.010	0.058	0.003	0.027	0.203	0.170	0.256	0.035	0.023	0.072	0.020	0.010	0.062
Sales	0.134	0.021	0.013	0.088	0.026	0.031	0.057	0.237	0.102	0.019	0.014	0.059	0.039	0.139	0.022
Social Science	0.021	0.124	0.091	0.055	0.008	0.032	0.052	0.168	0.161	0.049	0.005	0.083	0.019	0.008	0.126
Trade	0.036	0.013	0.015	0.073	0.043	0.031	0.060	0.108	0.328	0.017	0.085	0.014	0.106	0.046	0.026

Table 3C: Means of General Work Activities by Occupation in the Full Sample

	Accounting/Finance	Applied Research	Basic Research	Computer Use	Design	Development	Employee Relations	Management	Other	Production	Professional Services	Quality Management	Sales	Teaching
Occupation:														
Administrative Support	0.780	0.076	0.069	0.511	0.047	0.124	0.281	0.394	0.226	0.095	0.206	0.201	0.213	0.082
Architecture/Eng	0.473	0.393	0.152	0.539	0.666	0.468	0.238	0.520	0.107	0.152	0.122	0.340	0.140	0.093
Arts/Design/Entertain	0.819	0.186	0.192	0.322	0.130	0.332	0.321	0.466	0.361	0.097	0.256	0.240	0.223	0.417
Business/Finance	0.828	0.117	0.080	0.484	0.117	0.157	0.503	0.786	0.080	0.080	0.279	0.337	0.233	0.173
Community/Social Service	0.897	0.142	0.097	0.198	0.035	0.130	0.406	0.516	0.372	0.022	0.742	0.144	0.049	0.472
Computer/Math	0.348	0.304	0.147	0.944	0.392	0.267	0.225	0.414	0.053	0.052	0.075	0.237	0.096	0.151
Education/Library	0.973	0.174	0.148	0.227	0.093	0.221	0.205	0.288	0.085	0.021	0.088	0.095	0.037	0.971
Farm/Fish/Forest	0.788	0.175	0.113	0.325	0.163	0.275	0.400	0.788	0.175	0.388	0.200	0.488	0.388	0.100
Food	0.846	0.024	0.041	0.089	0.016	0.081	0.537	0.488	0.260	0.244	0.065	0.415	0.545	0.268
Health	0.932	0.287	0.150	0.193	0.047	0.125	0.362	0.433	0.074	0.047	0.915	0.256	0.086	0.489
Legal	0.977	0.106	0.076	0.123	0.019	0.113	0.312	0.523	0.076	0.007	0.961	0.099	0.052	0.108
Life/Physical Science	0.466	0.722	0.478	0.404	0.202	0.365	0.303	0.448	0.108	0.077	0.161	0.252	0.080	0.270
Management	0.780	0.188	0.090	0.418	0.225	0.253	0.763	0.984	0.072	0.132	0.242	0.559	0.384	0.229
Other	0.782	0.234	0.150	0.366	0.139	0.245	0.376	0.540	0.230	0.143	0.265	0.275	0.177	0.361
Personal Care	0.827	0.113	0.094	0.242	0.068	0.126	0.347	0.423	0.268	0.189	0.333	0.267	0.291	0.236
Protective Services	0.719	0.098	0.090	0.268	0.032	0.126	0.562	0.522	0.346	0.088	0.451	0.195	0.035	0.275
Sales	0.963	0.144	0.105	0.348	0.127	0.196	0.338	0.605	0.061	0.056	0.236	0.286	0.942	0.133
Social Science	0.847	0.447	0.289	0.237	0.086	0.167	0.291	0.466	0.215	0.016	0.483	0.116	0.043	0.505
Trade	0.507	0.085	0.069	0.236	0.161	0.162	0.254	0.341	0.166	0.721	0.097	0.337	0.159	0.111

Table 4A: Means of Primary Work Activities by Occupation in the Pooled SESTAT Sample

	Accounting/Finance	Applied Research	Basic Research	Computer Use	Design	Development	Employee Relations	Management	Other	Production	Professional Services	Quality Management	Sales	Teaching
Detailed Occupation:														
Biological/Medical Sci	0.006	0.409	0.215	0.018	0.006	0.052	0.006	0.085	0.074	0.011	0.079	0.025	0.004	0.008
Chemical Eng	0.016	0.106	0.011	0.062	0.278	0.179	0.010	0.129	0.049	0.057	0.022	0.049	0.032	0.001
Chemistry	0.005	0.350	0.050	0.028	0.011	0.169	0.008	0.093	0.083	0.053	0.030	0.103	0.015	0.003
Civil Eng	0.049	0.030	0.008	0.054	0.286	0.025	0.008	0.266	0.098	0.016	0.098	0.041	0.020	0.001
Computer/Math Sci	0.014	0.045	0.007	0.670	0.047	0.034	0.009	0.082	0.030	0.007	0.010	0.019	0.021	0.005
Economics	0.088	0.247	0.027	0.068	0.025	0.036	0.011	0.090	0.151	0.003	0.134	0.014	0.104	0.003
Electrical Eng	0.019	0.094	0.009	0.149	0.281	0.160	0.005	0.124	0.053	0.036	0.021	0.023	0.024	0.002
Engineering	0.021	0.086	0.013	0.108	0.178	0.111	0.009	0.148	0.091	0.043	0.044	0.059	0.084	0.005
Life Sci	0.018	0.289	0.062	0.044	0.016	0.061	0.018	0.175	0.125	0.036	0.065	0.055	0.027	0.009
Mechanical Eng	0.018	0.057	0.009	0.055	0.410	0.155	0.005	0.141	0.048	0.037	0.020	0.029	0.015	0.002
Non-sci/eng	0.033	0.033	0.013	0.131	0.017	0.020	0.022	0.101	0.098	0.054	0.285	0.020	0.152	0.020
Other Management	0.258	0.016	0.005	0.058	0.019	0.021	0.122	0.224	0.059	0.014	0.072	0.045	0.073	0.014
Other Social Sci	0.016	0.358	0.073	0.024	0.012	0.016	0.033	0.126	0.126	0.008	0.122	0.008	0.016	0.061
Physical Sci	0.021	0.336	0.069	0.085	0.027	0.050	0.007	0.125	0.139	0.015	0.099	0.014	0.010	0.003
Physics/Astronomy	0.022	0.354	0.095	0.073	0.076	0.123	0.006	0.070	0.041	0.016	0.076	0.028	0.006	0.013
Post-secondary Teaching	0.004	0.029	0.041	0.010	0.002	0.007	0.011	0.031	0.015	0.001	0.022	0.004	0.002	0.820
Psychology	0.007	0.038	0.004	0.006	0.003	0.002	0.022	0.050	0.218	0.001	0.622	0.006	0.003	0.017
Top-/Mid-management	0.054	0.020	0.003	0.038	0.020	0.024	0.051	0.608	0.028	0.016	0.028	0.036	0.070	0.005
Broad Occuption:														
Computer/Math	0.013	0.045	0.010	0.646	0.045	0.032	0.009	0.080	0.029	0.006	0.010	0.018	0.020	0.035
Engineering	0.024	0.075	0.011	0.096	0.269	0.121	0.007	0.157	0.071	0.037	0.040	0.041	0.042	0.009
Life Sci	0.010	0.318	0.154	0.025	0.009	0.047	0.010	0.110	0.082	0.017	0.079	0.031	0.011	0.096
Non-sci/eng	0.059	0.026	0.010	0.087	0.017	0.020	0.039	0.242	0.067	0.035	0.169	0.026	0.108	0.095
Physical Sci	0.012	0.326	0.072	0.051	0.022	0.112	0.007	0.098	0.095	0.033	0.057	0.058	0.011	0.046
Social Sci	0.023	0.122	0.031	0.021	0.008	0.011	0.020	0.066	0.164	0.002	0.375	0.007	0.024	0.126

Table 4B: Means of Secondary Work Activities by Occupation in the Pooled SESTAT Sample

	Accounting/Finance	Applied Research	Basic Research	Computer Use	Design	Development	Employee Relations	Management	None	Other	Production	Professional Services	Quality Management	Sales	Teaching
Detailed Occupation:															
Biological/Medical Sci	0.023	0.199	0.165	0.086	0.023	0.069	0.043	0.158	0.081	0.019	0.010	0.037	0.031	0.020	0.036
Chemical Eng	0.028	0.098	0.016	0.097	0.187	0.167	0.028	0.132	0.049	0.023	0.048	0.013	0.075	0.031	0.008
Chemistry	0.012	0.166	0.089	0.112	0.031	0.169	0.033	0.119	0.082	0.016	0.025	0.015	0.096	0.029	0.008
Civil Eng	0.114	0.037	0.011	0.113	0.115	0.038	0.039	0.240	0.072	0.018	0.018	0.059	0.079	0.040	0.004
Computer/Math Sci	0.047	0.078	0.021	0.151	0.150	0.074	0.036	0.157	0.149	0.012	0.013	0.014	0.040	0.036	0.023
Economics	0.121	0.107	0.055	0.126	0.030	0.055	0.038	0.151	0.077	0.036	0.005	0.090	0.019	0.077	0.014
Electrical Eng	0.038	0.081	0.021	0.188	0.185	0.141	0.025	0.128	0.059	0.012	0.033	0.011	0.035	0.038	0.006
Engineering	0.054	0.077	0.020	0.138	0.139	0.107	0.034	0.150	0.074	0.023	0.035	0.026	0.069	0.043	0.011
Life Sci	0.047	0.130	0.076	0.100	0.033	0.092	0.058	0.165	0.071	0.032	0.027	0.028	0.062	0.044	0.036
Mechanical Eng	0.042	0.070	0.015	0.099	0.200	0.176	0.026	0.155	0.062	0.011	0.041	0.012	0.045	0.039	0.006
Non-sci/eng	0.067	0.044	0.021	0.082	0.033	0.033	0.061	0.168	0.196	0.024	0.023	0.067	0.043	0.065	0.075
Other Management	0.119	0.022	0.009	0.128	0.033	0.023	0.107	0.226	0.069	0.021	0.019	0.062	0.055	0.089	0.019
Other Social Sci	0.024	0.142	0.093	0.102	0.008	0.057	0.061	0.199	0.098	0.049	0.012	0.061	0.033	0.024	0.037
Physical Sci	0.058	0.153	0.080	0.157	0.029	0.071	0.031	0.156	0.084	0.021	0.014	0.049	0.041	0.043	0.014
Physics/Astronomy	0.025	0.177	0.101	0.152	0.076	0.136	0.022	0.120	0.032	0.016	0.016	0.035	0.060	0.013	0.019
Post-secondary Teaching	0.014	0.083	0.061	0.102	0.013	0.042	0.046	0.167	0.264	0.048	0.003	0.047	0.012	0.007	0.093
Psychology	0.010	0.049	0.021	0.049	0.005	0.023	0.077	0.134	0.264	0.047	0.002	0.161	0.026	0.014	0.117
Top-/Mid-management	0.104	0.029	0.005	0.068	0.046	0.037	0.169	0.208	0.020	0.021	0.031	0.043	0.090	0.110	0.018
Broad Occuption:															
Computer/Math	0.046	0.080	0.023	0.154	0.145	0.073	0.037	0.154	0.149	0.013	0.013	0.014	0.038	0.034	0.027
Engineering	0.055	0.072	0.018	0.137	0.160	0.121	0.031	0.159	0.067	0.017	0.033	0.024	0.057	0.040	0.009
Life Sci	0.031	0.168	0.120	0.083	0.024	0.069	0.047	0.159	0.084	0.022	0.014	0.051	0.037	0.026	0.066
Non-sci/eng	0.077	0.039	0.018	0.084	0.035	0.034	0.093	0.186	0.146	0.025	0.023	0.057	0.054	0.074	0.053
Physical Sci	0.030	0.157	0.094	0.130	0.032	0.120	0.032	0.132	0.082	0.019	0.018	0.028	0.067	0.031	0.028
Social Sci	0.033	0.089	0.052	0.072	0.010	0.039	0.062	0.139	0.190	0.047	0.004	0.122	0.023	0.025	0.092

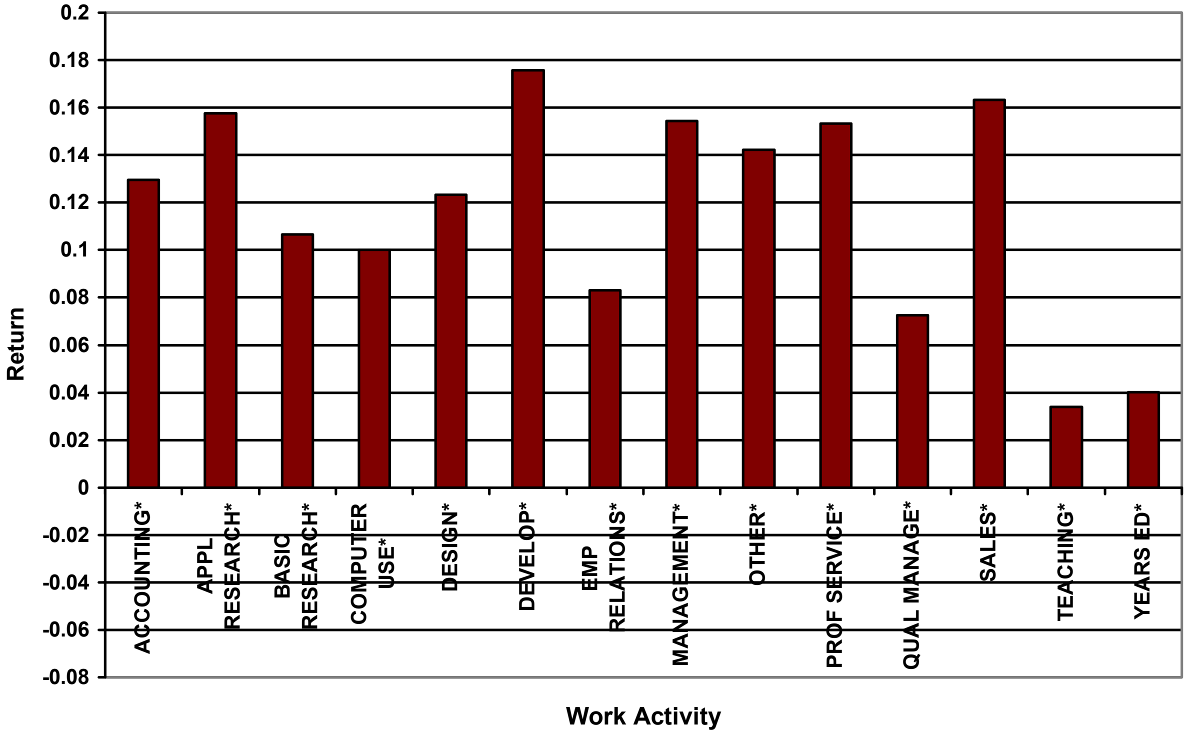
Table 4C: Means of General Work Activities by Occupation in the Pooled SESTAT Sample

	Accounting/Finance	Applied Research	Basic Research	Computer Use	Design	Development	Employee Relations	Management	Other	Production	Professional Services	Quality Management	Sales	Teaching
Detailed Occupation:														
Biological/Medical Sci	0.238	0.770	0.520	0.357	0.160	0.309	0.311	0.494	0.112	0.049	0.196	0.193	0.103	0.227
Chemical Eng	0.271	0.440	0.113	0.395	0.737	0.590	0.238	0.492	0.084	0.193	0.066	0.381	0.165	0.058
Chemistry	0.193	0.722	0.301	0.376	0.221	0.571	0.244	0.434	0.111	0.132	0.076	0.417	0.137	0.087
Civil Eng	0.559	0.177	0.087	0.430	0.586	0.190	0.335	0.742	0.129	0.084	0.284	0.387	0.219	0.057
Computer/Math Sci	0.241	0.273	0.116	0.949	0.433	0.264	0.242	0.422	0.050	0.045	0.065	0.236	0.145	0.115
Economics	0.532	0.493	0.145	0.449	0.192	0.249	0.244	0.521	0.222	0.019	0.375	0.132	0.304	0.101
Electrical Eng	0.282	0.409	0.137	0.640	0.730	0.529	0.213	0.469	0.073	0.128	0.058	0.240	0.172	0.063
Engineering	0.381	0.361	0.125	0.488	0.569	0.431	0.247	0.523	0.126	0.147	0.115	0.352	0.238	0.084
Life Sci	0.376	0.573	0.262	0.373	0.171	0.345	0.367	0.599	0.179	0.115	0.166	0.369	0.192	0.143
Mechanical Eng	0.291	0.361	0.111	0.410	0.824	0.573	0.213	0.520	0.069	0.154	0.069	0.294	0.175	0.060
Non-sci/eng	0.431	0.179	0.104	0.360	0.135	0.161	0.309	0.463	0.135	0.112	0.450	0.226	0.330	0.222
Other Management	0.662	0.119	0.066	0.434	0.174	0.169	0.518	0.709	0.093	0.074	0.283	0.347	0.343	0.148
Other Social Sci	0.439	0.687	0.337	0.350	0.146	0.211	0.370	0.593	0.207	0.037	0.280	0.215	0.118	0.236
Physical Sci	0.354	0.682	0.254	0.469	0.221	0.271	0.248	0.528	0.187	0.057	0.221	0.232	0.194	0.092
Physics/Astronomy	0.250	0.785	0.370	0.589	0.528	0.491	0.180	0.453	0.082	0.060	0.171	0.177	0.089	0.142
Post-secondary Teaching	0.386	0.268	0.230	0.298	0.105	0.195	0.237	0.387	0.078	0.017	0.175	0.082	0.065	0.969
Psychology	0.396	0.189	0.091	0.138	0.061	0.112	0.329	0.347	0.277	0.004	0.902	0.117	0.064	0.326
Top-/Mid-management	0.634	0.195	0.081	0.404	0.295	0.271	0.740	0.974	0.070	0.125	0.214	0.548	0.456	0.168
Broad Occuption:														
Computer/Math	0.246	0.275	0.123	0.933	0.420	0.262	0.240	0.417	0.051	0.043	0.066	0.229	0.141	0.147
Engineering	0.361	0.350	0.120	0.496	0.668	0.453	0.245	0.541	0.100	0.136	0.115	0.318	0.201	0.075
Life Sci	0.309	0.665	0.416	0.347	0.151	0.299	0.335	0.537	0.124	0.064	0.222	0.232	0.123	0.320
Non-sci/eng	0.505	0.179	0.100	0.370	0.179	0.194	0.438	0.617	0.108	0.103	0.343	0.311	0.340	0.270
Physical Sci	0.266	0.692	0.307	0.429	0.244	0.425	0.241	0.474	0.132	0.090	0.136	0.305	0.146	0.151
Social Sci	0.427	0.356	0.181	0.241	0.101	0.164	0.305	0.413	0.233	0.011	0.622	0.121	0.115	0.364

Table 5: Female and Male Residual Wage Inequality Measures

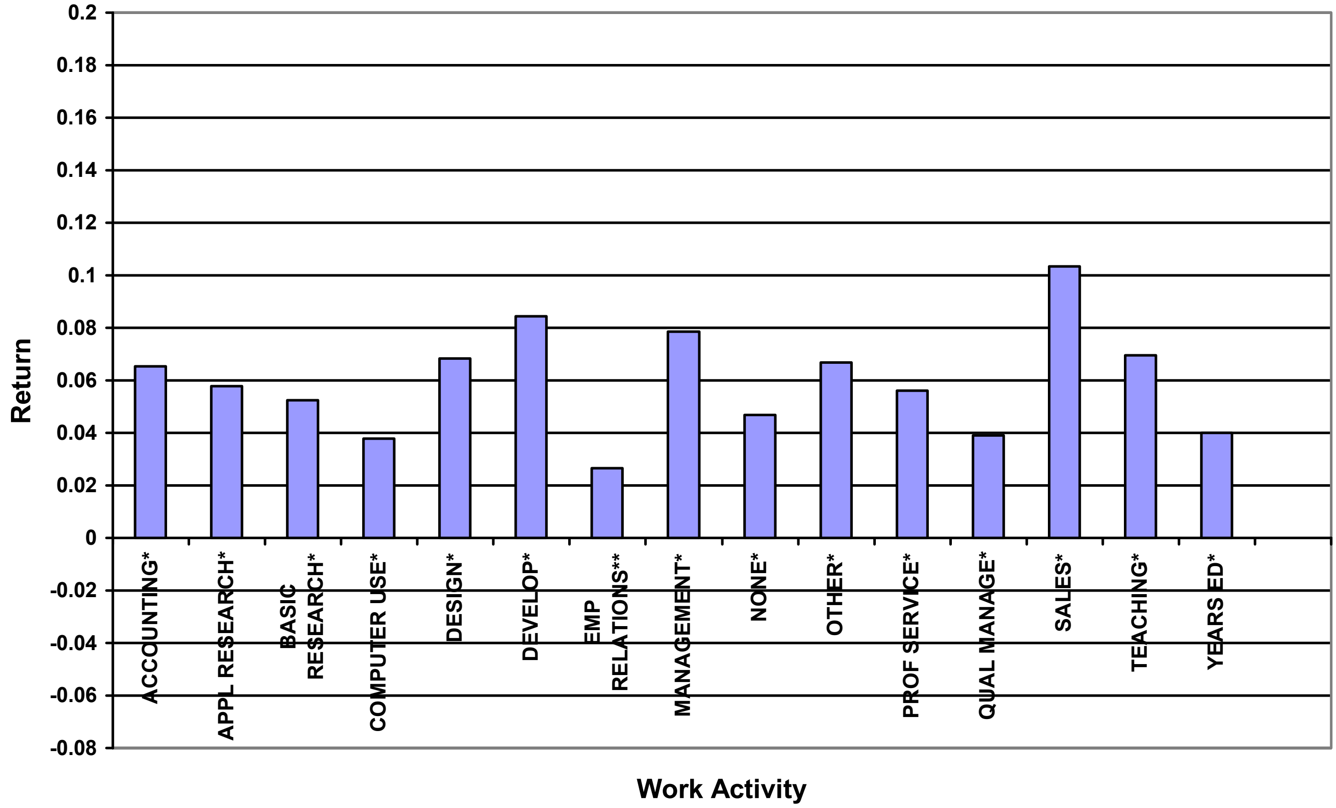
	With Work Activities		Without Work Activities		Standard Deviation Percent Difference	90-10 Differential Percent Difference
	Standard Deviation	90-10 Differential	Standard Deviation	90-10 Differential		
Females:						
Full sample	0.387	1.395	0.393	1.411	-1.4%	-1.1%
Non-science sample	0.406	1.384	0.411	1.392	-1.1%	-0.6%
SESTAT sample	0.361	1.372	0.367	1.393	-1.7%	-1.5%
Males:						
Full sample	0.384	0.803	0.390	0.795	-1.6%	1.0%
Non-science sample	0.402	0.806	0.408	0.798	-1.4%	0.9%
SESTAT sample	0.356	0.831	0.362	0.829	-1.8%	0.3%

Figure 1: Returns to Primary Work Activities in the Full Sample***



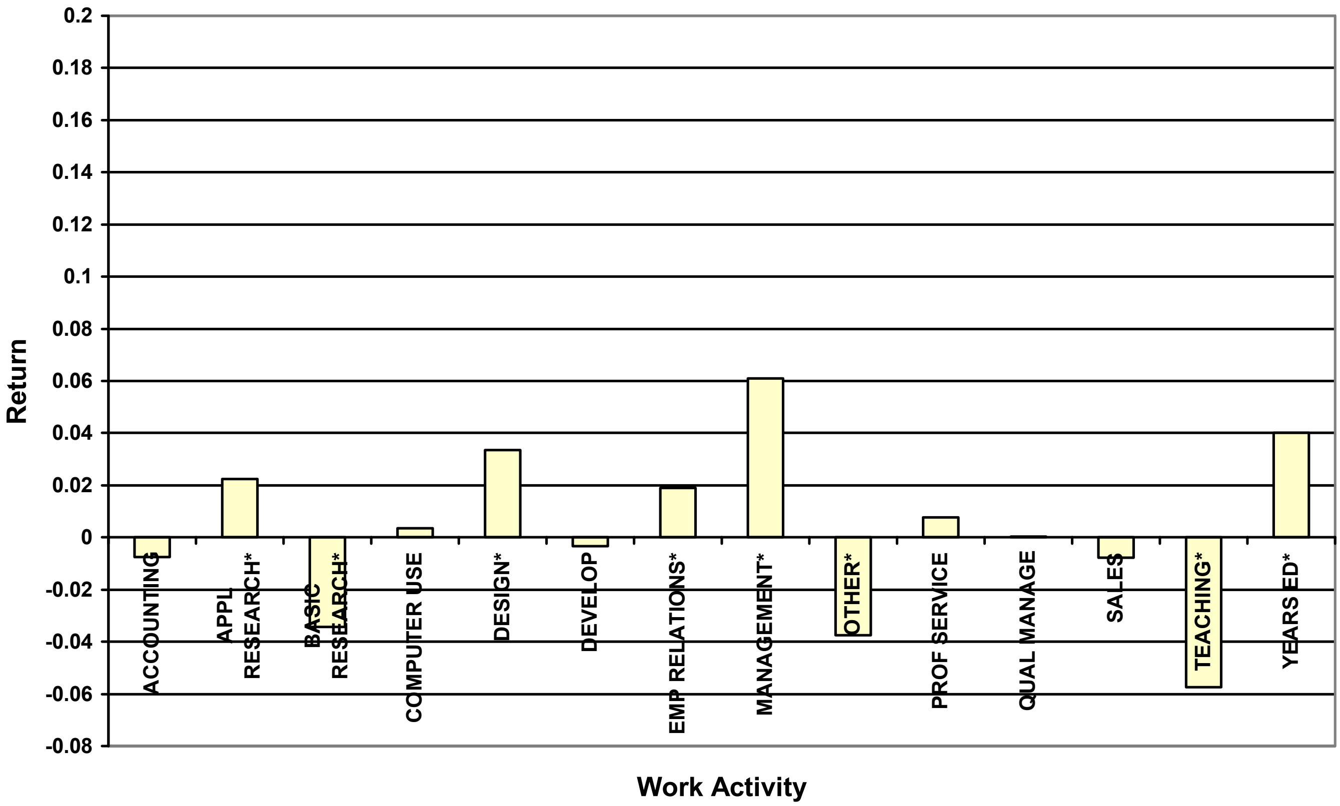
* Statistically significant at the 1% level
** Statistically significant at the 5% level
*** Results are from OLS regressions using the 1993 NSCG full sample. Years of education is included for reference. Production is the omitted work activity.

Figure 2: Returns to Secondary Work Activities in the Full Sample***



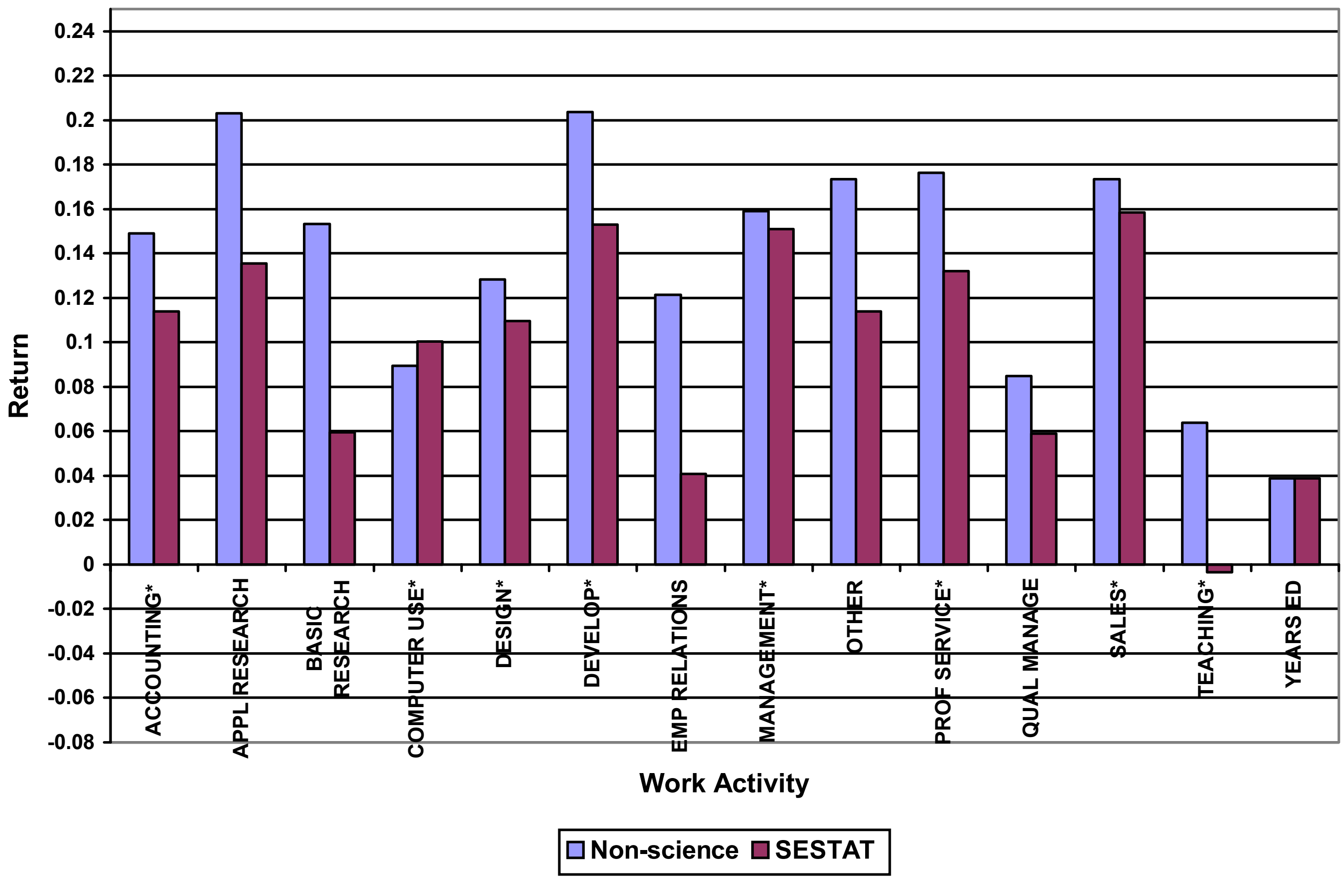
* Statistically significant at the 1% level
** Statistically significant at the 5% level
*** Results are from OLS regressions using the 1993 NSCG full sample. Years of education is included for reference. Production is the omitted work activity.

Figure 3: Returns to General Work Activities in the Full Sample***



* Statistically significant at the 1% level
** Statistically significant at the 5% level
*** Results are from OLS regressions using the 1993 NSCG full sample. Years of education is included for reference. Production is the omitted work activity.

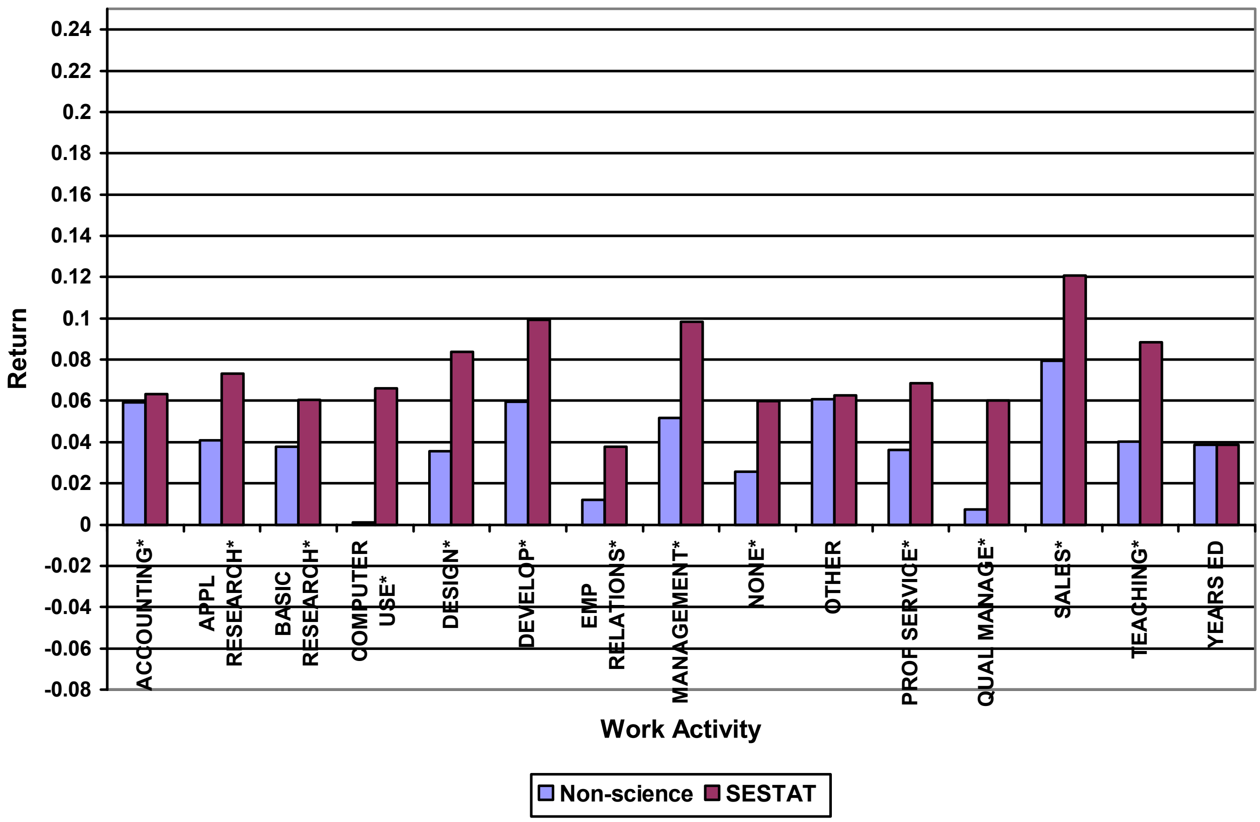
Figure 4: Returns to Primary Work Activities in the Non-science and SESTAT Samples**



* The difference in returns between the 1993 non-science and 1993 SESTAT samples is statistically significant at the 1% level

** Results are from OLS regressions using the 1993 non-science and 1993 SESTAT samples. Years of education is included for reference. Production is the omitted work activity.

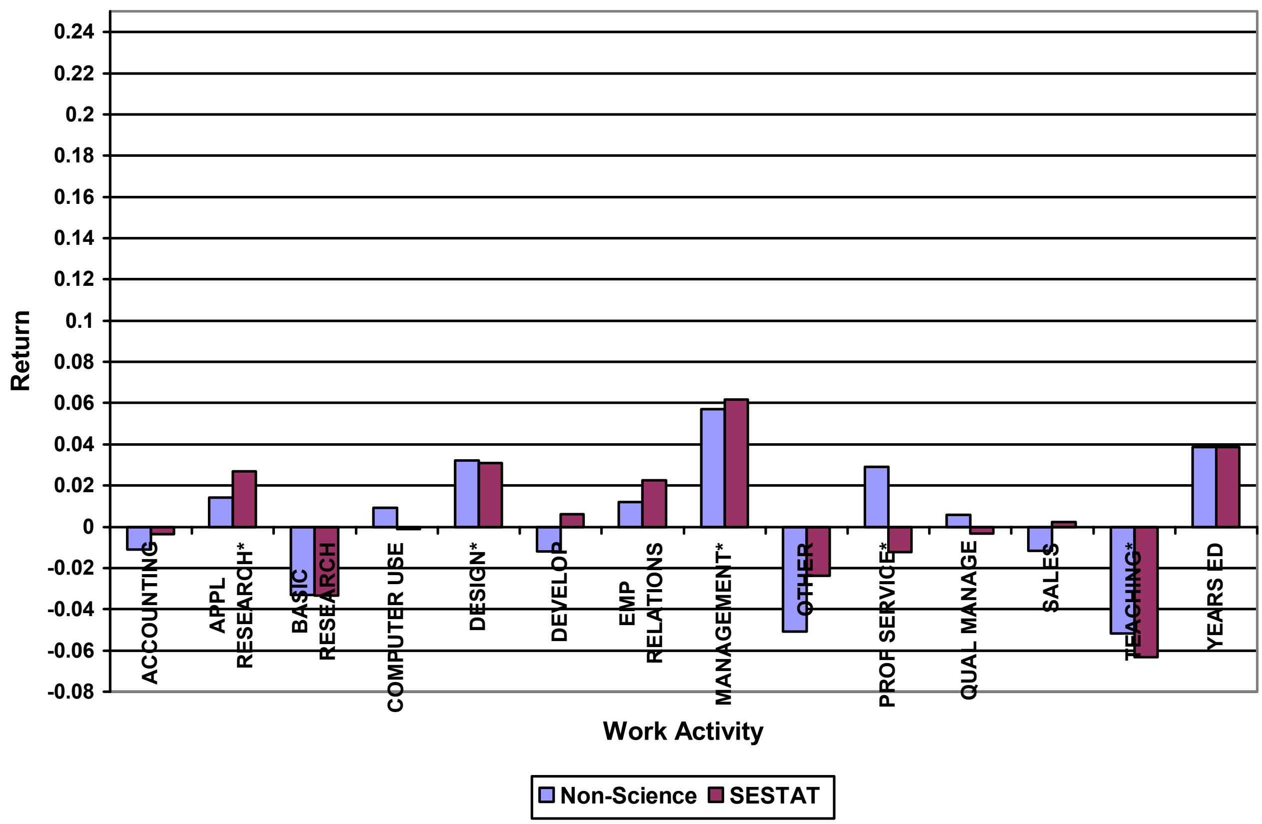
Figure 5: Returns to Secondary Work Activities in the Non-science and SESTAT Samples**



* The difference in returns between the 1993 non-science and 1993 SESTAT samples is statistically significant at the 1% level

** Results are from OLS regressions using the 1993 non-science and 1993 SESTAT samples. Years of education is included for reference. Production is the omitted work activity.

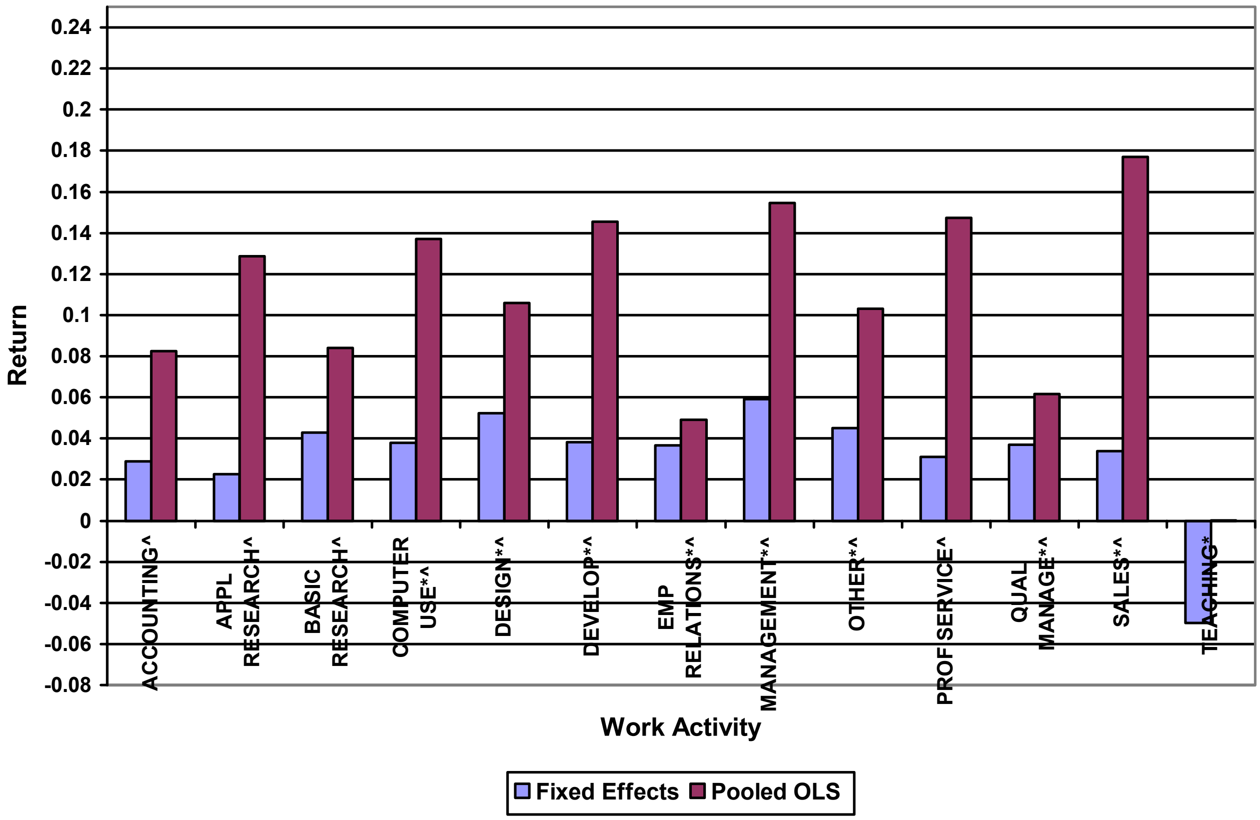
Figure 6: Returns to General Work Activities in the Non-science and SESTAT Samples**



* The difference in returns between the 1993 non-science and 1993 SESTAT samples is statistically significant at the 1% level

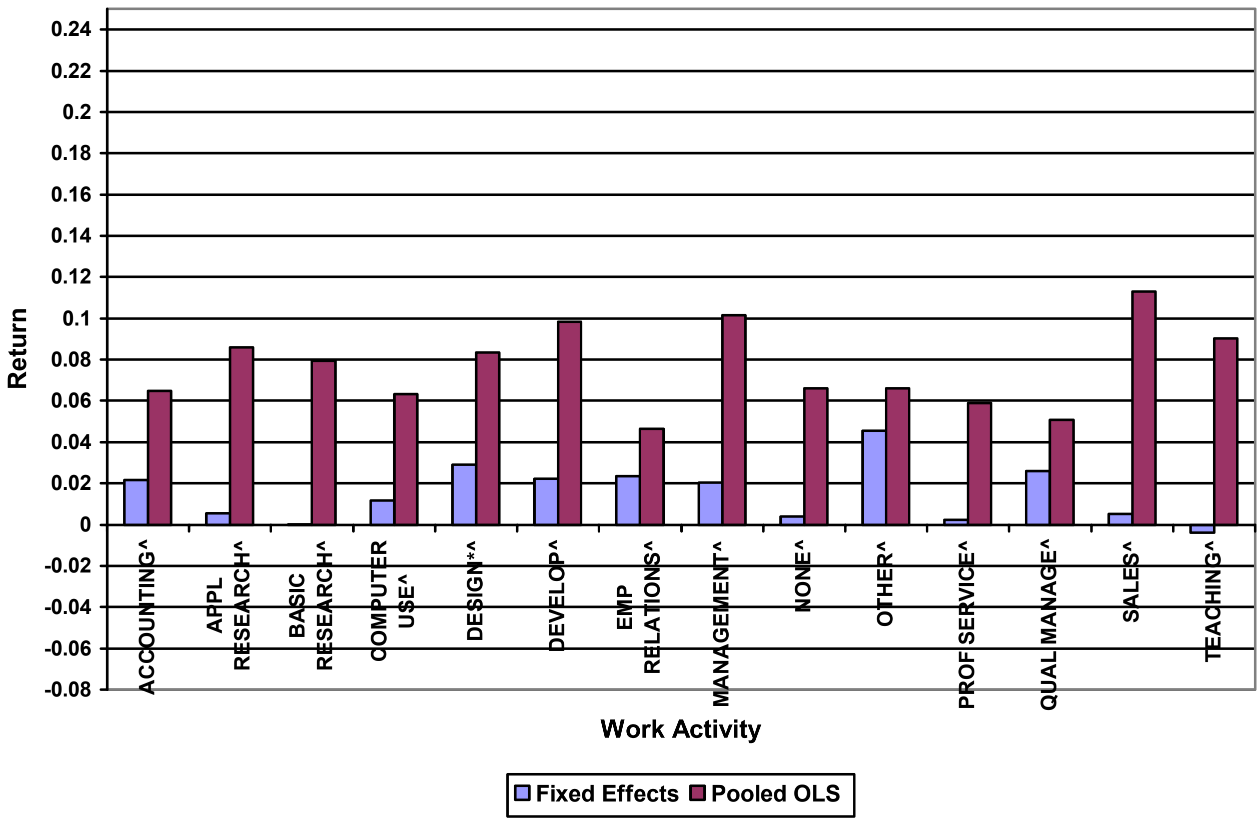
** Results are from OLS regressions using the 1993 non-science and 1993 SESTAT samples. Years of education is included for reference. Production is the omitted work activity.

Figure 7: Returns to Primary Work Activities in the Fixed Effects and Pooled OLS Models**



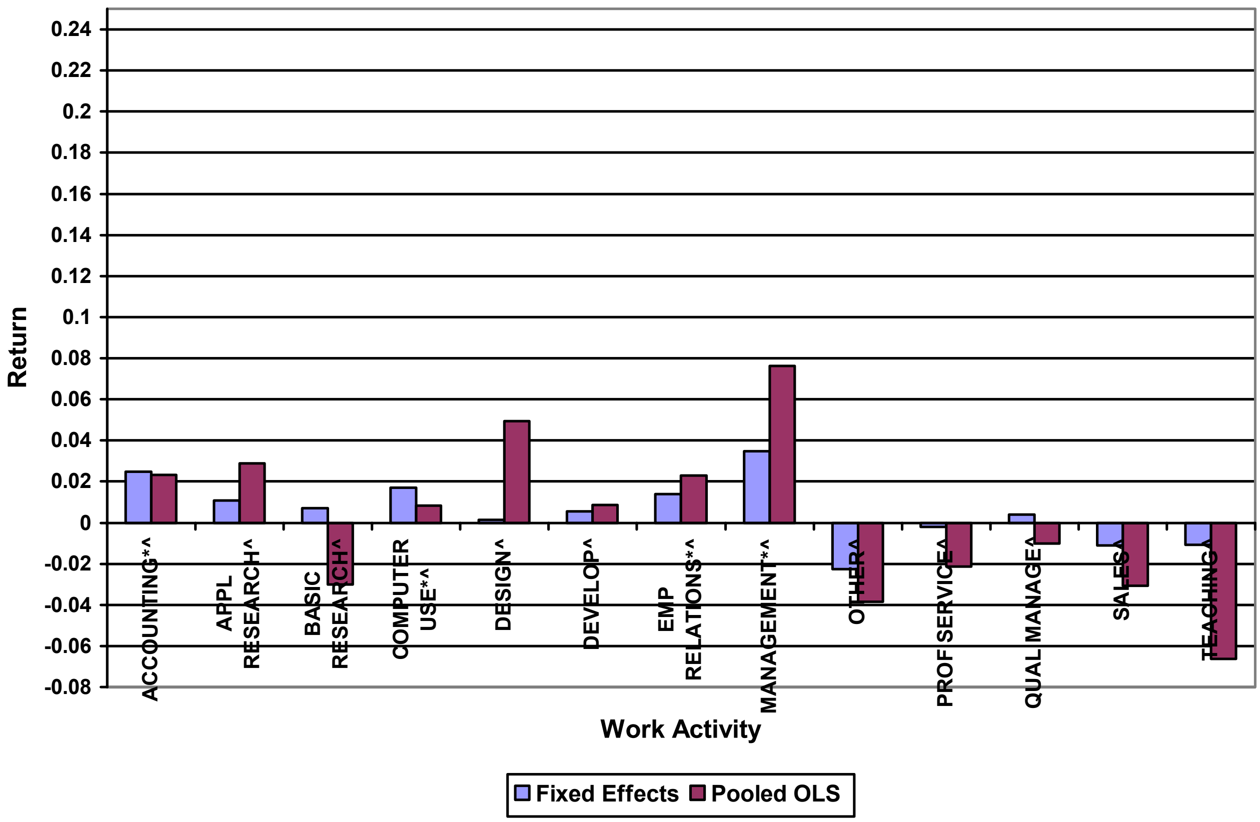
* Statistically significant at the 5% level in the fixed effects model
^ Statistically significant at the 5% level in the pooled OLS model
** Results are from a fixed effects regression using the 1993-1997 SESTAT panel sample of job changers and a pooled OLS regression using the 1993-1999 pooled SESTAT sample. Production is the omitted work activity.

Figure 8: Returns to Secondary Work Activities in the Fixed Effects and Pooled OLS Models**



* Statistically significant at the 5% level in the fixed effects model
^ Statistically significant at the 5% level in the pooled OLS model
** Results are from a fixed effects regression using the 1993-1997 SESTAT panel sample of job changers and a pooled OLS regression using the 1993-1999 pooled SESTAT sample. Production is the omitted work activity.

Figure 9: Returns to General Work Activities in the Fixed Effects and Pooled OLS Models**



* Statistically significant at the 5% level in the fixed effects model
^ Statistically significant at the 5% level in the pooled OLS model
** Results are from a fixed effects regression using the 1993-1997 SESTAT panel sample of job changers and a pooled OLS regression using the 1993-1999 pooled SESTAT sample. Production is the omitted work activity.