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Are Good Jobs Disappearing in the US?

This paper is a revised version of Chapter 2 of our book, *Where Are All the Good Jobs Going?* Russell Sage Foundation, 2011

Are good jobs really disappearing in America, as many notable authors and commentators (like Lou Dobbs and Harold Meyerson, among others) frequently suggest?

Any discussion of job quality and volatility must begin with the question of how we measure this quality in the first place. The previous chapter lays out a few different definitions of "good jobs" and suggests a variety of ways in which they might be measured. It also raises important questions about exactly which workers fill these jobs, and how the availability and nature of the jobs themselves (as well as the workers hired into them) might be evolving over time.

This chapter seeks to shed some light on these questions. We begin with a more complete discussion of the data that we use to answer them – including how the data were constructed, and their strengths and limitations. We present our own definition of "good jobs" and the indicators by which we measure them. We then present the characteristics of the firms in which these and other jobs appear – in terms of industry, size, and other measures of firm performance such as worker turnover; as well as the characteristics of workers – in terms of age, race and gender, education and earnings capacity – who are hired into these different kinds of jobs.

Having established the average characteristics of "good jobs" and the workers who fill them, we address the key question of how these jobs and workers are changing over time. We show the extent to which good jobs are growing over time, relative to others in the labor market. We show how the characteristics of these jobs are changing – especially the industries in which they appear. We consider whether the ability of less-skilled workers to obtain these jobs is diminishing, and also how wage premia and pay structures within these firms are evolving.

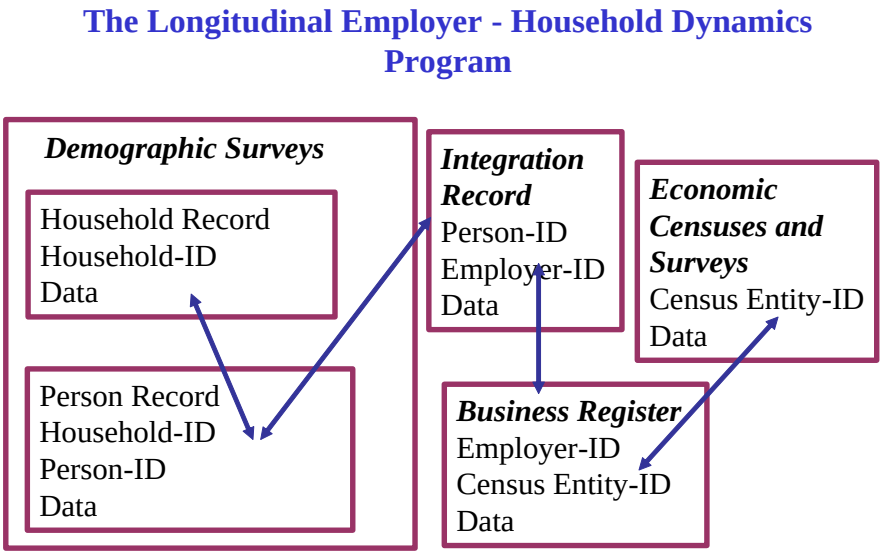
In the end, we show that *good jobs remain plentiful in America – but they are becoming harder for workers with limited skilled and education to obtain*. Levels and trends in job volatility (as opposed to quality), and how they play out in local labor markets, are discussed in other chapters below. All of these

findings will have important implications for policies that aim to affect the job structure as well as the skills of workers, which we flesh out more fully in the final chapter below.

THE LEHD DATA: WORKER AND FIRM "EFFECTS" OVER TIME

In the previous chapter, we briefly described the LEHD data at the U.S. Census Bureau that we use to measure good jobs and the workers who fill them. Now it is time to take a closer look at these data, and how we use them to measure job and worker quality and volatility around the country and over time.

The LEHD program was established at the Census Bureau in 1998 in response to the need to provide more information on economic dynamics. The program draws on already existing survey and administrative data from both the demographic and economics directorates at the Bureau, and integrates them with Unemployment Insurance wage record data from our partner states – which, at this point, include over 40 states nationwide (though many joined on a rolling basis throughout the 1990s and into the 2000s). This integration, which takes place under strict confidentiality protection protocols, appears diagrammatically below.



Briefly, state unemployment insurance (UI) wage records sit at the core of these data. These records, which consist of quarterly reports filed by employers every quarter for each individual in covered employment, permit the construction of a database that provides longitudinal information on workers, firms, and the match between the two. The coverage is roughly 96% of private non-farm wage and salary employment; the coverage of agricultural and federal government employment is less comprehensive. Self-employed individuals and independent contractors are also not covered, while certain categories of very low-wage workers (especially those working sporadically, part-time or "off the books) will be heavily underrepresented here as well. Although the administrative records themselves are subject to some error, staff at the LEHD program has invested substantial resources in cleaning the records and making them internally consistent.[1]

The Census Bureau information used in this study consists primarily of basic demographic information: date of birth, place of birth, sex and a crude measure of race and ethnicity. These are available for almost all workers in the dataset – the non-match rate is about 4%. The UI wage records have also been matched with the Decennial Census of Population and other household and employer surveys at the Census Bureau, but since these other data are purely cross-sectional we use them mostly to supplement our analysis based on the more extensive LEHD longitudinal data.

There are clearly many advantages associated with this integrated data base – its enormous sample size, longitudinal structure, and information on employer-employee matches. There are also some disadvantages. One is that hours or weeks worked are typically not reported by employers, so that we cannot measure hourly or weekly earnings and cannot easily distinguish between low wages and few hours worked as sources of low quarterly or annual earnings. Another is that it is impossible to identify whether, when multiple jobs are held within a quarter, they are held sequentially or at the same time. And

[1] The approach is described in John Abowd and Lars Vilhuber (2003).

we have no direct information on why workers leave jobs, or on a range of personal characteristics (beyond basic demographics) that the survey data usually capture.

There are two additional conceptual issues to be addressed. Although we typically refer to the employer as a "firm," the actual reporting unit in the data is an administrative, rather than an economic entity; in other words, the filing unit reflects an "Employer Identification Number," or EIN, rather than a specific firm. The distinction is immaterial for about 70% of workers, who work for a single establishment employer – but for those who work for a multiple establishment employer, it is really not clear whether they are working for the "firm" or an establishment. But, given that establishments within the same firm sometimes have different EINs, the opening and closing of establishments within firms might cause us to overstate firm births and deaths – an issue to which we return when we analyze firm dynamics and their relationship to job growth in Table 5.

The other conceptual issue is that of earnings. According to the *BLS Handbook of Methods* (1997) UI wage records measure "gross wages and salaries, bonuses, stock options, tips, and other gratuities, and the value of meals and lodging, where supplied." They do not include employer contributions to Social Security, health insurance, workers compensation, unemployment insurance, and private pension and welfare funds.

The primary benefit of these data – in addition to the enormous sample sizes and coverage that they provide – is that longitudinal data on both workers and employers enable us to estimate what economists call fixed effects for every worker and every firm. It is clear that both who one is and where one works are important determinants of one's earnings. However, because it is so difficult to accurately and completely measure individual and firm characteristics, most previous research has been forced to rely on relatively crude proxies – such as years of education to measure a person's skills, or firm size and industry to measure the firm's ability or willingness to pay. In this book we take advantage of work done

at the LEHD program[2] that explicitly calculates the skills and other permanent characteristics embodied in each individual in the dataset, as well as the firm's contribution to pay. We refer to these as the person and firm "fixed effects" in the rest of the book, and discuss their construction in more detail here.

The person fixed effects can be thought of as the market value of the portable component of an individual's skills and attitudes. They have two components: an individual or person effect, which does not vary over time; and a component based on labor market experience. The individual effect includes some factors that are often observable to the statistician, such as years of education and sex; and some factors that are often not, such as innate ability, "people skills," "problem solving skills," perseverance, family background, and educational quality. The experience component is directly calculated from the data, and, as such, is left-censored at the start of the data period. This left-censoring is ameliorated by estimating the number of years of labor force experience an individual accumulates prior to the first appearance in the data.

The intuitive explanation of the person fixed effect is that it captures the average market value that employers assign an individual as that individual moves from firm to firm. Note that this measure is not some arbitrary skill measure – like years of education or occupation – that may or may not be the correct measure of how the market values skills. If, for example, an individual is a highly "skilled" blacksmith, and the market does not value this skill, the person effect will be correspondingly low. If the individual is physically extremely strong, and this is of decreasing value in the marketplace, the individual will also have a relatively low person effect. But if, for example, the individual scores highly on problem-solving skills, and this is valued in the market place, then s/he will have a high person effect. As such, these are likely to be "better" measures of skills in a more complex economy. Indeed, the case study evidence (e.g.,

[2] See Abowd, Lengermann and McKinney (2003).

Appelbaum *et. al*., 2003) suggests that years of education are simply not adequate measures of human capital in a service economy.

The firm fixed effect similarly captures a variety of factors. Most simplistically, it captures the premium or discount that a given firm pays workers on average, controlling for their individual skills and characteristics. This premium might be due to a higher level of capital in the firm, which would clearly increase the productivity of individual workers. Or, it might be due to unionization – the transportation equipment industry, for example, has a relatively high average firm fixed effect. It might also be what economists call a "compensating differential" for unattractive working conditions – for instance, the high average firm fixed effect in the mining industry is presumably in order to compensate workers for the riskiness and unpleasantness of mine work. Finally, the firm effect will capture a range of human resource policies chosen by the firm, including the effects of training and promotion policies as well as compensation.

Which states and years of the LEHD micro data have been used for this study, and why were they chosen? We were interested in generating a broad and fairly representative sample of states for which data were available over a lengthy period of time, including much or most of the 1990s. Since states joined the LEHD project on a rolling basis throughout that decade, data were not available for many states that would cover this period. And the LEHD micro data have not been fully processed beyond 2003, limiting how recent our analysis of labor market trends could be.

Within the period of time that we are able to study, we also wanted to separately analyze at least three distinct subperiods, reflecting different macroeconomic and labor market environments during that time: 1) The early-to-mid 1990s, during which the economy was slowly recovering from the mild recession of the 1990; 2) The mid-to-late 1990s, a period of extraordinary strength and growth in the US economy (often referred to as "the Roaring Nineties" or the "Great Boom"); and 3) The period of 2000 and beyond,

during which the economy slowed and then entered another recession, from which the labor market did not really recover until 2004 and beyond.

In the end, we decided to focus on 12 states for which we have data over the period 1992-2003. These states are California, Colorado, Idaho, Illinois, Kansas, Maryland, Missouri, North Carolina, Oregon, Pennsylvania, Washington and Wisconsin. These states are distributed across all regions of the country, include both larger and smaller ones, with more and fewer major metropolitan areas (as we note in Chapter 4), and represent a wide range of economic and industrial characteristics. We also divide the entire period into three subperiods of equal length: 1992-95, 1996-99, and 2000-03, which largely represent the three subperiods described above.

For every firm and every individual worker that appears in these states during this time period (and which meet various other sampling criteria), we have estimated person and firm "fixed effects"; and these measures will constitute our primary measures of *worker quality* and *job quality* respectively. The details of our estimation procedures appear in an Appendix to this chapter.

Importantly, we calculate firm and worker effects for our entire 12-year period of study and separately for each of our three 4-year subperiods – to allow for the fact that firms can (and often do) adjust their human resource and compensation policies, especially in response to changing production needs and labor market situations; while workers can also improve their earnings capacity through the acquisition of more skill. If firms change production techniques (the acquisition and/or relinquishing of specific plants and sites, the adoption or removal of specific products or services, the adoption of new technologies, the outsourcing and "offshoring" of work to other companies and countries, and the workplace reorganizations that these choices generate), they might well change their hiring practices and compensation policies in important ways as well. Our measures of firm pay, at least potentially, should reflect these changing realities and firm responses to them. Similarly, workers can improve their earnings

capabilities with improved education and training (both formal and informal) and skills acquired through new or ongoing work experience. Having three different firm effects at different points in time allows us to analyze how pay policies are evolving over time, and how the "matching" of workers with different ability levels to firms might evolve as well. Finally, we include in our analysis all new firms that are "born" during these periods as well as those that shut down or "die"; and all workers who either join the labor force or leave it. Thus, the extent to which worker skill and job availability are affected by the dynamics of both will be captured here.

At the same time, we note the potential limitations of our measures. As we have already indicated, there are dimensions to earnings that our measures miss – such as fringe benefits and the effects of other employer practices. As a single measure based on the level of earnings during a fixed number of years, the firm effect does not itself capture potential promotion possibilities for its workers over time – which, according to the standard economic theory of "human capital," might be negatively related to starting wage levels. However, our own earlier work and that of other authors suggests that, if anything, these other dimensions of firm pay are mostly positively correlated with our firm effects.[3] We briefly provide some information below on this and other measures of worker compensation (like turnover rates and within-firm inequality) that we think are additional measures of firm and job quality, and how they relate to the measure of firm effects on which we mostly focus.

Another more technical limitation should be noted as well. As students of statistics are well aware, estimating "fixed effects" from panel data depends primarily on workers who change firms (and,

[3] Though Mincer's (1974) classic work suggests a tradeoff between starting wage levels and wage growth for any given firm, Andersson et al. (2005) find that wage levels and wage growth are actually correlated positively across firms. Hamermesh (1998) also shows that inequality in benefits and other job attributes (like safety) tend to exacerbate inequality based on wages only.

similarly, on firms who change their workers). Within the shorter time periods during which we now estimate the separate fixed effects, fewer such workers will change jobs, and therefore it might be somewhat more difficult to disentangle firm from worker effects within any distribution of overall earnings for workers.

At the same time, there is no reason why these problems should be growing more serious over time, so any trends that we infer from these data should not be considered statistical artifacts. More importantly, we have conducted a number of diagnostic examinations of the person and firm effects we calculated, and how they compare across multiple methods of computing them. We found the estimated firm effects (as well as the person effects) to be quite robust across these various methods. The measures we use are also quite highly correlated with each other across the three shorter periods and with the 12-year measures, and correlate sensibly with other observable characteristics of firms (and in ways that have been noted in previous studies of firm effects).[4] Thus, we are confident that our estimated person and firm effects are both plausible and informative regarding worker and firm quality.

As we note in the appendix to this chapter, we have used a measure of "annualized" earnings for each individual worker in each year when calculating fixed effects and when analyzing worker earnings

[4] We explored a variety of methods for calculating person and firm effects, as described in the appendix. Details are available from the authors. Correlations across the estimates generated by these methods were high – roughly .8-.9 across methods and time periods. Estimated patterns across industry and firm size groups for the different firm effects, as well as patterns across demographic groups for the person effects, were quite consistent across estimation methods and generally are consistent with what we have seen in previous literature. This robustness across methods further strengthens our confidence in the validity of our estimation procedures.

below.[5] This follows a pattern that has been set in virtually all work to date using the LEHD micro data. Many individuals work at multiple jobs and for multiple firms in any given year, but we can only focus on one job when considering any person-year observation. We use the one we call the "primary" employer for any person in any year – in other words, the one for whom the individual has the highest earnings in that year. So as not to understate the earnings of job-switchers who work relatively close to full-time and full-year, we transform each person's quarterly earnings into our best estimate of what they would earn if they worked full-year. On the other hand, this technique might cause us to overstate the annual earnings of those workers who have unstable work histories with frequent periods of nonemployment. Accordingly, our estimates come closer to measuring the determinants of annual full-year earnings potential rather than actual annual earnings.[6]

Finally, for computational reasons (especially related to the enormous sizes of our files) we needed to estimate our person and firm effects separately by state as well as time period. As a result, average (mean) firm effects are, by definition, zero in every state and time period. This means that differences in costs of living across states do not influence earnings outcomes; at the same time, real mean differences in firm and job pay premia across states and over time are not captured by our measures. We recognize that this is

[5] The methods which we use to "annualize" earnings are exactly the ones used in all previous LEHD work by John Abowd, John Haltiwanger, Julia Lane and many others. It is described in the appendix to this chapter as well.

[6] On the other hand, those who work part-time (or fewer hours) per time period will have their lower levels of earnings accurately reflected in the data. Workers who choose part-time work voluntarily – especially married women with small children – cannot be distinguished from those whose choices are constrained by their lower earnings potential in any year. But those who work part-time for just a short period of time will have their higher earnings capacity captured by their person fixed-effects estimates.

a limitation of our work, as it means we primarily focus on trends in *relative* pay premia across firms and jobs, rather than their absolute mean levels.[7]

Still, we can learn a lot about how these premia have changed across jobs and over time. Specifically, we focus on what has happened to the numbers of workers employed and the premia themselves at fixed parts of the premium distribution (e.g., fixed quintiles that are defined in our starting period), and at firms with fixed characteristics (especially industries), to draw inferences about important changes over time. This enables us to infer changes in the variance and the overall shape of the distribution of job quality, and where these changes occur, even if mean levels of such quality are held constant over time by our estimation method.

WORKER AND FIRM EFFECTS: SOME FACTS[8]

[7] Imposing a zero mean on firm effects for each period means we do not allow real wage growth over time to effect job quality measures, thus making it harder to observe job quality growth. But, since we focus on job quality as distinct from worker quality, it is not clear how the mean of an absolute measure of job quality would have trended over time, had we been able to estimate it.

[8] Beginning in this section and continuing throughout the book, we will describe summary measures of earnings outcomes – especially means and medians – and differences in those measures across categories of firms and workers without explicit references to the standard errors on these estimates. Given the enormous sample sizes used here, most computed standard errors on estimated means are very small. But we have considered them when measuring mean differences in our work. It can therefore be assumed that any differences in summary measures of earnings that we highlight below in the text are statistically significant by conventional standards. But any discussions of regression coefficients that appear below in Chapters 3 and 4 do explicitly include t-values based on estimated standard errors.

We begin our analysis with some basic facts about firm and worker effects – including the earnings paid at firms and to workers of varying "quality" (as measured by their estimated person and firm effects), the observed characteristics of workers and firms with different levels of these effects, and of the kinds of workers hired into higher and lower quality firms and jobs.

To do so, we array all of the firms and workers during the first three-year period, 1992-95, according to their firm and person effects, and then divide each into quintiles from highest to lowest. We show the characteristics of firms and of workers from each quintile, and how they "match" to each other. We then use these fixed definitions of quintiles, in terms of fixed effects magnitudes, when measuring changes in the distribution of firm effects (and therefore in job quality) in the subsequent time periods, as we indicate below.

We begin with an illustration of the extent to which individual earnings reflect both worker and job quality, as measured by the person and firm effects we have estimated. Figure 2.1 presents mean average earnings of workers between 1992 and 2003 at each of the five quintiles of the person and firm effects distributions. Firm and worker effects for the three separate subperiods have been averaged together to generate effects quintiles for the entire 12-year period, and (as always) earnings are adjusted for inflation.[9]

The results show that earnings are strongly correlated with both worker and firm effects. Mean earnings are highest in the highest worker effects quintile and decline continuously in all subsequent quintiles; the very high earnings of workers in the top quintile, relative to the others, is consistent with the very high

[9] Since we adjust for inflation over time with the Consumer Price Index for Urban Workers (CPI-U), our adjustments will be mildly overstated, and real wage growth understated as a result. But this bias is constant across all job and worker categories we consider, and thus does not affect our results.

and rising levels of inequality we have observed in the past decade or so, especially for those at the very top of the earnings ladder relative to all others.

But worker earnings are also strongly correlated with our estimated firm effects, measuring the quality of jobs relative to workers who hold them. Indeed, mean worker earnings on an annual basis average nearly $68,000 per year in the top quintile of firms and just over $20,000 in the bottom quintile. At least in our estimates, job quality thus appears to be strongly related to (and perhaps a strong determinant of) worker earnings.

THE NATURE OF GOOD FIRMS AND JOBS

What are the characteristics of firms with varying levels of job quality, as measured by the firm effect? In which industries are they located, and how large are they? Also, how do observed firm effects correlate with other measures of firm and job quality – such as worker turnover rates, which are widely regarded as indicators of job quality for workers, relative to their other labor market prospects?

Table 2.1 shows how employment is distributed across firm effects quintiles, averaged over the entire 12-year period, separately by industry and firm size category.[10] Also, we present mean rates of job "turnover" and "churning" by firm effect quintile in this period, where the former measures the sums of the absolute values of all job changes (both "accessions" to employment within firms and "terminations" out of such employment) relative to base levels of employment; and the latter adjusts for levels of net employment growth at these firms, to generate a clearer measure of movements in and out of jobs unrelated to firm growth and decline.

[10] We have omitted firms with fewer than 25 workers from our analysis, as employment estimates for these small firms tend to be more unstable and more prone to error in measurement.

A number of important findings regarding firm and job quality appear in Table 2.1. For one thing, it is clear that some industries pay much better on average than others, even after adjusting for the quality of workers across industries. Among our more traditional (i.e., non-service) industries, agriculture clearly ranks among the worst in terms of pay, with about two-thirds of employment concentrated in the bottom quintile of firms. In contrast, mining and utilities are highly-paid industries, with half to two-thirds of their workers in top-quintile firms. Construction, wholesale trade and (especially durable) manufacturing are high-wage industries as well, with a third or more workers found in top-quintile firms and 60 percent or more found in the top two quintiles. These are, in fact, the industries where less-educated workers, and especially less-educated men, have traditionally earned relatively high wages. In contrast, retail trade pays low wages, with about 60 percent of jobs in the bottom two quintiles.

All of these findings are consistent with other studies in the past (e.g., Krueger and Summers, Dickens and Katz) that have found strong differences in pay rates by industry for workers with the same observable skills. And, even within each of these industries, a range of job qualities can be found. For instance, about 40 percent of all jobs in retail trade are found in the top three quintiles. These jobs are likely to be found in supermarkets, department stores and other larger establishments, as well as those in specialty stores perhaps requiring more specific information or skills on the part of employees.

But, while job quality in these broad sectors largely confirm to past impressions, what job qualities do we find in the service sector? While many analysts consider this sector to be a lowly-paid one as well, the results indicate a much wider range of job qualities than that stereotype suggests. For instance, "accommodations and food" (i.e., motels, hotels and restaurants) is a very low-paying industry, as are, to lesser extents, "entertainment" and "administrative services"; in each case, around 40 percent or more of jobs are located in the bottom quintile of firm effects, and thus the low wages paid there cannot be accounted for fully by low worker skills.

On the other hand, the professional and information services are high-paying, with over half of all jobs in each located in the top quintile of firm effects. "Management of companies and enterprises," a relatively small sector comprising those firms that own or administer other firms, also pays quite well, with about three-fourths of all jobs found in the top two quintiles of firm effects, and financial services similarly have about two-thirds of their jobs in the top two quintiles. No doubt, the education and skills of workers in these sectors are quite high as well, but these jobs pay well even to workers who have not been well-paid in other jobs in their careers. Interestingly, real estate jobs are spread almost evenly across the five quintiles, while jobs in health care (about 63 percent) and public administration (about 66 percent) are heavily concentrated in the second and third quintiles of firm effects.

Besides industry, what other characteristics of firms are associated with higher or lower pay, adjusting for skill differences? All else equal, jobs at large firms have tended to pay more than those at small firms, though the exact reasons for the "firm size-pay premium" have stayed elusive to researchers (Brown et al., 1990). Our data show very clearly that this continues to be true today. While firms that range in size from 25 to 10,000 have roughly equal chances of being in the top pay quintile, those that are especially large (in other words, those with over 10,000 employees) are more likely than others to be found in that top quintile. And for those in the size categories below the top one, we clearly see higher concentrations in the second and third quintiles for those with 100 or more employees, and in the bottom quintile for those with 100 or fewer.

Clearly, firm size continues to matter for levels of pay (and presumably benefits), with larger firms still paying significantly more than smaller ones. Past research suggest a number of factors that might account for this – including greater capital intensity, higher rates of unionization, higher profits and "ability to pay," as well as more professional human resource management activities.

Finally, the measures of turnover and churning that we have calculated are quite strongly related to the firm earnings premium. Turnover rises modestly between the first and third firm effects quintile and more substantially as we move to the bottom two quintiles. Churning, which adjusts for firm growth levels over time, shows a similar pattern, but rises even more clearly over the entire range of firm effects quintiles as we move from the highest- to lowest-paying firms and jobs.

The fact that job turnover is lower at firms that pay more is perhaps not very surprising. Workers are less likely to quit these jobs, and are also motivated to work more productively to avoid being discharged. To the extent that high-paying firms also might have steeper profiles that associate pay with on-the-job training and worker experience, workers might also be motivated to protect their investments in skill acquisition and seniority at these firms.[11]

In sum, it is clear that there are distinct patterns of pay by industry and firm size categories, and that our measures of job quality across firms correlate highly with other measures of worker satisfaction at their jobs, such as turnover out of employment.

THE NATURE OF GOOD (OR HIGHLY-PAID) WORKERS

How do the pay premia earned by workers themselves vary, and to what extent do these premia indicate higher levels of skills and earnings capacity? Are workers with particular demographics – such as age, race, gender, and foreign- v. native-born status – more or less likely to be permanently higher earners? And how well does educational attainment (as measured in the 2000 Census of Population for a subsample of our workers) correlate with our worker fixed effects?

[11] The notion that on-the-job training and earnings growth over time should discourage job turnover has been emphasized by Jovanovic (1979) and Lazear (1979), among others.

Table 2.2 presents the distribution of workers across the five quintiles of worker fixed effects, separately by age group, race, gender, foreign- v. native-born status, and educational attainment. The table is thus comparable to much of Table 2.1, except that it focuses on worker characteristics and effects rather than those of firms.

We find that, consistent with a lengthy literature in economics on the nature and determinants of differences in pay, the earnings premia of workers do differ quite a bit across demographic groups. For instance, workers in their middle years (i.e., ages 35-64) are more likely to have higher fixed effects than those who are younger (ages 18-34); whites and especially Asians have higher fixed effects than blacks, Native Americans and especially Hispanics; men are more likely than women to be in the highest-paying quintiles; and the foreign-born are less likely to be found in the top quintile and more likely to be found in the bottom one.

All of this is, of course, consistent with other findings on pay (Ehrenberg and Smith, 2009) and even on person effects (Andersson et al., 2005). What is less clear is the extent to which differences across these demographic groups reflect real differences in skill and productivity, as opposed to discrimination and other sources of pay difference (such as quality of networks and information). Recent evidence on pay disparities by gender and race suggest that the role of discrimination has declined somewhat over time, and that the disparities that remain are more reflective of gaps in school "achievement" and/or language (for differences by race/ethnicity and foreign-born status) as well as those in work experience (for differences by gender).[12] On the other hand, evidence from experiments and other data suggest that

[12] Neal and Johnson (1996) show that racial gaps in earnings are greatly reduced, though not fully eliminated, when one controls for cognitive achievement as measured by test scores. Waldfogel (1998) shows that the male-female wage gap has mostly disappeared for young women and men, but remains for older cohorts and appears related to

discrimination has not disappeared; and the skill development and job choices of workers might interact with other forms of stigma and perceived expectations by employers and supervisors.[13] Ongoing pay disparities across these demographic groups likely reflect a range of factors reflecting differences in opportunities to develop skills and how such skills are rewarded in the market.

Finally, we see clear differences in worker effects by educational attainment categories. Those without high school diplomas rarely end up with high person effects and are mostly concentrated in the bottom two quintiles of person effects. High school graduates are spread more evenly across these categories, and those with some college (but less than an associate's degree) are only a bit more concentrated in the higher quintiles. But those with associates' and especially bachelors' degrees are substantially more likely to have high earnings premia, while those with professional and doctoral degrees are most likely of all to have high person effects.

On average, then, educational attainment affects earnings capacity substantially. Still, we do find important variation in permanent earnings capacity within each level of education. For instance, about 20 percent of those with professional or doctoral degrees still have earnings premia in the bottom two quintiles, as do about 30 percent of those with bachelors' degrees. Over a third of high school graduates end up in the top two quintiles of pay premia, as do over a fifth of high school dropouts. Thus, while the

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maternity. Borjas and Katz (2005) and Trejo (1997) show that immigrant-native earnings disparities, especially for Mexican-Americans, mostly reflect differences in educational attainment and language ability.

[13] Glenn Loury (2003) has argued that racial stigmas affect incentives among minorities to invest in human capital. Niederle and Vesterlund (2007) show experimental evidence that women tend to shy away from competitive situations, relative to men. The persistence of discrimination in hiring has been demonstrated in a series of audit studies comparing matched pairs of whites and blacks (Darity and Mason, 1998; Pager, 2003), though Heckman (1998) has cautioned against inferring too much about market-wide discrimination from these studies.

level of educational attainment is certainly important – and has become more so over time – it is far from a perfect predictor of one's long-term pay prospects. Variation in educational quality as well as in cognitive, analytical and communication skills account for large parts of the observed spread in pay, as do employment sectors and specific skills and experience developed in those sectors as well.[14] Because of the relatively limited value of educational attainment alone as a measure of personal labor market skill, we mostly focus on the person fixed effects as measures of such skill throughout the book.

THE MATCHING OF WORKERS TO JOBS

If workers from different demographic and educational groups are unevenly distributed across worker effects categories, how are they distributed across firm effects categories? In other words, what personal characteristics of workers are associated with the ability to get good jobs? And to what extent does this ability merely reflect their own personal skills, as opposed to other factors – like discrimination, informal networks, geographic location of residences v. businesses, etc. – that also determine such "access"?

Our earlier work (Andersson et al., 2005) addresses these questions in detail, but a bit of information appears in Table 2.3. This table is structured just like Table 2.2, except now we consider how workers in each category are distributed across firm effects quintiles rather than worker effects quintiles. Of course, the person effects of individuals in these groups will certainly influence their placement into jobs with various firm effects. So, at the top of the table, we present the distribution of workers across firm effects quintiles according to the worker effects quintiles in which they appear. This gives us some sense of the extent to which skills and earnings capacities of workers drive their distributions across job quality categories. And the distributions of workers by age, race, gender, foreign-born status and education across

[14] For recent evidence on how the labor market increasingly rewards cognitive and interactive skills see Levy and Murnane (2004) and Autor and Dorn (2009). The fact that similar skills are rewarded differently in different firms and sectors of the economy has recently been emphasized by Lazear (2009).

jobs can be compared with their distributions across earning capacity groups in the earlier table, so that we can infer how much their access to jobs exists independently of their longer-term skills.

Overall, Table 2.3 certainly shows that personal skills and earnings capacity are strongly related to who becomes employed in "good jobs." The top panel of the table shows a strong concentration of workers on the "diagonal" elements of the matrix created by worker and firm effects quintiles – in other words, *workers are more likely to be in jobs with roughly similar fixed effects than in jobs with quite different effects*. If correct, this implies that, on average, good workers tend to get good jobs.

On the other hand, the numbers of workers found in off-diagonal positions in the matrix are also quite substantial. For instance, since 60-70 percent of workers in the top or bottom quintiles of person effects end up in the top or bottom firm effects quintiles – implying that 30-40 percent are in lower or higher job quintiles than their person effects alone would predict. For those in the second through fourth person quintiles, only 30-40 percent are on diagonals – implying much larger shares of people in either better or worse jobs than their person effects alone would predict.[15]

Of course, the strong correlations between person and firm effects might be at least partly statistical artifacts, if our data were not strong enough to allow us to fully disentangle these two components of individual's earnings. In particular, if the 4-year time periods in which we estimate these effects are too short, and not enough individuals change jobs within those time periods, effects associated with people might be incorrectly attributed to their jobs or vice versa – leading to more diagonal elements than might really be the case.

[15] The greater concentration of workers at the top and bottom diagonal elements, relative to those in the middle, occurs at least partly because there are no more adjacent categories above and below the former elements respectively.

On the other hand, there is no obvious reason why this should be more (or less) true in some periods than others – so if the matrices change over time, this might well indicate systematic changes in how workers of varying skill sets are allocated to jobs over time - an issue which we explore below. Furthermore, we appear to have sufficient numbers of workers in off-diagonal elements of this matrix to be able to explore the relationship between worker skills and job quality, at least to some extent, as we do below.

What other characteristics of workers are associated with the tendency to be employed in good (i.e., high firm effects) jobs? The rest of Table 2.3 shows how individuals in different age, race, gender, foreign-born and education groups are allocated into jobs of different quality. The results largely parallel those of the previous table – which showed how workers in these groups are allocated across personal skill (person effects) categories. In other words, those workers who are younger or older, black or Hispanic, female, foreign-born or with a high school diploma or less are less likely to have "good jobs" than are those who are middle-age, white or Asian, male, native-born or have college or graduate degrees. The magnitudes of the differences across these categories for jobs are consistently smaller than for worker skills – implying perhaps that relationships between skills and jobs account for some differences of these groups, but that beyond skills there are variations in job quality across these groups as well.

A more straightforward way of estimating these differences is to compute the relationship between job quality of workers, on the one hand, and their skills and demographics, on the other, through multiple regression. We have therefore estimated a regression of the workers' firm effects on their personal effects as well as age, gender, race and foreign-born status. The results show strong relationships between person and firm effects, as expected; but also that some significant race and gender differences in job quality persist as well. For example, women, Hispanics, and foreign-born workers have more difficulty being employed at high-paying firms, even controlling for their person effects. The magnitudes of these effects are not enormous; if anything, these estimates likely understate the effects of personal demographics,

since personal effects might capture these to some extent as well.[16] Nevertheless, *access to good jobs seems determined not only by personal skills but at least partly by other factors*, including discrimination, quality of networks, and geographic "mismatches" that can influence such access.[17]

Overall, these data indicate that the quality of jobs varies importantly by characteristics of the firm as well as those of workers. But important questions remain about how the availability, characteristics and accessibility of these jobs for different groups of workers might have changed over time. We turn to these issues below.

JOB QUALITY AND WORKER ACCESS: TRENDS OVER TIME

If we define job quality by the fixed effects that firms pay to workers, adjusting for what they earn on the basis of their own skills, how has job quality (at least in a relative sense) trended over time?[18] The answer to this question appears in Figure 2.2, where we plot employment growth during the period 1992-2003 for each quintile of the firm fixed effects distribution. The data use fixed quintiles, as defined by the

[16] Details are available from the authors. The estimated negative effects of being female, minority, or foreign born, controlling for person effects, were just 1 percentage point or so in each case, while the coefficient on the person effects coefficient was roughly .3. Surprisingly, the estimated effects of being black were small but positive, likely reflecting the greater tendency of blacks to be employed at large firms (Holzer, 1998) and of so many unskilled blacks to be absent from the workforce altogether.

[17] See Holzer (1996) for a broader discussion of how access to different kinds of firms and jobs varies by race/ethnicity and gender. Andersson et al. (2005) also present evidence that high-wage jobs are concentrated geographically near higher-income residential areas, further limiting access for lower-income and minority groups.

[18] As noted above, changes in measured job quality are primarily relative in nature, since the means of firm fixed effects are set at zero in each period by our estimation procedure.

distribution of effects in 1992. For each quintile, the bar charts present employment growth for each year during the period between 1993 and 2003, relative to the base year of 1992. The data make use of all firms' employment changes over the entire period – even for newly-born firms and those shutting down - as well as any changes that occur in ongoing firms' fixed effects over time.

Overall, Figure 2.2 shows that the "good jobs" are not disappearing. If anything, *jobs in the highest quintile grew more rapidly than did those at any other point of the firm effects distribution*. But jobs near the bottom in terms of quality – in other words, those in the fourth quintile - also grew faster than others. And those in the second quintile – which are good jobs but not the best - grew more slowly than others.

The effects of the business cycle are also apparent in Figure 2.2, when comparing jobs in 1999-2000 (the fifth and fourth bars from the right) to those of 2002-03 (the last two). In each quintile, overall employment peaked in 1999 (or in 2000 in the top quintile) and then hit its trough in 2002, which actually reflects the job market effects of the recession that began in 2001.[19] The cyclical decline in employment during this recession is actually strongest in the top quintile, and did not recover as much in 2003 as did employment in lower quintiles. Still, the cycle did not change the fact that employment in the highest and next-to-lowest quintiles grew most rapidly during this entire time period, while in the next-to-highest group it grew most slowly.

This pattern is somewhat consistent with the notion of growing "polarization" in the labor market – though that terminology is usually applied to workers and their earnings rather than jobs.[20] The impacts of

[19] The trough of that recession occurred in 2002, when measured by payroll employment, and 2003 when measured by unemployment rates. The latter often continue to rise, even after employment levels at firms have bottomed out, until employment growth is strong enough to absorb new labor force entrants.

[20] See Autor et al., 2006.

these job changes on worker earnings depend not only on which jobs grew more or less, but also on how job availability impacted workers of different skill levels, which we consider below. Also, the magnitudes of these changes are not quite as large as they seem. Given that each quintile has roughly 6.3 million jobs in 1992, growth rates ranged in magnitude from about 25 percent for the top quintile to just 8 percent in the second quintile for the year 2000; and from 19 percent to 8 percent for the same two quintiles up through 2003. Still, overall employment did not shift dramatically across quintiles over this time period, with employment in the top quintile rising to 21.8 percent of the total in 2000 and 20.5 percent in 2003, while that in the second quintile declined to 18.6 and 18.5 percent respectively in those years.

But, as employment shifted away somewhat from the second quintile towards those in the first and fourth, exactly which jobs were changing in availability, in terms of industry? Did the composition of jobs change within each quintile? And how did these changes translate into the availability of good jobs for different categories of worker by their skill levels?

INDUSTRY EFFECTS

In Table 2.4 we begin to analyze these industry effects. The table shows how jobs in each quintile of the firm effects distribution were distributed across industries in 1992 and then in 2003. In the subsequent tables we then consider who got these jobs, and how the ability of less-skilled workers to get "good jobs" might have changed in this 12-year period.

A number of findings appear in Table 2.4. What is most notable is that jobs in durable and nondurable manufacturing declined in each quintile of job quality, but the declines are steepest within the highest quality quintiles. In particular, jobs in durable manufacturing constituted nearly a fourth of all jobs in the top quintile in 1992, but only about 15 percent in 2003. Durable and nondurable manufacturing jobs together accounted for about 37 percent of employment in the top quintile in 1992 and only 24 percent in 2003; in other words, the share of the best jobs accounted for by manufacturing declined by over a third in

just over a decade. Comparable shares for jobs in the second quintile were 26 percent in 1992 and 19 percent in 2003, indicating a decline in the manufacturing share of over a fourth, and with nondurable jobs declining by even more than those in durable manufacturing among these.

Where did these "good jobs" go – in other words, which sectors grew the most as a share of jobs in the top quintiles, relative to other quintiles? While the shares of employment in the top quintile rose a bit in construction, wholesale and retail trade, they grew the most in a variety of service jobs – especially in professional services and finance, as well as health care, administrative services and public administration. In the second quintile, they grew most in administrative services, public administration and retail trade as well as in health care, construction and information services. Even within the third quintile, a shift out of manufacturing and towards retail trade, administrative services, and health care is noteworthy.

Thus, the jobs in the top quintiles seem to be shifting away from a sector where less-educated workers have historically gotten high-paying jobs, towards those in the service sector (like professional services, health care and finance) where educational credentials might be stronger determinants of who gets employed and at which firms. So Table 2.5 considers the distribution of workers, separately for each person effects quintile, across these same industries.

What we find is that employment of the highest skill workers declined only modestly in manufacturing (both durable and nondurable), and rose in professional services and information. But the declines in manufacturing employment in the other quintiles are larger; indeed, manufacturing jobs fell from about 24 percent to 18 percent of all jobs among second quintile workers; and from 19 to 15 percent among those in the third quintile. In these two quintiles, health care and public administration mostly made up for the decline in the manufacturing share. But that share fell from 18 to 8 percent among those in the fourth quintile, and 10 to 4 percent among those in the bottom quintile. Thus, *in the top three quintiles of worker*

skills, the shares accounted for by manufacturing declined by a fourth or less; in the bottom two quintiles, they declined by well over half. Instead, employment in retail trade rises most noticeably for workers in the bottom quintile of skills.

Overall, these results suggest that the ability of less-skilled workers to get jobs in the highest-paying firms declined, as the best-paying jobs in manufacturing were replaced by those in professional and information services and the presence of the least-skilled workers declined in the manufacturing jobs that remained. Yet the growth of jobs in construction, health care, public administration and elsewhere – and the growing shares of these jobs going to workers in the lowest skill groups - suggest at least some possibilities for less-educated workers to still get "good jobs."

One way to measure the availability of relatively good jobs for workers at different points in the distribution of skills is to focus on all those whose job quality is greater than what might be predicted on the basis of person quality and skills alone – in other words, those whose firm effects quintiles are greater than their firm's person effects quintiles. In Table 2.6 we measure the distribution of all such workers across industries, separately by the person quintile of the firms in which they appear as well as overall.[21]

The results of Table 2.6 show that, for workers overall, *the extent to which manufacturing provides good jobs to workers has fallen by hal*f – from about 27 percent of all such cases in 1992 to 13.5 percent in 2003. While a number of industries – such as construction, wholesale trade, and professional services have modestly expanded the share of such jobs that they provide (with a rise of about a percentage point in each case), the share accounted for by retail trade rises the most – from 9 to nearly 17 percent. This industry – perhaps through its department stores and specialty shops – now provide good jobs to many workers in the fourth and fifth quintiles of skills who obtain jobs in higher quintiles of firm quality.

[21] By definition, no such category exists for those in the top quintile of person effects.

Within other specific quintiles of workers, we find health care, construction and public administration providing increasing shares of better jobs to workers at firms in the second and third quintiles of skill.

On the other hand, the skills workers need to obtain such jobs are likely greater than was true for the manufacturing jobs of the past. The jobs in construction and health care that pay above-average wages tend to be those in the "middle-skill" categories described in Chapter 1 – in other words, those that require some type of training or certification beyond high school. In health care, these often include nursing certificates or degrees, technicians and therapy assistants. In construction, these include the skilled crafts such as plumbing, electricians, and the like. Even in manufacturing, the remaining jobs often require sophisticated numeric and computing skills in jobs like machinists, or other specific skills (such as welding). And, even in retail trade, a range of communication and arithmetic skills appear necessary for the better-paying jobs.[22] The shift of better-paying jobs from manufacturing to other sectors thus implies a higher set of skill needs to obtain better-paying jobs, even for those without college diplomas.

Before moving onto a more general consideration of how workers of different skill groups are matched to jobs of varying quality, we present a few more results by industry. For instance, are the pay premia by industry themselves changing over time, as industries restructure and shift employment towards higher- or lower-skill employees?

Table 2.7 compares the firm fixed effects paid in these industries in 1992 and 2003, as well as the person effects of workers hired in each year. The table shows that the pay premia by industry remain surprisingly constant over this 12-year period. While information and professional services jobs appear to be compensated somewhat better in the later years than earlier, while those in mining and utilities pay a little worse, the changes in most other sectors are very modest. The pay premia in retail trade becomes just a

[22] See, for instance, Holzer (1996), Handel (2006), and Holzer and Lerman (2007).

bit less negative over time, confirming our impression from above that the share of good jobs now appearing in this industry is rising; and the estimated firm effects in health care continue to average very close to zero, suggesting that this industry continues to provide a mix of high-paying and low-paying jobs.

As for worker skills, these results confirm what we saw in Table 2.5 – namely, that the skills of those being hired rise very clearly in construction and manufacturing, as well as in information services. This implies that, at least in two of the highest-paying industries that hire many less-skilled workers, it is now harder for the least-skilled workers to get jobs than before.

Overall, the results by industry tell a quite consistent story. Lots of high-wage jobs are still available and are being newly created in American labor markets. But they are less likely to be found in manufacturing and more likely to be found in a variety of service industries than before. Indeed, the magnitudes of the shifts in employment of good jobs across industries within roughly a decade are quite striking. And, within manufacturing and elsewhere, the jobs that remain are becoming less accessible to workers whose own personal skills are weak.

FIRM AND WORKER EFFECTS: WHO IS GETTING THE GOOD JOBS?

If the erosion of manufacturing employment and the relative growth of service industries have made good jobs less accessible to somewhat less-skilled workers, this should also be evident in data on which kinds of workers are getting which kinds of jobs, regardless of the industries in which they appear.

Table 2.8 presents data on this fundamental question. For workers in each of the five quintiles of person effects in 1992 and again in 2003, it shows the extent to which they are employed by firms in the various quintiles of the firm effects distribution. In other words, Table 2.8 shows us the extent to which "good

workers" are matched to "good jobs" at the beginning and end of our period, and thus whether the tendency for these two to be matched is growing over time.

A number of striking findings appear in the table. As we noted earlier, over 60 percent of the very best workers (i.e., the top quintile of person effects) are employed at the very best-paying firms (the top quintile of firm effects), which is now evident both in 1992 and 2003. The same is true for the "worst" workers (at least as measured by their person effects) who end up in the worst job quintile. Yet the other quintiles of workers show more tendency to be employed either at better or worse jobs than their own person effect would predict – with about 30-40 percent in each employed in a comparable job quintile, and all the rest being employed at jobs in higher or lower pay quintiles.

In terms of changes over time, we find an increasing tendency of the very best workers to be concentrated in the very best firms (with the fraction rising from about 64 to 67 percent) and for the "nearly best" workers (i.e., those in the second quintile) to end up in the "nearly best" jobs (with that concentration rising from 34 to 39 percent). Among less-skilled workers, the largest changes are apparent for those in the fourth quintile of person effects – in other words, those with relatively weak personal earnings capacity though not the lowest. For this group, we see a distinct dropping off in the percent of workers employed in the second and third quintiles of job quality (from about 13 to 7 percent and 26 to 24 percent respectively), while their concentration in the bottom two quintiles of firms rises.

A closer look at how workers of different skill levels are being increasingly linked to jobs of similar qualities over time appears in Figures 2.31-2.35. Separately for workers in each of the five quintiles of person effects (or skills) in each table, we present the annual shares of their employment in each of the five quintiles of firm effects. With the shares presented for each year in each case, we can see the extent to which there is really a consistent secular trend towards greater matching of high-skill workers to high-paying jobs and of low-skill workers to low-paying jobs.

The data basically tell the same story as Table 2.8. The very best workers – i.e., those in the top quintiles of person effects – are consistently being more frequently matched to the very best jobs. The relatively high-quality workers of the second quintile are similarly being increasingly matched to quite highly-paying jobs (in other words, the second quintile of firm effects) over the 12-year period, and away from those in the bottom two quintiles. And workers in the fourth quintile – whose person effects are relatively weak but not among the very worst – clearly have more difficulty ending up in relatively good jobs (in the second or third quintiles) and more frequently end up at or near at the bottom of the pay scale. With the most skilled workers increasingly obtaining the best jobs, and with fewer of these good jobs going to the less-skilled, it is little surprise that earnings inequality would be rising substantially with time.

But inequality depends not only on the distribution of more- and less-skilled workers between firms and jobs of different quality, but also on any changes occurring in relative rewards to these groups within firms. So, given that workers end up within firms that pay relatively well or poorly, how have the fortunes of the most and least skilled workers evolved over time? Figure 2.4 presents the average ratio of earnings for workers in the 90^{th} and 10^{th} percentile within firms in each of the firm effects quintiles. The chart thus measures the trends in inequality between skill groups of workers but within firms of varying quality, as distinct from whether or not different kinds of workers get hired at all at these firms.

The result show a rising ratio of pay among the highest to lowest paying workers in each quintile of job quality, as we might expect during an era of rising inequality. But these increases are most pronounced in the top two quintiles of firm and job quality. The rise of pay inequality within the best-paying firm at fixed parts of the pay ladders may at least partly reflect the rising concentration of highly-skilled workers there, with the average quality of those at the 90^{th} percentile rising relative to those at the 10^{th}. But they also reflect a greater tendency for the most skilled workers to be relatively better-compensated than the

least-skilled within firms and over time, even at fixed positions on the relative pay scale and for workers with given relative levels of ability.[23]

Either way, the results overall suggest that good jobs are increasingly becoming the province of good workers – as defined by their permanent earnings capacities. Such good jobs are increasingly out of reach for those with weak or poor skills, and their pay is relatively weakened even when they manage to be hired at these good-paying firms.

CONCLUSION

What kinds of jobs might be considered "good jobs" in the United States today, and who gets those jobs? Importantly, are "good jobs" disappearing in the United States? Our analysis of job quality and worker quality over a recent 12-year period such that the answer to this last question is not a simple "yes" or "no."

To address these questions, we analyze an enormous body of longitudinal data on both workers and firms assembled by the U.S. Census Bureau. We develop measures of the quality of workers and jobs based on worker and firm "fixed effects," which capture the earnings premia that workers receive and firms pay over a period of years. We allow these effects to vary over time, to allow for the possibility that firms might adjust their pay practices in response to changing economic circumstances and opportunities, and that workers can also adjust the levels of skill they acquire. Indeed, the three time periods during which we estimate these effects – 1992-95, 1996-99, and 2000-03 – reflect distinct periods of recovery, boom and downturn in the US economy that merit separate consideration. Though we do not have data reflecting the mild recovery in the labor market after 2003 and the Great Recession that came afterwards,

[23] In other words, pay gaps widen over time within firms between those at fixed percentiles of the person fixed effects distribution.

we believe our findings likely reflect long-term secular trends in the job market that remain relevant despite these major cyclical swings.

Like other analyses that have relied on similar measures in the past, we find the firm effects strongly related to other characteristics like industry, firm size, and job turnover or churning. Worker effects are closely related to other characteristics such as race and gender, foreign-born status, and education. Indeed, our measures indicate that educational attainment is an important determinant of worker earnings capacity, but that such capacity also varies greatly for those at any given level of attainment. No doubt, this variation reflects the many dimensions of productivity and skill which years of education alone do not capture, as well as the systematic advantages and disadvantage that are still associated with race/ethnicity and gender in America. But, overall, our results also confirm that our worker and firm effects measures are reasonably estimated and generally trustworthy.

What do our measures show regarding changes over time? At least in a relative sense, we can say that *good jobs are not disappearing in America*. We find that the jobs in the top quintile of quality grew most rapidly in the period 1992-2003, though those in the second and third quintiles grew more slowly. The results are broadly consistent with the notion of some "hollowing of the middle" of the job market that some recent analyses have stressed in their work. But, even though the differences in growth rates across these job quality categories seem substantial, the magnitudes of these changes are not large enough to dramatically change overall job availability at different levels of pay.

Perhaps more important, however, are *changes in the ability of less-educated workers to be employed in these good-paying jobs*. Across industries, we find a dramatic shrinkage in the extent to which manufacturing – especially durable manufacturing – accounts for jobs in the top two quintiles. At the very top, these jobs are being replaced by those in professional services, information, and other sectors where

good pay generally requires strong postsecondary credentials. And, where jobs remain in manufacturing, they were increasingly being filled by workers from the top of the skills distribution.

For less-educated workers who are largely concentrated in the lower-to-middle categories of skill as measured by "person effects," they increasingly find "good jobs" (as defined by fixed effects that are larger than their own person effects) in health care or retail trade rather than the more traditional sources of these jobs in manufacturing, mining and utilities. Construction continued to be a source of good jobs during this time period for these workers, though the bursting of the housing "bubble" since then raises some questions about its ability to provide them in the future. And, even in these sectors, good-paying jobs require either postsecondary training and credentials (in health care and construction) or social/verbal and arithmetic skills (in retail trade) that go beyond what was needed for the good jobs of the past.

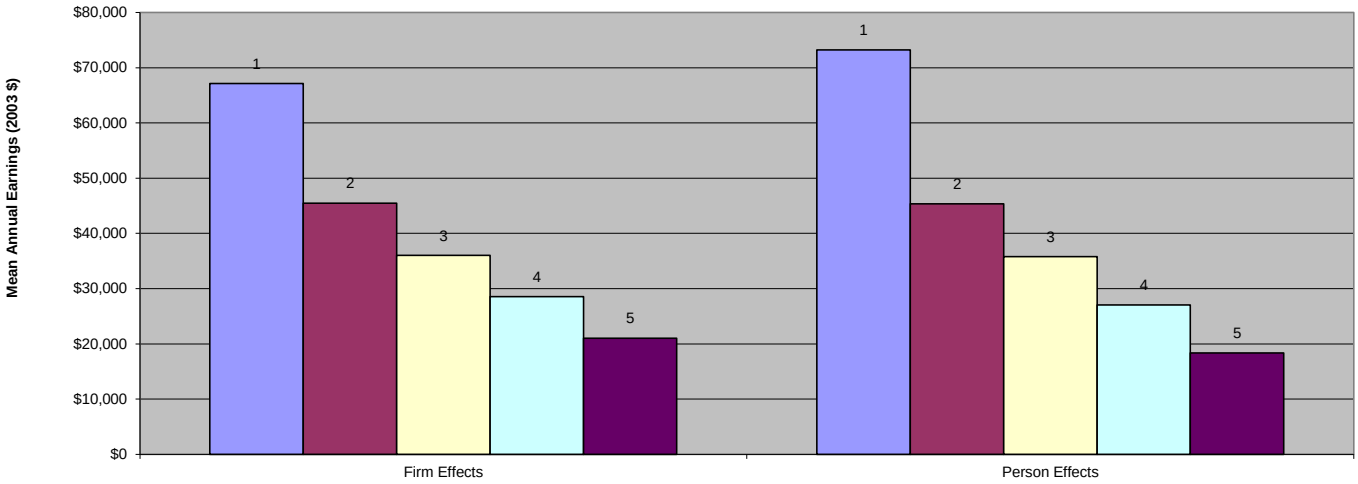
More broadly, we find a trend in which the quality of jobs obtained by workers are more closely aligned with their own personal skills – so that our measures of worker and job quality are lining up more closely with one another than in the past. And, within the best-paying firms, the ratio of pay between the highest- and least-skilled employees are growing more than elsewhere – suggesting that, even within the good-paying jobs and firms, rewards are growing most rapidly for those with the best skills. All of this contributes to growing inequality across workers over time.

What all this implies for policy is that the traditional bifurcation of discussions on labor market performance between advocates of "good workers" (i.e., education and skills) and "good jobs" (i.e., those that pay well even for unskilled workers) is gradually becoming obsolete. Of course, there remains a wide range of job qualities for workers of any skill level. Some industries still pay much better than others; large firms still offer better opportunities than small ones. And, within industries and areas, firms still choose widely-varying human resource practices that constitute a "higher road" in some cases and a

"lower road" in others, with important consequences for the employment outcomes of the workers who end up in each type of firm.

Still, the "good jobs" of today and tomorrow increasingly require good skills among the workers who get them. Therefore, the best strategies going forward should perhaps emphasize the creation of "better workers for better jobs," rather than a set of choices in which we need to choose between these. Education and workforce policies that better target high-paying jobs, such as the best career and technical education programs (including apprenticeships) and "sectoral" training policies, could be particularly useful in this light. Community colleges could be encouraged to be more responsive to local labor demand, especially high-demand and high-wage sectors of the economy. And efforts to incent or assist employers in the creation of more good-paying/high-productivity jobs, such as the Manufacturing Extension Partnership, might be useful as well in this regard. (All of these policy options are discussed at length in Chapter 6 of our book.)

Figure 2.1
Mean Annual Earnings by Firm or Person Effects Quintile, 1992-2003



(Quintile 1=highest)

Table 2.1

Distribution of Employment (Percentages) and Turnover across Firm Effects Quintiles, 1992-2003

	Firm Effects Quintile (1=Highest)				
	1	**2**	**3**	**4**	**5**
Industry					
Agriculture	2.4	6.5	10.2	14.5	66.4
Mining	54.3	20.4	11.7	9.6	3.9
Utilities	65.4	25.9	5.3	2.2	1.2
Construction	33.7	26.9	18.0	13.5	8.0
Non-Durable Manufacturing	28.4	28.7	19.2	12.8	10.9
Durable Manufacturing	43.6	24.5	15.5	10.9	5.4
Wholesale Trade	34.6	25.3	20.1	11.9	8.2
Retail Trade	8.9	8.8	22.8	37.2	22.3
Transportation	14.5	26.3	24.0	20.1	15.0
Services					
Information	52.6	16.8	10.8	10.5	9.3
Finance	29.1	37.2	20.8	10.9	2.0
Real Estate	20.6	16.6	20.5	19.3	22.9
Professional	57.5	16.0	8.6	6.6	11.3
Management	43.1	32.1	11.9	7.9	5.1
Administrative	10.6	8.8	14.2	27.3	39.0
Education	0.8	5.9	27.5	42.2	23.6
Health Care	7.6	29.1	33.9	16.2	13.1
Entertainment	7.0	10.5	13.1	27.3	42.0
Accommodation & Food	2.7	4.1	9.8	28.1	55.3
Other Services	16.8	14.5	15.7	20.8	32.2
Public Administration	16.6	38.1	27.7	10.9	6.7
Firm Size (# Employees)					
25-49	19.2	13.3	16.2	18.8	32.4
50-99	21.3	14.5	16.8	19.1	28.3
100-999	20.9	19.2	20.0	19.7	20.2
1,000-9,999	20.6	24.8	22.0	20.7	11.9
>=10,000	24.6	18.7	23.3	28.0	5.4

Average Annual Turnover and Churning by Firm Effects Quintile, 1992-2003

	1	**2**	**3**	**4**	**5**
Turnover	22.3	21.5	23.9	29.4	36.6
Churning	13.8	14.8	17.7	22.8	28.2

Note: For employment distribution, rows sum to 100%. Annual turnover of a firm is defined as the number of job accessions and job separations between two consecutive years divided by the total firm employment in those two years. Annual churning is defined as the number of job accessions and job separations minus the absolute change in firm employment divided by the total firm employment. Turnover and churning are calculated for jobs with full-quarter employment only.

Table 2.2
Distribution of Employment (Percentages) across Person Effects Quintiles, 1992-2003

	Person Effects Quintile (1=Highest)				
	1	**2**	**3**	**4**	**5**
Age					
18-35	19.0	18.4	20.4	20.9	21.3
35-45	22.5	21.2	21.7	19.0	15.6
45-64	20.8	20.8	21.8	19.5	17.2
Race					
White	22.0	20.7	21.6	19.6	16.2
Black	15.8	18.4	20.6	21.6	23.6
Hispanic	8.5	13.7	19.8	24.6	33.5
Asian/Pacific Islander	26.4	19.5	18.7	18.3	17.1
Native American	11.2	15.1	23.0	25.9	24.8
Gender					
Female	14.9	16.6	21.7	23.7	23.1
Male	24.9	22.1	20.2	17.0	15.8
Foreign-Born					
No	20.5	20.0	21.3	20.0	18.3
Yes	17.6	16.2	18.8	21.7	25.7
Educational Attainment					
Less Than High School	7.8	14.4	20.7	24.4	32.7
High School	15.6	20.5	22.6	20.7	20.7
Some College	19.8	20.1	21.5	20.0	18.6
Associate Degree	22.0	22.0	23.8	18.4	13.7
Bachelor's Degree	32.1	19.3	19.5	18.2	10.9
Master's Degree	30.7	15.2	21.3	23.5	9.3
Professional Degree	33.4	24.8	20.9	13.2	7.7
Doctoral Degree	33.1	25.0	23.8	12.5	5.5

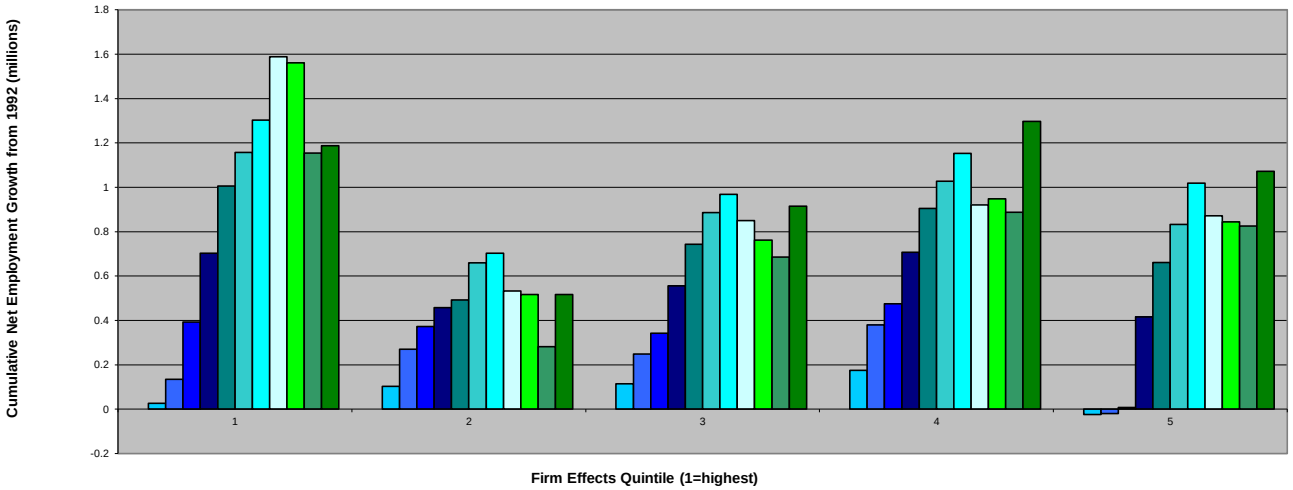
Note: Rows sum to 100%. Data on education comes from the long-form of the 2000 Decennial Census, which includes approximately one-sixth of the workers in our data. Education results are calculated solely for these workers and solely for the year 2000.

Table 2.3
Distribution of Employment (Percentages) across Firm Effects Quintiles, 1992-2003

	Firm Effects Quintile (1=Highest)				
	1	**2**	**3**	**4**	**5**
Person Effects Quintile					
1	66.8	24.2	7.0	1.7	0.4
2	24.9	37.4	24.7	10.5	2.4
3	9.2	24.7	34.5	23.2	8.5
4	3.2	9.0	24.4	40.1	23.2
5	1.0	2.1	8.7	27.0	61.2
Age					
18-35	20.4	18.7	19.7	21.1	20.1
35-45	22.7	21.2	20.6	19.3	16.1
45-64	20.7	20.2	20.5	20.5	18.0
Race					
White	22.0	20.1	20.5	20.4	17.0
Black	18.0	20.0	20.2	20.6	21.2
Hispanic	14.6	16.1	19.0	23.3	27.0
Asian/Pacific Islander	27.7	20.1	18.3	18.2	15.7
Native American	16.0	19.1	21.3	21.5	22.2
Gender					
Female	15.8	18.5	21.3	23.1	21.3
Male	25.9	20.5	18.9	18.1	16.6
Foreign-Born					
No	21.1	19.8	20.3	20.5	18.3
Yes	20.5	17.8	18.7	20.6	22.4
Educational Attainment					
Less Than High School	12.3	16.3	19.8	23.6	28.0
High School	18.1	20.3	21.0	21.8	18.8
Some College	21.9	20.0	20.3	20.3	17.5
Associate Degree	23.2	22.9	23.0	17.5	13.4
Bachelor's Degree	30.6	20.6	19.3	17.6	11.8
Master's Degree	28.8	16.2	20.2	22.4	12.3
Professional Degree	30.4	23.8	24.7	12.7	8.5
Doctoral Degree	26.8	13.4	25.4	22.5	11.9

Note: Rows sum to 100%. Data on education comes from the long-form of the 2000 Decennial Census, which includes approximately one-sixth of the workers in our data. Education results are calculated solely for these workers and solely for the year 2000.

Figure 2.2
Cumulative Net Employment Growth by Firm Effects Quintile and by Year, 1992-2003



Note: Each bar represents cumulative employment growth within a quintile for a year in 1993-2003 relative to 1992

Table 2.4

Distribution of Employment (Percentages) within Firm Effects Quintiles, 1992 versus 2003

	1992 Firm Effects Quintile (1=Highest)					2003 Firm Effects Quintile (1=Highest)				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Industry										
Agriculture	0.2	0.6	0.8	1.2	6.0	0.2	0.5	0.7	1.1	5.2
Mining	0.9	0.3	0.2	0.2	0.1	0.5	0.2	0.1	0.1	0.0
Utilities	3.2	1.4	0.3	0.1	0.0	2.3	1.0	0.2	0.1	0.1
Construction	5.9	4.9	3.1	2.2	1.7	6.7	5.6	3.9	2.7	1.7
Non-Durable Manufacturing	12.5	13.7	9.4	5.9	6.4	9.2	9.9	6.3	4.1	3.2
Durable Manufacturing	24.0	12.6	7.7	5.5	3.4	15.2	9.3	6.0	4.1	2.1
Wholesale Trade	7.0	5.6	4.4	2.7	2.1	7.8	5.7	4.8	2.6	2.0
Retail Trade	4.3	4.7	12.4	21.4	15.5	5.8	5.8	14.7	21.4	13.6
Transportation	2.4	4.9	4.2	3.3	3.1	2.6	4.5	4.2	3.5	2.8
Services										
Information	7.9	2.4	1.7	1.6	1.6	7.8	3.1	1.4	1.2	1.5
Finance	6.2	9.6	6.3	3.2	0.5	8.1	9.6	4.4	2.4	0.5
Real Estate	1.1	0.9	1.1	1.0	1.3	1.4	1.1	1.3	1.2	1.5
Professional Services	11.0	3.5	2.1	1.2	2.1	13.5	3.8	2.1	1.5	3.2
Management	1.6	1.1	0.4	0.3	0.2	1.5	1.3	0.5	0.2	0.2
Administrative	2.5	2.2	3.3	6.9	10.3	4.2	3.6	4.8	9.0	13.8
Education	0.2	2.8	12.3	19.7	12.5	0.6	2.7	12.9	21.2	13.4
Health Care	2.8	15.8	17.5	8.0	6.8	4.5	16.7	18.4	8.5	7.6
Entertainment	0.4	0.4	0.8	1.8	2.8	0.6	1.0	1.2	2.0	3.6
Accommodation & Food	0.6	1.1	3.3	9.4	18.9	1.1	1.6	3.1	8.3	19.0
Other	1.5	1.3	1.4	2.0	3.0	1.5	1.5	1.6	1.8	3.4
Public Administration	3.7	10.2	7.1	2.6	1.7	5.0	11.5	7.4	2.8	1.7

Note: Columns sum to 100%.

Table 2.5

Distribution of Employment (Percentages) within Person Effects Quintiles, 1992 versus 2003

	1992 Person Effects Quintile (1=Highest)					2003 Person Effects Quintile (1=Highest)				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Industry										
Agriculture	0.2	0.2	0.6	1.5	6.2	0.2	0.4	0.6	1.0	5.4
Mining	0.7	0.5	0.3	0.1	0.0	0.6	0.3	0.1	0.0	0.0
Utilities	4.2	0.7	0.2	0.0	0.0	3.2	0.6	0.1	0.0	0.0
Construction	6.5	5.6	3.1	1.6	1.1	8.7	6.1	3.0	1.9	1.5
Non-Durable Manufacturing	9.0	10.2	10.8	10.3	7.8	8.5	9.0	7.9	4.6	2.8
Durable Manufacturing	18.6	14.2	11.1	7.4	2.3	16.3	9.4	7.2	3.7	1.2
Wholesale Trade	6.6	6.0	4.8	2.7	1.7	7.7	6.1	4.4	3.2	1.8
Retail Trade	3.7	5.8	15.1	18.7	14.9	4.6	6.6	10.7	18.4	20.6
Transportation	4.1	5.9	3.8	2.0	2.0	3.1	6.1	3.9	2.5	1.9
Services										
Information	6.6	3.7	2.1	1.5	1.3	8.5	3.0	1.9	1.1	1.3
Finance	8.7	9.5	4.6	2.5	0.6	9.6	8.5	5.8	1.5	0.4
Real Estate	0.9	0.9	1.3	1.4	0.9	1.1	1.2	1.5	1.4	1.3
Professional Services	11.8	2.8	2.0	1.4	2.1	14.9	3.6	2.2	2.2	2.5
Management	1.9	0.7	0.5	0.3	0.3	1.7	0.8	0.6	0.5	0.3
Administrative	1.6	2.6	3.0	5.0	12.9	2.9	3.9	4.8	7.7	16.0
Education	2.6	12.0	12.8	12.1	7.7	1.7	5.7	12.6	23.6	4.9
Health Care	6.4	8.0	12.7	12.2	11.6	2.9	12.6	17.4	12.2	9.0
Entertainment	0.3	0.4	1.2	2.4	2.0	0.3	0.7	1.5	2.2	3.5
Accommodation & Food	0.4	0.2	2.1	10.7	19.6	0.3	0.8	2.7	7.9	21.1
Other	0.9	1.2	1.5	2.5	3.0	1.0	1.6	1.8	1.9	3.5
Public Administration	4.1	9.0	6.5	3.8	1.9	2.2	13.0	9.4	2.5	1.0

Note: Columns sum to 100%.

Table 2.6

Distribution of Employment (Percentages) by Industry within Person Effects Quintiles, at Firms Where Firm Fixed Effects Quintile Is Better Than Person Fixed Effects Quintile

	1992					2003				
	Person Effects Quintile (1=Highest)					Person Effects Quintile (1=Highest)				
Industry	**2**	**3**	**4**	**5**	**Total**	**2**	**3**	**4**	**5**	**Total**
Agriculture	0.2	0.5	1.2	2.8	1.3	0.2	0.3	0.9	2.0	0.9
Mining	1.0	0.4	0.1	0.0	0.3	0.4	0.1	0.0	0.0	0.1
Utilities	1.3	0.2	0.0	0.0	0.3	1.0	0.1	0.0	0.0	0.2
Construction	6.5	3.8	1.7	0.9	2.9	7.6	3.7	3.1	2.0	3.8
Non-Durable Manufacturing	14.6	17.3	15.8	9.4	14.2	11.3	11.2	6.8	2.9	7.7
Durable Manufacturing	24.1	16.8	10.0	2.8	12.4	10.8	7.7	5.1	1.5	5.8
Wholesale Trade	6.2	5.4	2.5	1.3	3.6	6.3	5.5	5.5	1.9	4.7
Retail Trade	4.7	5.4	9.0	15.6	9.1	5.2	7.0	19.2	30.3	16.6
Transportation	3.0	4.5	2.1	1.4	2.7	4.4	3.6	2.7	1.4	2.9
Services										
Information	7.1	2.9	1.1	0.8	2.6	4.3	2.5	1.0	0.8	1.9
Finance	6.1	6.1	4.0	0.9	4.1	10.3	5.7	2.1	0.5	4.0
Real Estate	1.2	1.1	1.1	0.6	1.0	1.5	1.4	1.5	1.1	1.3
Professional Services	4.2	2.0	1.4	1.2	2.0	7.7	2.9	2.1	1.7	3.2
Management	0.7	0.6	0.4	0.5	0.5	1.2	1.0	1.0	0.5	0.9
Administrative	3.2	3.4	3.2	10.9	5.3	4.3	4.1	5.9	15.8	7.9
Education	0.2	1.3	9.8	11.1	6.2	0.4	3.8	11.7	4.9	5.8
Health Care	4.4	15.5	20.1	19.1	15.7	6.8	19.8	18.2	9.8	14.4
Entertainment	0.3	0.5	1.5	1.0	0.9	0.7	1.8	2.1	2.9	2.0
Accommodation & Food	0.2	1.1	5.8	14.9	6.1	0.8	1.4	5.2	16.8	6.6
Other	2.1	1.7	2.4	2.4	2.2	1.9	1.9	1.9	2.7	2.1
Public Administration	8.6	9.2	6.9	2.5	6.6	13.0	14.3	4.1	0.6	7.4

Note: Columns sum to 100%.

Table 2.7

Mean Firm Fixed Effects and Person Fixed Effects by Industry

	Firm Fixed Effects		Person Fixed Effects	
Industry	**1992**	**2003**	**1992**	**2003**
Agriculture	-0.30	-0.29	-0.29	-0.25
Mining	0.15	0.12	0.13	0.15
Utilities	0.18	0.17	0.20	0.22
Construction	0.07	0.07	0.05	0.08
Non-Durable Manufacturing	0.03	0.05	-0.02	0.03
Durable Manufacturing	0.10	0.11	0.07	0.11
Wholesale Trade	0.07	0.09	0.05	0.06
Retail Trade	-0.07	-0.06	-0.10	-0.11
Transportation	-0.01	-0.01	0.02	0.01
Services				
Information	0.10	0.13	0.09	0.13
Finance	0.08	0.12	0.09	0.10
Real Estate	-0.01	-0.01	-0.04	-0.04
Professional Services	0.13	0.15	0.13	0.13
Management	0.11	0.11	0.11	0.08
Administrative	-0.12	-0.12	-0.16	-0.13
Education	-0.10	-0.10	-0.05	-0.08
Health Care	-0.01	0.00	-0.06	-0.05
Entertainment	-0.14	-0.13	-0.12	-0.14
Accommodation & Food	-0.18	-0.19	-0.22	-0.22
Other	-0.07	-0.07	-0.11	-0.10
Public Administration	0.04	0.05	0.02	0.02

Table 2.8

Distribution of Employment (Percentages) across Firm Effects Quintiles, 1992 versus 2003

	1992					2003				
	Firm Effects Quintile (1=Highest)					Firm Effects Quintile (1=Highest)				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Person Effects Quintile										
1	63.6	26.3	8.0	1.9	0.3	67.7	22.4	7.6	1.8	0.6
2	25.8	34.1	23.2	13.0	3.9	24.9	38.6	24.4	9.9	2.2
3	9.3	25.7	33.7	21.9	9.4	10.5	25.6	33.7	22.4	7.8
4	2.4	12.6	25.5	37.9	21.6	3.7	6.8	24.2	40.0	25.4
5	0.2	1.6	10.2	26.8	61.1	2.4	2.5	7.8	27.2	60.1

Note: Rows sum to 100%.

Figure 2.31
Employment over Time within Person Effects Quintile 1, 1992-2003

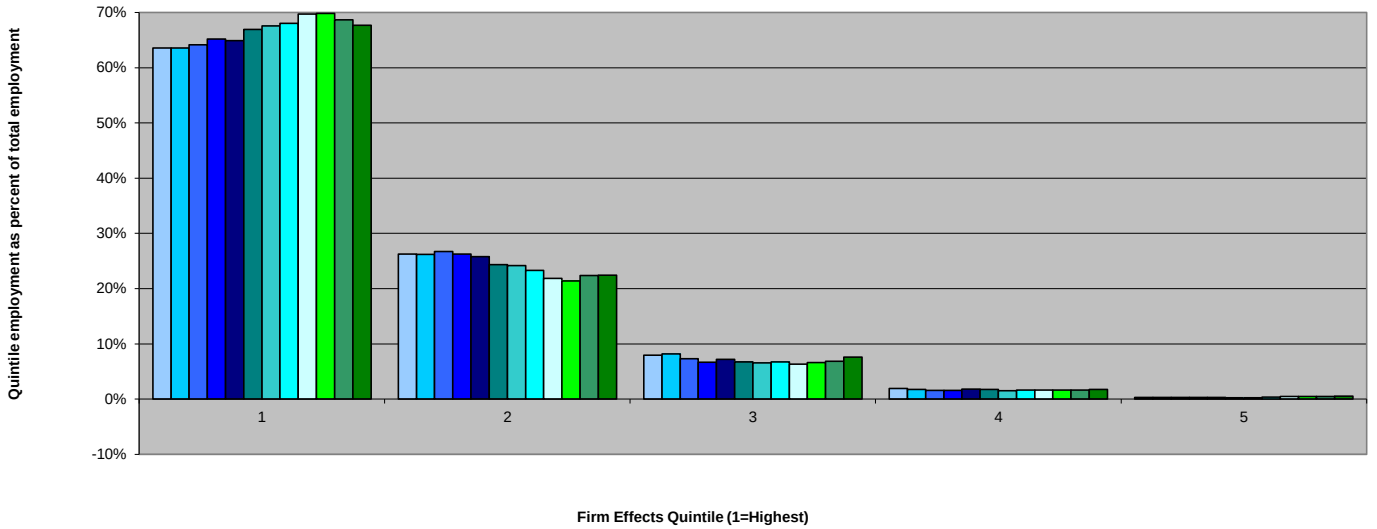


Figure 2.32
Employment over Time within Person Effects Quintile 2, 1992-2003

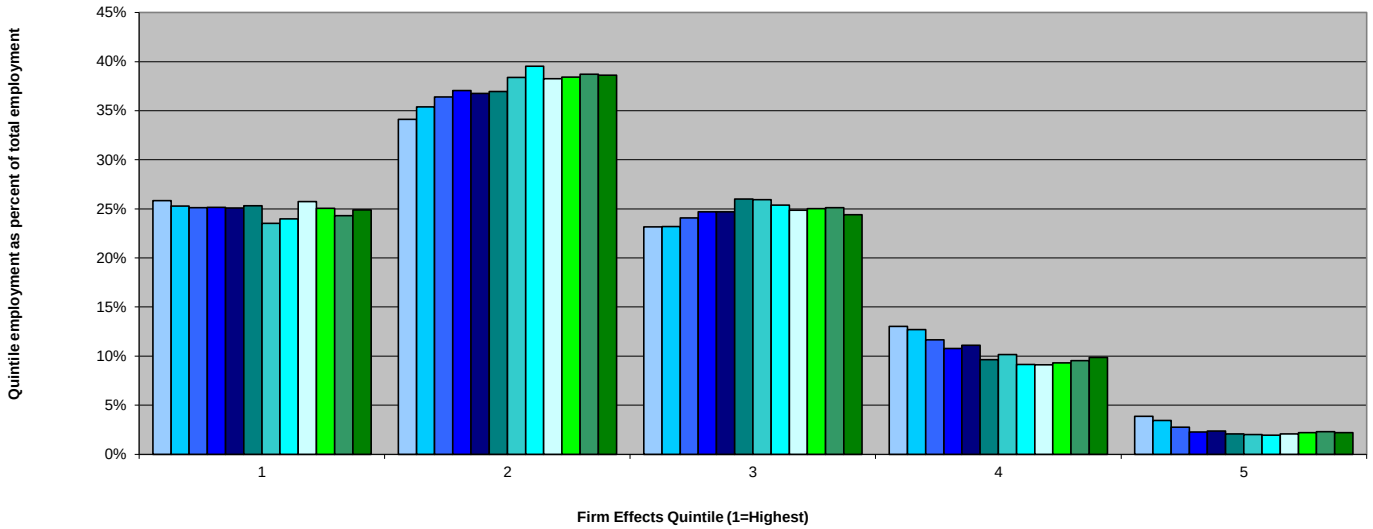


Figure 2.33
Employment over Time within Person Effects Quintile 3, 1992-2003

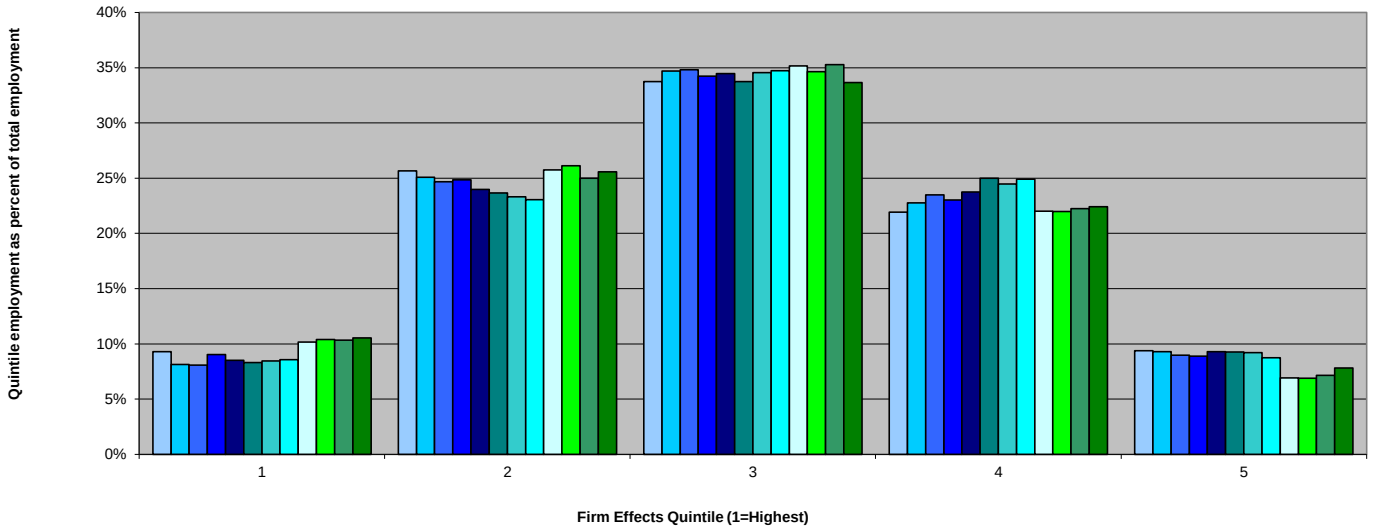


Figure 2.34
Employment over Time within Person Effects Quintile 4, 1992-2003

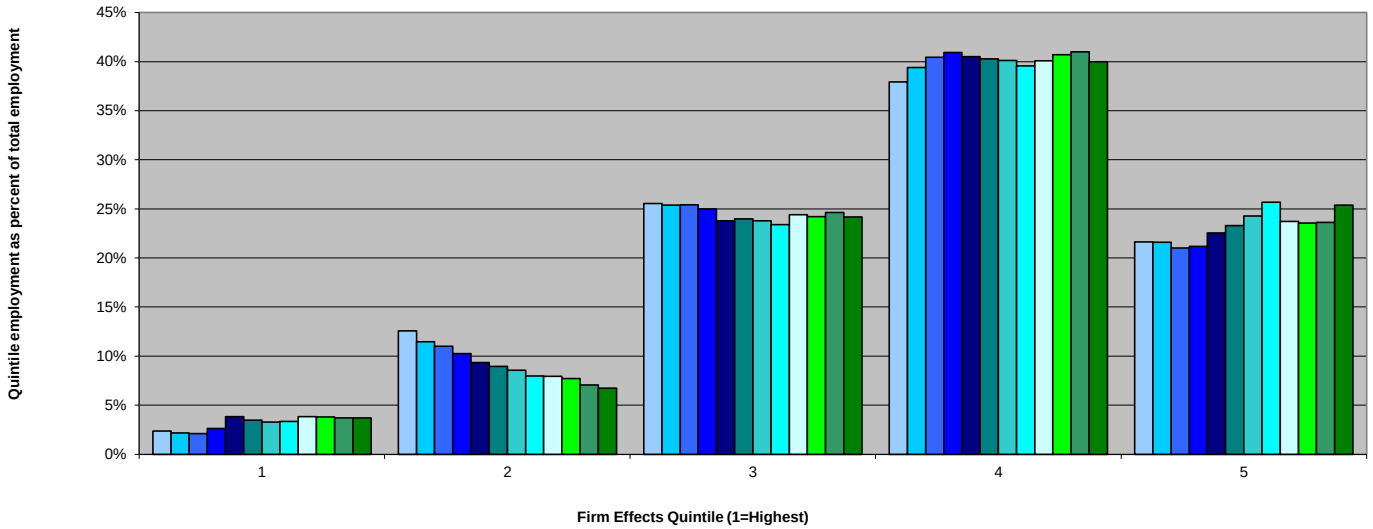


Figure 2.35
Employment over Time within Person Effects Quintile 5, 1992-2003

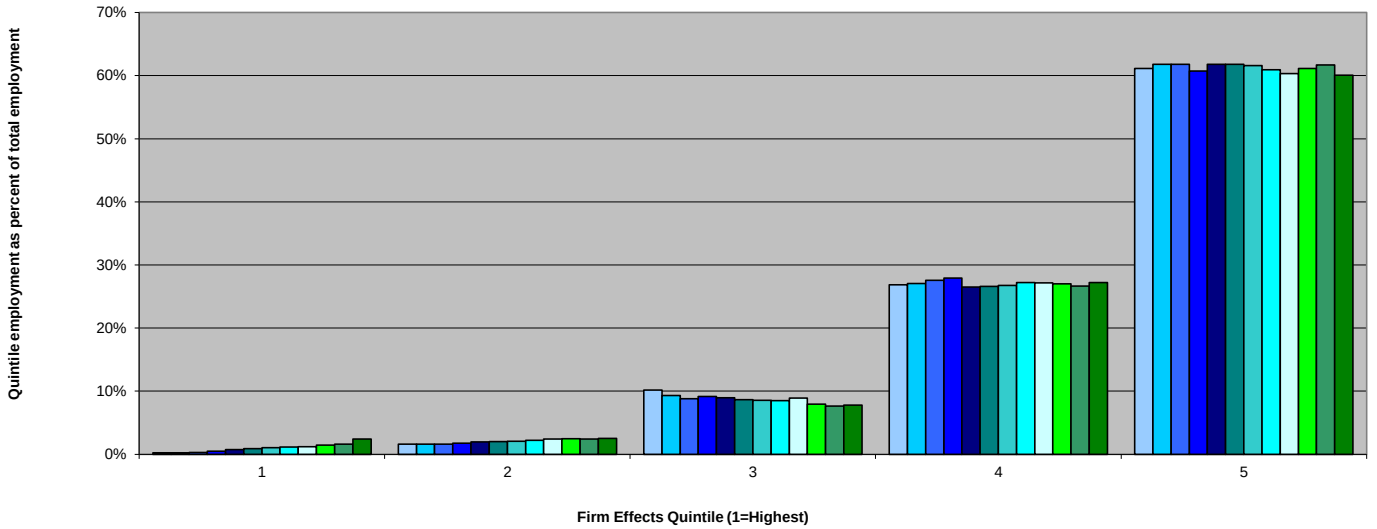
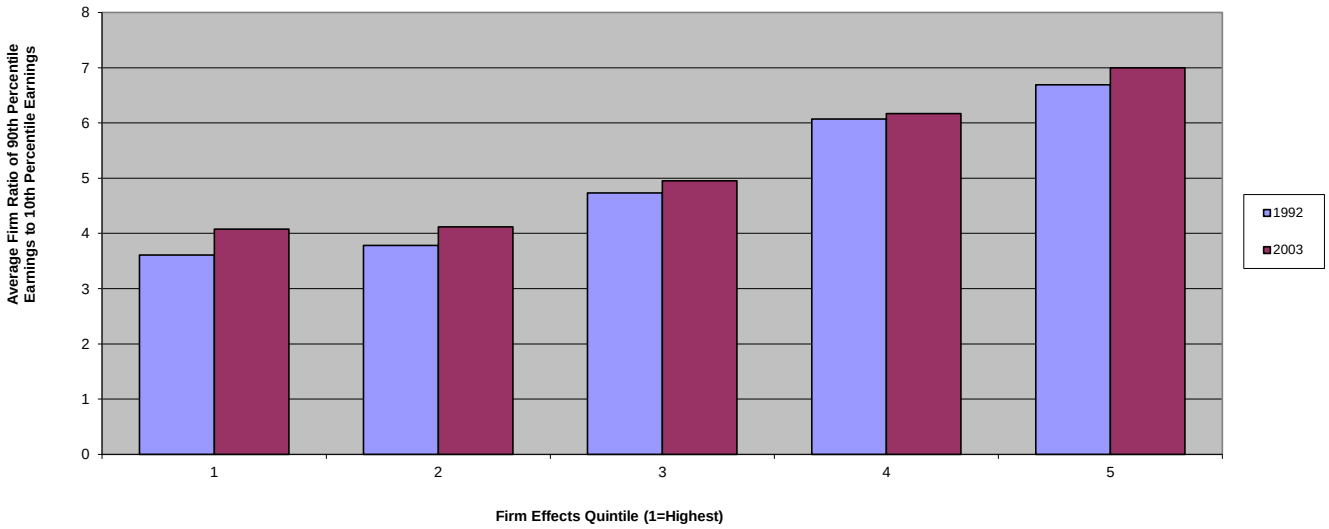



Figure 2.4
Average Earnings Differential by Firm Effects Quintile, 1992 versus 2003