Fast Track Positions and Human Capital Acquisition

Adam Clemens

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Abstract

Some positions within a firm consistently lead to promotion with a higher probability than other positions at the same hierarchical level. Therefore, serial correlation of promotion rates is not indicative merely of fast individuals with high innate ability but of fast tracks within the organization. I describe these positions as fast track jobs and present a model in which they involve the acquisition of human capital more valuable at the next level. Data from a financial services firm confirms that workers in fast track jobs are younger than other workers in the same level and that transfers out of the fast track to the slow track are common. Thus, the process of grooming workers for advancement is analogous to more aggressive up-or-out systems. There is some evidence that fast track effects are not the result of signaling or of accelerated learning about the worker's innate ability.

1. Introduction

Studies of career tracks within firms have repeatedly shown that time to promotion is serially correlated, a phenomenon which has been described as a fast track effect. It is not surprising, since rapid promotion suggests high innate ability which should in turn predict further promotion. This observation, however, tells us nothing about the role of organizational strategy in career development. It is an observation of fast people, without reference to specific career tracks. Are these high-ability individuals seeded randomly throughout the organization? Can their job assignment play a role in their rapid climb? The first purpose of this paper is to introduce a conceptual distinction between advancement-prone individuals and advancement-friendly positions within the firm.

I define fast tracks as positions in the organization that are systematically staffed with workers who will be subsequently promoted at a higher rate than colleagues at the same hierarchical level. Empirically, the impact of these positions on career advancement is difficult to distinguish from the innate ability of the workers because job assignment is endogenous. The fact that fast climbers are concentrated in these jobs, however, suggests that there is something unique about these jobs which plays a role in the firm's strategy. The marginal impact of fast track jobs is weaker after controlling for serial correlation; therefore the effect of fast tracks as I define them is related to the observation of fast people. Identifying the fast tracks and comparing their composition and outcomes against other positions provides clues to how the firm recognizes and develops workers with managerial talent, as well as the nature of contracting between workers and the firm.

I show that some positions consistently lead to a higher probability of promotion than other positions at the same hierarchical level within the firm. My data comes from the personnel records of the same U.S. financial services firm studied in Baker, Gibbs and Holmstrom (1994a and b), hereafter referred to as BGH. I offer an interpretation of this as being due to differences in the human capital acquired in these positions. Several stylized facts about fast tracks are reported, which help to separate this interpretation from alternative theories and can help inform future theories of organizational strategy and the worker-firm relationship.

In particular, wages in fast tracks are informative about the importance of long-term contracting. Incentives can be intensified by paying workers less than their productivity before promotion and more than productivity after promotion; this motivation for steep income profiles could be stronger in the case of workers who perceive a higher probability of their promotion. However, this incentive effect could be offset by a consumption-smoothing effect since those same workers also have higher expected lifetime earnings. These offsetting effects would limit the impact of a long-term contract and allow earnings profiles to approximately fit productivity. I find that wages are higher in fast tracks than other positions at the same hierarchical level, even after controlling for observable worker characteristics.

Fast track jobs have an inconsistent impact on exit and, in general, increase it. In contrast, bonuses, a mechanism for the firm to send signals to the worker, raise the probability of promotion and lower the probability of exit, with both of these effects magnified by the same worker characteristics. The Gibbons and Waldman framework for career dynamics is silent on exit, as it requires knowledge of outside firms and how they differ from the current one. It has been concluded in BGH that exit rates in this firm have little to do with hierarchical level, tenure and salary. A similar conclusion is made for a different American firm by Gibbs and Hendricks.

Fast track jobs have greater impact on younger workers, and do not have greater impact on less educated workers, as they should if they operate by lowering the costs of sending further signals to the outside market through promotion. The workers placed in fast tracks and the flows between fast and slow tracks suggest that rather than an orderly succession enabling ability to be learned more perfectly, workers are given a chance early to be groomed for advancement. Fast track jobs are staffed by younger, less tenured and more educated workers. As would be expected when younger workers are placed in fast tracks, lateral transfers either to a faster track or a slower one are common, and laterals out of the fast track are more common than into it. Some of the workers initially selected for grooming are weeded out, analogous to more aggressive up-or-out systems.

The long-term impact of having been in a fast track is theoretically ambiguous and empirically mixed. After the initial promotion out of a fast track job, the advantage of valuable human capital acquired is confounded by the high innate ability of rivals promoted from less favorable positions. Since both experience and innate ability enter into the immediate promotion decision, either effect can dominate in predicting subsequent promotions. There does not appear to be a fast ladder to the top.

Literature Review

In the seminal study of a firm's personnel records, BGH reports that the probability of a worker being promoted to the next hierarchical level is decreasing in the time she spent at the previous level, so that rapid promotions are serially correlated. The authors refer to this phenomenon as a fast track. This stylized fact is confirmed in the 19th Century records of the Union Bank of Australia by Seltzer and Merrett (2000), in a British financial sector firm by

Treble, van Gameren and Bridges (2001), in the Dutch aircraft manufacturer Fokker by Dohmen, Kriechel and Pfann (2004), and in a large U.S. firm by Gibbs and Hendricks (2004). Chiappori, Salanie and Valentin (1999) find momentum in promotions among executives at a French state-owned firm.

There has been some attempt to separate serial correlation from time-invariant unobserved worker heterogeneity. Ariga, Ohkusa and Brunello (1999) find in a Japanese high-tech manufacturing firm that this serial correlation of promotions remains after controlling for worker fixed effects, and argue that if fast climbing is not purely in the worker's genes then there are differences in human capital acquisition. Belzil and Bognanno (2004, 2006) examine panel data of executives across many firms and similarly control for worker fixed effects, finding that the remaining serial correlation of promotions is quite heterogeneous, which they interpret as signaling in some circumstances and a Peter Principle in others. Meyer (1991, 1992) provides theoretical justifications for persistently favoring early winners both from a boundedly rational learning perspective and from an incentive perspective.

A model of career advancement and wage growth fitting several stylized facts is presented in Gibbons and Waldman (1999). They present promotions in large organizations as being determined by a standard rather than a tournament. The standard is one of effective ability, a function of career experience which is perfectly observed and of innate ability which is revealed over time to the worker and firm. This model is augmented in Gibbons and Waldman (2006) to allow experience in one position to be less applicable in another, so that optimal allocation depends not only on immediate productivity but on the future value of human capital acquired in the current period.

An alternative to symmetric learning about worker ability is presented in Berhardt (1995) and in DeVaro and Waldman (2007), where job assignment sends signals to competing firms that do not observe productivity but have some information about ability through education. Waldman (1984, 1990) also explores the implications of job assignment as a signal to the labor market. Prendergast (1992) offers another alternative, where the firm is better informed than the worker and signals to the worker can encourage her to engage in costly acquisition of firm-specific human capital.

Other papers have examined how fast tracks affect worker entry into the firm. Bretz, Rynes and Quinn-Trank (2002) show that firms with clear fast tracks have an advantage in attracting high achievers. Bernhardt and Scoones (1998) show that in the presence of long-term contracts and competition, firm-specific capital accumulation forces the competition for workers to occur in the initial period, when firms cannot exploit asymmetric information about workers, leaving a larger share of surplus for the workers.

2. Theory

I take as a starting point the Gibbons and Waldman framework in which workers are paid the expected value of their productivity in a given year. The productivity of worker *i* assigned to job *j* in time period *t* is given by

$$y_{ijt} = d_j + c_j(\eta_{it} + \varepsilon_{ijt})$$

Where higher-level jobs have a steeper slope with respect to ability and a lower intercept so that $c_2 > c_1$ and $d_2 < d_1$. Effective ability η_{it} is a function of innate ability θ, known to take on one of two values θ_L and θ_H, and human capital acquired from experience x.

$$\eta_{it} = \theta_i f(x_{it})$$

However, neither innate ability nor effective ability are perfectly observed. Each period the firm's (and worker's) information about the worker's ability is updated with the worker's normalized output defined as

$$z_{it} = \frac{y_{ijt} - d_j}{c_j} = \eta_{it} + \varepsilon_{ijt}$$

And a new belief is formed about the innate ability:

$$\theta^e{}_{it} = E(\theta_i | \theta^e{}_{i0}, z_{it-x}, \ . \ . \ . \ , z_{it-1})$$

In Gibbons and Waldman (2006), education is modeled as the sole source of prior information on innate ability; I generalize this to anything forming prior beliefs about ability. In this model, there is only one job at each hierarchical level. In reality, there are different jobs within a hierarchical level and they do not have the same probability of leading to promotion.

My innovation is to model two different level one jobs, which I label Position 1s and Position 1f to designate fast and slow, and allow the experience gained in them to be of unequal value in the production function for level 2. Experience in the slow job is discounted at rate $\alpha < 1$ upon promotion.

In order for some workers to be allocated in equilibrium to the job that acquires less valuable experience, I assume that it has a compensating higher intercept d. This could be due to some time and resources being spent on additional training in the fast job. Therefore, a worker's immediate productivity is higher in the slow job 1s than it would be in 1f, but her long-run value may be increased by placing her in 1s if she is likely to later be promoted. The slope is the same, because otherwise the fast job would in fact be a higher level job and there would be a motivation to allocate more experienced workers to it.

$$y_{i1ft} = d_{1f} + c_1\big(\theta_i f(x_{it}) + \varepsilon_{i1ft}\big)$$

$$y_{i1st} = d_{1s} + c_1(\theta_i f(x_{it}) + \varepsilon_{i1st})$$

$$y_{i2t} = d_2 + c_2\big(\theta_i f(x_{i2t} + x_{i1ft} + \alpha x_{i1st}) + \varepsilon_{i2t}\big)$$

$$d_2 < d_{1f} < d_{1s}$$

For simplicity, I restrict the model to three periods. In the third period, there is no reason to allocate a worker to a fast job, because without any remaining future the only relevant consideration is immediate productivity. Therefore the relevant problem is

$$V_3 = \ max\,\{ d_{1s} + c_1\theta^e{}_{i3} f\big(x_s + x_f\big)\,, d_2 + c_2\theta^e{}_{i3} f\big(\alpha x_s + x_f\big)\}$$

Where x_s refers to experience in Position 1s and x_f to experience in either the fast track job 1f or level 2.

Allocation in the previous periods requires consideration not only of the present production function but of the differing continuation values of experience. These depend upon time, amount of experience in the slow track, amount of experience in the fast track or second level, and perceived innate ability. Technically, since time and the two types of experience are linearly dependent, one could be omitted from the notation, but I find it more intuitive to denote all three. In the second period the firm must solve

$$V_2 = max\,\{ d_{1s} + c_1\theta^e{}_{i2} f\big(x_s + x_f\big) + V_3\big(x_s + 1, x_f; \theta^e{}_{i2}\big), \quad d_{1f} + c_1\theta^e{}_{i2} f\big(x_s + x_f\big)$$
$$+ V_3\big(x_s, x_f + 1; \theta^e{}_{i2}\big)\,, \quad d_2 + c_2\theta^e{}_{i2} f\big(\alpha x_s + x_f\big) + V_3\big(x_s, x_f + 1; \theta^e{}_{i2}\big)\}$$

I assume that θ_H is not sufficiently high for it to ever be optimal to allocate a worker to level 2 in the first period, so that the first period allocation problem is

$$V_1 = max\,\{\,d_{1s} + c_1\theta^e{}_{i1}f(0) + V_2(1,0;\theta^e{}_{i1}), \quad d_{1f} + c_1\theta^e{}_{i1}f(0) + V_2(0,1;\theta^e{}_{i1})\,\}$$

Thus, for each period and each package of experience there exist threshold values of perceived innate ability which determine optimal placement that period. Let $\theta'{}_1$ denote the innate ability level that solves $d_{1s} + c_1\theta^e{}_{i1}f(0) + V_2(1,0;\theta^e{}_{i1}) = \ d_{1f} + c_1\theta^e{}_{i1}f(0) + V_2(0,1;\theta^e{}_{i1})$, that is, a worker with that perceived innate ability upon hiring is equally valuable in either the fast or slow track the first period. Similarly, let $\theta'{}_2(x_s,x_f)$ be the value of $\theta^e{}_{i2}$ that solves $d_{1s} + c_1\theta^e{}_{i2}f\left(x_s + x_f\right) + V_3\left(x_s+1,x_f;\theta^e{}_{i2}\right) = \ d_{1f} + c_1\theta^e{}_{i2}f\left(x_s + x_f\right) + V_3\left(x_s,x_f+1;\theta^e{}_{i2}\right)$, noting that the ability level which implies indifference depends upon the experience acquired in period one. For promotion, let $\theta''{}_2(x_s,x_f)$ imply indifference in period two: $d_{1f} + c_1\theta^e{}_{i2}f\left(x_s + x_f\right) + V_3\left(x_s,x_f+1;\theta^e{}_{i2}\right) = d_2 + c_2\theta^e{}_{i2}f\left(\alpha x_s + x_f\right) + V_3\left(x_s,x_f + 1;\theta^e{}_{i2}\right)$. Finally, the threshold for allocation to Position 2 in period three (which may or may not be a promotion) is $\theta''{}_3(x_s,x_f)$ and solves $d_{1s} + c_1\theta^e{}_{i3}f\left(x_s + x_f\right) = d_2 + c_2\theta^e{}_{i3}f\left(\alpha x_s + x_f\right)$. Proposition 1 describes the assignment rule. Proofs are given in the appendix.

Proposition 1: Suppose that $\theta'{}_2\left(x_s,x_f\right) < \theta''{}_2\left(x_s,x_f\right)$ so that some workers are optimally allocated to Position 1f in the second period. Then: (i) If $\theta^e{}_{i1} > \theta'{}_1$ then worker *i* is assigned to Position 1f in period one, otherwise to Position 1s. (ii) If $\theta'{}_2(x_s,x_f) < \theta^e{}_{i2} < \theta''{}_2(x_s,x_f)$ then *i* is assigned to Position 1f in period two, and assigned to 1s if $\theta^e{}_{i2} < \theta'{}_2(x_s,x_f)$. (iii) If $\theta^e{}_{i2} > \theta''{}_2(x_s,x_f)$ then worker *i* is promoted to Position 2 in period two. (iv) If $\theta^e{}_{i3} > \theta''{}_3(x_s,x_f)$ then worker *i* is assigned to Position 2 in period three, otherwise to Position 1s.

More able workers are allocated to the Position 2 to take advantage of the steeper slope, and within the lower level, more able workers are allocated to the fast track because of their greater likelihood of its later advantage being realized.

Since learning about innate ability occurs over time, the distribution of perceived ability has a higher variance, and each belief has lower variance surrounding it, in each period. The realizations of perceived ability approach the true values θ_L and θ_H. This creates a motivation to delay placement in the fast track to period two, by which time there is greater confidence of whether the worker will be promoted in period three. There is an opposing motivation to allocate workers to the fast track early to acquire more valuable experience, especially if some will be promoted in period two. I make an assumption that the latter motivation is dominant.

Assumption 1: $F_1(\theta'_1) < F_2(\theta'_2(1,0)|\theta^e{}_{i1} < \theta'_1)$ That is, the probability of remaining in the slow track Position 1s in the second period, conditional on having been placed there in the first period, is greater than the unconditional probability of being initially placed in the slow track.

Essentially, the interpretation is that the firm picks some workers whom it initially sees as promising and places them in fast tracks, and it is easier to appear promising at the start of one's career with no baggage than after already having been passed over. I will further make an assumption about the promotion rate from the fast track in period two relative to the cutoff for transfer to the slow track.

Assumption 2: $\left[F_2\left(\theta''_2(0,1)\right) - F_2\left(\theta'_2(0,1)\right)\middle|\theta^e{}_{i1} > \theta'_1\right] < 1 - F_1(\theta'_1)$ That is, the probability of remaining in the fast track Position 1f in the second period, conditional on having been placed there in the first period, is less than the unconditional probability of initially being placed in the fast track.

This seems plausible because there are two ways out of the fast track: a worker who has been marked for promotion can accordingly be promoted, or if she does not perform as hoped she can be relegated to the slow track. The firm first takes a chance on workers and develops them in a fast track, then weeds some out.

Proposition 2: The average age among workers in Position 1f is lower than among workers in Position 1s.

I will make one more assumption, that placement of a worker in the fast track does not irrevocably mark her for promotion. Even with the higher quality of human capital acquired, the firm can change its mind about the worker's innate ability and move her to the slow track. This implies that the variance of learning shocks is large enough for some negative shocks to dominate human capital advantages.

Assumption 3: $[F_2(\theta'_2(0,1)|\theta^e_{i1} > \theta'_1)] > 0$, $\left[F_3\left(\theta''_3(1,1)\middle|\theta^e_{i2} > \theta'_2(1,0)\right)\right] > 0$ and $\left[F_3\left(\theta''_3(0,2)\middle|\theta^e_{i2} > \theta'_2(0,1)\right)\right] > 0$.

Alternative Explanations of Persistent Differences in Job Promotion Rates

The model offered above, driven by different quality of experience between jobs, is one possible explanation of fast track jobs. However, there is no way to directly measure this, and there are other ways to think about a relationship between job title and promotion prospects.

Prendergast (1992) presents a model in which the firm has better information than the worker about her promotion prospects, and may use job assignment as a signal to the worker to invest in costly acquisition of firm-specific human capital that will yield a return on investment when the worker is promoted. If fast track positions motivate the worker to invest in firm-specific capital, than this same investment process which raises the probability of promotion should also lower the probability of subsequent exit. The model presented in this paper does not distinguish between general and firm-specific capital and makes no prediction about exit rates.

If signals from the firm to the worker do play a role in investment and subsequent promotion and exit, one possible signaling mechanism that could be observed is the payment of discretionary bonuses. Across firms or across different career tracks within a firm, bonuses and promotions may be substitutes as different forms of incentive; however, within a career they may well be complementary because the incentive effect of possible promotion is dependent upon the worker's beliefs about her promotion prospects. Bonuses may therefore lead to promotion and reduce the probability of exit because of greater investment in firm-specific skills.

Bernhardt (1995) and DeVaro and Waldman (2007) argue that promotions send signals to the outside labor market about the worker's ability, which is costly to the firm. Therefore, promotion is less costly for workers about whom the market is better informed. Fast track jobs could lead to promotion by signaling high ability to the market and therefore lowering the damage of an additional signal accompanying promotion. The more formal education a worker has acquired, the greater the extent to which she has been sorted by the outside labor market and the lower the informative value of additional signals of ability. Therefore, the signaling effect of fast track positions should be more pronounced among less educated workers. Again, there is no parallel prediction from the human capital acquisition model.

Another mechanism through which fast track jobs could lead to promotion is though more sensitive detection by the employer of the worker's ability. In this case, workers discovered to be high types are quickly promoted while others are discovered to be low types and subsequently paid less or forced out. This would imply higher exit rates and a wider variation in annual wage increases (or decreases).

Finally, even if jobs have been labeled by the observer as belonging to the same hierarchical level, one may in fact simply be better and higher paying than the other. Workers in the better jobs are more able and closer to the threshold for further promotion. Since among the observed hierarchical levels in this firm, average age is uniformly increasing with level, it seems reasonable to expect that these *de facto* higher level jobs would also be staffed with more experienced workers than others of the same official level. In contrast, the model presented here predicts that these jobs are staffed with younger workers, because they are chosen not for their present ability but for their future value in higher positions.

3. Data

The data comes from the personnel records of a U.S. financial services firm described extensively in BGH. There are eight hierarchical levels within the firm, the lower four of which are of similar size, while beyond level four the hierarchy tapers dramatically. Observations consist of year-end snapshots running from 1969 to 1988. Tenure at the firm is only observed for workers entering after 1969, so roughly a quarter of observations are without an entry for tenure.

I observe both a worker's title and her classification into one of twenty functions. Together a title and a function define a job. For each job and each year, I construct a metric of the past rate at which that job has led to promotion, which I refer to throughout the paper as the 'job promotion rate' and which is defined as the number of promotions from that job in previous years divided by the total number of observations in that job in previous years.

In Table 1a, for each of the first four hierarchical levels I summarize this variable both over the whole sample and in exclusively the final year, at which point the variable describes the job's average promotion rate over the full length of the sample. Of course, it cannot be observed which workers in a given job in 1988 are promoted to a new level in 1989, so the history terminates with promotions out of 1987 jobs. Among these 1988 values summarizing the whole history, the 25th percentile among level 2 jobs is less than half the 75th percentile, while in the other levels the 25th percentile is roughly two-thirds the value of the 75th percentile. Table 1b confirms that these differences across job promotion rates differ significantly from 0; within each of the first four levels the F-statistic associated with job fixed effects has a probability rounded to 0 by the analytic software.

In Table 1c I summarize individual characteristics as well as some outcomes. The average employee is 39 years old and has about 15 years of education and four years of tenure at the firm. A quarter of employees are female. The (geometric) mean wage in 1988 dollars is just under $50,000. I use the geometric mean because my results include empirical models predicting means and variances of log income. The unconditional expected size of a bonus is 2.7% of base salary, since often no bonus is given. However, among bonuses actually given the average size is about 11.6% of base salary. For each worker, I construct a promotion premium, which I define as the difference between their average log raise in promotion years and their average log raise in years when they are not promoted. This has an average of about 3%.

The actual number of different jobs, as defined in this paper, is shown in Table 1d. Within each of the first six levels, jobs tend to proliferate over time, though the number of jobs in a level does not grow monotonically. By the end of the sample, there are 120 different jobs within level 2 and 98 within level 3, while only 28 in level 4. The number is still lower in the levels beyond 4, with no more than two jobs in level 7. The table has no entries for 1969 because I count only the jobs with an observed past promotion rate, and no job has any history in 1969.

4. Estimation Results

I present my results in three subsections: model-driven results, implications of alternatives, and additional findings. Table 2 shows the existence of fast track jobs and Table 3 shows that their effect is not fully explained by serial correlation of promotions. I show the demographic composition of fast tracks in Table 4, and Table 5 confirms that lateral transfers out of fast tracks are more common than into them. Table 6 confirms that wage growth is faster in fast track jobs.

Next I explore likely implications of alternative mechanisms for fast track jobs. In Tables 7 through 11 I contrast the impact and determinants of fast track jobs with those of discretionary bonuses to evaluate alternative explanations driven by signaling. Marginal effects of fast track jobs at different age and education levels appear in Figures 1 and 2. Table 12 and Figure 3 examine wage changes within levels to evaluate learning about worker ability in fast tracks.

Finally, I establish some additional stylized facts about fast tracks. Tables 13 and 14 show that pay is higher and has higher variance in fast track jobs. Table 15 shows the effects of lateral transfers on subsequent promotions. Table 16 shows that the persistent effect of fast tracks beyond the next promotion is ambiguous, and Table 17 shows promotions out of fast tracks are disproportionately into a different function.

Model-driven Results

In Table 2 I demonstrate that after controlling for observable characteristics, a job's *past* promotion rate is a significant and robust predictor of promotion for workers now in that job. There are, indeed, fast track jobs. Since the job promotion rate is a constructed right-hand-side variable with sampling error, coefficients are biased toward zero. The marginal effect from being in a job with a higher past promotion rate is .23 times the difference in job promotion rate. Within level 1 jobs, this marginal effect is .42, and it gradually declines with level. One standard deviation difference in job promotion rate within level 1 predicts a little over 5% higher probability of promotion. Younger workers with more education and more tenure are better candidates for promotion. Though not shown, job promotion rate during just the first two years of the sample has significant predictive power for promotions during any window of the sample.

In Table 3 I examine the BGH finding that odds of promotion are increasing in time spent in the current level while decreasing in time spent in the previous level – that is, that more rapid promotions are serially correlated. Both this effect and the effect of the job's past promotion rate are very significant when run simultaneously. The magnitude of each is reduced, though more so for job promotion rate. The marginal impact of one less year at the previous level, declining from 0.9% to 0.8%, falls well within its confidence interval; the marginal impact of the job promotion rate is roughly cut in half. People who have been climbing quickly are likely to be placed in fast track jobs.

Interestingly, education is not significant in Table 3, suggesting that a prior fast climbing rate is a stronger predictor of ability that dominates education. Since time in previous level is an indicator of innate ability, the remaining marginal effect of job promotion rate is somewhat more focused on capturing the value added from being placed in a fast job.

Workers are younger on average in fast track jobs, as shown in Table 4. To compare summary statistics, I used the sample of workers in the first four levels who are in jobs with promotion rates at or above the 75th percentile for their level, and compared them against workers in jobs at or below the 25th percentile. The fast track workers are about three years younger on average, have close to an additional year of education, and have about one tenth of a year less tenure. That difference is not so small because average observed tenure at the firm is only 4.4 years.

Assumption 3 predicted that lateral transfers should occur from the fast track to the slow track. Table 5 shows that this is so. In order for a transfer to be counted as a relocation from fast to slow or vice versa it must involve a 50% increase or a 33% decrease in job promotion rate relative to the previous position. Lateral transfers to a job with a lower promotion rate are 5% more common (2431 vs. 2310) than lateral transfers to a job with a higher promotion rate. Lateral transfers may occur for a variety of reasons outside the one-dimensional model, but the net effect is that the fast track is shedding workers over time, analogous to an up-or-out mechanism.

Raises are larger within fast track jobs, while lateral transfers to slower or faster tracks do not appear to be accompanied by otherwise unexpected wage changes. Since workers allocated to fast track jobs have higher innate ability, it is consistent that their productivity and their pay grow at a faster rate. A negative learning shock and a resulting move to a slow job with a higher intercept, or vice versa, has an ambiguous effect on expected pay. Table 6 shows that annual raises tend to be larger in fast track jobs, or for younger and less tenured workers. With or without controlling for these effects, however, the impact of being transferred in a given year to a faster or slower job on that year's accompanying raise is not significant. The general impact of job promotion rate on annual raises also disappears when worker characteristics are included.

Implications of Alternatives

I next turn my attention to the possibility of a signaling explanation for fast track effects. Table 7 considers the impact of a different signal, bonuses, on promotion and exit the following year. In all regressions involving bonuses (and not involving job promotion rate) I use fixed effects for each title and function rather than for each level. While bonuses may be substitutes for promotion when comparing across firms, within this firm they are complements. Bonuses increase the probability of promotion and decrease the probability of exit, and interaction terms reveal that each effect is stronger for older and less educated workers (though this is only significant for the interaction with age in predicting promotion). This is consistent with a hypothesis that bonuses motivate a worker to make firm-specific investments. Less educated workers are less informed about their own type and therefore may be more influenced by signals.

Table 8 indicates that for fast track jobs, the relationship between promotion and exit is precisely the opposite. Workers in fast track jobs are more likely both to be promoted and to exit, and there is weak evidence that both of these effects are stronger for younger and more educated workers (again, only the age interaction in the promotions model is significant). This suggests that the effect of fast track jobs on promotion prospects is not through worker investment in firm-specific capital, as that would decrease the likelihood of exit. It should be noted, however, that firm-specific capital has long been suspected to play a less important role in this financial services firm than it may play in some other firms, since exit continues to occur at a relatively high rate even among employees with a great deal of tenure.

Bonuses and job promotion rates have effects on promotion and exit of comparable magnitude. While the marginal effects are roughly fifty times larger in the model with job promotion rates than with bonuses, the average bonus size (as a percentage of base pay) conditional on receiving a bonus is roughly fifty times the average promotion rate in level 2. If job promotion rates were reported as percentages (i.e. multiplied by one hundred) to scale them the same way as relative bonuses, their marginal effect would be about half the magnitude of bonus's effect and while their mean would be roughly twice the size.

It has already been shown in Table 2 that the impact of fast track jobs on promotion follows a consistent pattern across levels, but the impact on exit is revealed in Table 9 to behave differently. While it is positive and significant in level 1, with a marginal effect on exit rate one-tenth the size of the difference in job promotion rate, it is negative and significant in level 3 with an even larger marginal effect. The impact on exit is positive in levels 2 and 4 but not statistically significant. It is possible that in the first two levels, fast track jobs provide some accelerated learning about the worker that results in either promotion or exit, but by level three this becomes much less important.

The interactions between job promotion rate and age and education are examined non-parametrically in Figures 1 and 2. As the interaction with age is significant, it is not surprising to see a clear pattern in Figure 1. The marginal effect of job promotion rate is nearly 1 (95%) among workers age 25 or younger. It declines sharply until workers reach their forties, beyond which it becomes more erratic but stays low. Figure 2 shows that the impact of job promotion rate appears to be larger for college graduates than for workers with high school only or with some college. The point estimates for those with a masters degree or more are lower, but still above those without a college degree. While far from conclusive, this relationship with education casts some doubt on a hypothesis that fast track jobs are a signal of ability to the external labor market and therefore lower the cost of promotion. Such signals should be more informative for less educated workers.

Recipients of fast track positions and discretionary bonuses differ demographically, as Table 10 shows. Fast track workers are younger, better educated and newer in the firm. One additional year of education increases expected job promotion rate by 0.4%. As shown previously, these younger workers are also those upon whom placement in a fast track job has the greatest effect on promotion. Bonuses are larger for less educated workers, which is fitting since they appear to motivate less educated workers and lead to promotion. Interestingly, bonuses are also larger for younger workers, while their impact on promotion (and possibly exit) was shown to be greater for older ones. This may be incidental: the bonuses have greater impact when they are less expected, and since bonuses tend to be awarded to younger workers, an older one who is surprised by a bonus takes it as a stronger signal.

To conclude the consideration of signaling, Table 11 examines the wage premium associated with promotions relative to within-level raises. It is slightly smaller for fast jobs, but the difference is not significant. From the standpoint of the human capital acquisition model, workers promoted from slow track jobs face a devaluation of their applicable human capital once promoted, which would suggest a smaller promotion raise, but also have just had a positive shock to their perceived innate ability in order to be promoted despite coming from the slow track. The negative effect of bonuses on the promotion premium is unlikely to be driven by threat of exit after signaling to the outside market, since bonuses lower the rate of subsequent exit. Rather, it is likely that some workers exert effort in a manner that is appropriate to reward with higher pay in their present job but does not make them more qualified in the next level. This is not an indication of a relationship between bonuses and base salary because the raises examined here are changes in total compensation, which includes bonuses.

If fast track jobs offer more precise evaluation of a worker's ability, they should lead both to more promotions and to more wage decreases or exits. It has already been shown that in some levels fast track jobs do lead to exit but the effect is not consistent. Table 12 shows that fast track jobs are less likely to lead to real wage decreases. Including observable worker characteristics reduces the effect by half (6% of the difference in job promotion rates instead of 12%) and eliminates the statistical significance. This reduction in wage decreases is not driven directly by promotion, as the sample is restricted to within-level wage changes. Furthermore, Figure 3 reveals that the distribution of within-level wage changes resulting from fast track jobs (the top quartile) is remarkably similar to slow-track jobs (the bottom quartile), but uniformly and slightly higher. The finding that slower jobs are more likely to result in real wage decreases is in fact driven mostly by the second quartile from the bottom. There is no clear evidence of fast track jobs leading to faster learning about ability.

Additional Findings

I now proceed to demonstrate several additional stylized facts concerning fast track jobs. Table 13 shows that fast track positions are higher paying, and this effect is barely reduced at all by the inclusion of other observable predictors of compensation (at a given level, older and less tenured workers are paid more). The impact of a one standard deviation increase in job promotion rate in level 1 would be a 3% higher salary. Unobservable worker heterogeneity appears to dominate the lower intercept in fast-track productivity. If long-term contracts play a role in this firm, any motivation that fast tracks offer for steeper earnings profiles is apparently dominated by a desire to smooth consumption.

Fast track jobs are seen in Table 14 to have higher variance of pay, and once again, this effect is reduced but only slightly by inclusion of observables. Jobs staffed with more educated workers tend to have higher variance of pay. The above is true both for the entire sample and among workers who have just been placed in a new job.

Interestingly, lateral transfers of any sort raise the probability of promotion. Therefore, Table 15 shows that when having been transferred to a slower job is run simultaneously with the job's promotion rate and worker observables, the effect of this lateral transfer is quite pronounced, a marginal effect of close to 6%. If the reason for this lateral transfer were always *because* it is to a slower track job, this would be an illogical result and a clear violation of the theory. However, functional assignment in a real firm is a multi-dimensional problem. Some workers may be transferred between functions precisely because they are marked for promotion and are being given a broader view of the firm, and some of the positions they are rotated into happen to otherwise be slow track jobs. Laterals to a faster job are also significant when run together with job promotion rate and individual characteristics, though with a smaller marginal effect of 4.5%.

What is the persistent effect, if any, of having been in a fast track job once the worker is promoted out of it? While the more valuable human capital from the fast track job remains, the talent threshold for promotion was lower, whereas colleagues who have been promoted from less favorable jobs presumably have great innate ability. Table 16 shows mixed evidence. Among workers who have just been promoted to level 2, a higher job promotion rate in their previous job is a positive and significant predictor of the rate at which they will continue to climb. However, among those just promoted to level 4 the sign is negative and insignificant, and in an overall regression controlling for level the effect is only marginally significant.

In Table 17 we see that promotions from fast track jobs are more likely to be into a different function than promotions from slow track jobs, though the magnitude and significance of this are cut in half when individual observables are included. This is because more educated and less tenured workers are more likely to cross functions.

5. Conclusion

This paper demonstrates that differences in the past rate at which a job has lead to promotion are significant predictors of a number of outcomes. The evidence is consistent with a theory that some positions, referred to as fast track jobs, involve accumulation of human capital which is more valuable at higher level positions than the experience acquired in slow track jobs. This is unlikely to strictly be firm-specific since it can also lead to exit. Promotion from fast track jobs is also unlikely to be less costly to the firm by having already signaled the worker's type, since the effect of fast tracks is at least as strong among more educated workers whose type is better known. Learning about the worker's type appears to operate similarly in fast track and slow track positions since the distribution of wage changes is highly similar. Higher wages in fast track jobs suggest limited importance of long-term contracting.

There are a number of stylized facts presented about fast track jobs.

Stylized Fact 1: Fast track jobs increase the probability of promotion after controlling for worker characteristics or for time at the previous and current levels.

Stylized Fact 2: Fast track jobs also increase the probability of exit, at some levels.

Stylized Fact 3: The effect of fast track jobs on promotion is greater for younger workers.

Stylized Fact 4: Younger, less tenured and more educated workers tend to placed in fast track jobs.

Stylized Fact 5: Fast track jobs are less likely to result in real wage decreases, and the distribution of wage changes they result in is uniformly higher than slow track jobs.

Stylized Fact 6: Neither lateral transfers to a faster job nor to a slower job are rare.

Stylized Fact 7: Fast track jobs are higher paying than others at the same level.

Stylized Fact 8: Fast track jobs have higher variance of pay than others at the same level.

Stylized Fact 9: Lateral transfers increase the probability of promotion, even when to a slower track job.

Stylized Fact 10: Lateral transfers to a faster or slower job are not accompanied by an otherwise unexpected wage change.

Stylized Fact 11: Persistent effects of fast track jobs beyond the immediate promotion are ambiguous.

Stylized Fact 12: Promotions from fast track jobs are more likely to be into a different function.

Since there is a great deal about a worker which the firm observes and the econometrician does not, the effect of being placed in a job cannot be separated from the effect of unobserved worker characteristics. Exogenous forces influencing placement in fast track jobs would be necessary to determine whether the jobs themselves raise the worker's probability of promotion or whether these workers would be promoted anyway.

Appendix A: Proofs

Proof of Proposition 1:

(iv) $\left[d_2 + c_2\theta^e{}_{i3}f\left(\alpha x_s + x_f\right)\right] - \left[d_{1s} + c_1\theta^e{}_{i3}f\left(x_s + x_f\right)\right]$ is clearly increasing in $\theta^e{}_{i3}$ since $c_2 > c_1$. Therefore a value of $\theta^e{}_{i3}$ greater than the point of indifference implies that productivity in Position 2 is higher.

(iii) Similarly, $\left[d_2 + c_2\theta^e{}_{i2}f\left(\alpha x_s + x_f\right) + V_3\left(x_s, x_f + 1; \theta^e{}_{i2}\right)\right] - max\{d_{1s} + c_1\theta^e{}_{i2}f\left(x_s + x_f\right) + V_3\left(x_s + 1, x_f; \theta^e{}_{i2}\right), \quad d_{1f} + c_1\theta^e{}_{i2}f\left(x_s + x_f\right) + V_3\left(x_s, x_f + 1; \theta^e{}_{i2}\right)\}$ is increasing in $\theta^e{}_{i2}$ due to $c_2 > c_1$.

(ii) $\left[d_{1f} + c_1\theta^e{}_{i2}f\left(x_s + x_f\right) + V_3\left(x_s, x_f + 1; \theta^e{}_{i2}\right)\right] - \left[d_{1s} + c_1\theta^e{}_{i2}f\left(x_s + x_f\right) + V_3\left(x_s + 1, x_f; \theta^e{}_{i2}\right)\right]$ is increasing in $\theta^e{}_{i2}$ because x_f is worth more in Position 2 and it is already shown that likelihood of promotion is increasing in $\theta^e{}_{i2}$ (recalling that $\theta^e{}_{i2}$ is predictive of $\theta^e{}_{i3}$).

(i) $\left[d_{1f} + c_1\theta^e{}_{i1}f(0) + V_2(0, 1; \theta^e{}_{i1})\right] - \left[d_{1s} + c_1\theta^e{}_{i1}f(0) + V_2(1, 0; \theta^e{}_{i1})\right]$ is increasing in $\theta^e{}_{i1}$ because x_f is worth more in Position 2 and $\theta^e{}_{i1}$ is predictive of $\theta^e{}_{i2}$ and $\theta^e{}_{i3}$, both of which increase probability of allocation to Position 2.

QED

Proof of Proposition 2:

Consider the mass of workers in the fast track in period one and in period two. Clearly, the number of workers in Position 1f in the first period, relative to the size of a cohort, is $1 - F_1(\theta'{}_1)$. The fraction of a cohort in Position 1f in the second period is

$$(1 - F_1(\theta'_1)) * \left[F_2\left(\theta''_2(0,1)\right) - F_2\left(\theta'_2(0,1)\right)\middle|\theta^e_{i1} > \theta'_1\right] +$$

$$F_1(\theta'_1) * \left[F_2\left(\theta''_2(1,0)\right) - F_2\left(\theta'_2(1,0)\right)\middle|\theta^e_{i1} < \theta'_1\right]$$

which, using Assumption 1, is

$$\leq (1 - F_1(\theta'_1)) * \left[F_2\left(\theta''_2(0,1)\right) - F_2\left(\theta'_2(0,1)\right)\middle|\theta^e_{i1} > \theta'_1\right] + F_1(\theta'_1) * [1 - F_1(\theta'_1)]$$

which using Assumption 2 is

$$\leq (1 - F_1(\theta'_1)) * [1 - F_1(\theta'_1)] + F_1(\theta'_1) * [1 - F_1(\theta'_1)] = 1 - F_1(\theta'_1).$$

Therefore, there are at least as many workers in Position 1f in period one as in period two. Since there are no workers in the fast track in period three, the average age of workers in the fast track is at most 1.5, while the average age of workers in the slow track must be at least 1.5 even if all workers are in Position 2 by the third period.

QED

Appendix B: Measurement Error in Job Promotion Rate

The key right hand side variable in this paper is a constructed measure of the tendency of a job to lead to promotion. There is no direct observation of people marked for rapid advancement or of jobs designed to groom them. Therefore, this quality is observed with noise. The more people have been in a given position and the longer it has been observed the more precisely I can estimate how ‘fast’ it is. Some differences across observed job titles in the rate at which people are promoted out of them is bound to occur even if the actual jobs are identical.

The key question is whether this noise could be correlated with other variables of interest. If not, then the noisy measurement biases estimated coefficients toward zero and the existence of any observed impact is clear evidence of a real impact. In most regressions run in this paper, there is a clear separation between the past and the future. Furthermore, jobs not fitting into any recognized hierarchical level and therefore incapable of leading to observed promotions are excluded from analysis. The rate at which other workers have been promoted from a job in the past predicts future outcomes for the worker. The only way for their success to be correlated with hers is through the job they were both matched with.

The one exception to this temporal separation is the prediction of a worker's promotion premium over the course of her career. Her own raises while she has been in this job lower the difference between her average promotion raise and her average within-level raise. Therefore, noise in the promotion of colleagues in the same job could impact her raises and therefore her promotion premium, biasing the result. If a colleague being promoted out of the job implies a new colleague being moved into it as a replacement and earning less, this could leave more room for a raise and bias the promotion premium downward. However, the point of that regression is that the impact on promotion premium is not significantly negative, and this possible bias does not endanger that conclusion.

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Table 1a

Job Promotion Rate

	N (workers)	N (jobs)	Mean	St. Dev	25^{th} Percentile	Median	75^{th} Percentile
Level 1	16436	84	0.295	0.125	0.175	0.294	0.367
Level 1, 1988	1074	41	0.281	0.110	0.233	0.303	0.363
Level 2	16828	190	0.191	0.114	0.117	0.187	0.263
Level 2, 1988	1234	120	0.171	0.100	0.118	0.171	0.244
Level 3	16178	156	0.126	0.063	0.104	0.119	0.139
Level 3, 1988	1546	98	0.106	0.053	0.084	0.122	0.125
Level 4	13611	55	0.017	0.021	0.010	0.013	0.021
Level 4, 1988	1477	28	0.014	0.008	0.010	0.013	0.016

Table 1b

F-statistic for Job Fixed Effects in Promotion Rate

	F-test	Probability
Within Level 1	F(84, 16351) = 628.05	0.00
Within Level 2	F(190, 16637) = 148.86	0.00
Within Level 3	F(156, 16021) = 94.79	0.00
Within Level 4	F(55, 13555) = 152.80	0.00

Table 1c

Other Summary Statistics

	N	Mean	St. Dev.	Min	Max
Age	73787	39.50	9.86	20	71
Education	62106	15.50	2.43	12	23
Tenure	55402	4.44	3.58	1	19
Female	74071	0.25	-	-	-
Log Total Compensation	36847	10.82	0.41	9.27	13.66
Bonus %	36847	2.70	6.93	0	194
Bonus & if >0	8597	11.58	10.14	0.22	194
Promotion Premium	9062	0.03	0.11	-1.24	0.76

Table 1d

Number of Different Jobs with Observable Past Promotion Rate

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
1970	27	37	19	21	9	2	2
1971	35	48	25	22	8	4	2
1972	28	44	22	21	6	3	1
1973	35	56	25	24	7	4	2
1974	36	53	26	24	9	3	2
1975	36	68	32	29	11	5	2
1976	38	57	33	30	12	6	2
1977	35	61	31	31	18	5	2
1978	36	64	32	32	20	5	2
1979	37	65	35	33	22	4	2
1980	38	67	31	33	22	7	2
1981	40	66	38	32	22	7	2
1982	38	68	38	33	20	7	2
1983	41	73	35	31	19	8	2
1984	40	67	35	29	20	10	2
1985	36	66	32	26	19	13	2
1986	38	78	67	26	19	15	2
1987	40	119	86	29	18	15	2
1988	41	120	98	28	13	16	2

Table 2

Probit Marginal Effects for Promotion

(Errors Clustered by Employee)

	Overall	From Level 1	From Level 2	From Level 3	From Level 4
Job Promotion Rate	23.48% *** (1.76%)	42.27% *** (3.85%)	24.28% *** (3.45%)	10.81% ** (5.16%)	7.56% * (4.21%)
Age	-0.46% ** (0.18%)	-1.59% *** (0.39%)	-0.25% (0.39%)	-0.25% (0.41%)	0.46% ** (0.20%)
Age Squared	-2.51 e-5 (2 e-5)	5.95 e-5 (5 e-5)	-6.74 e-5 (5 e-5)	-3.60 e-5 (5 e-5)	-5.65 e-5** (2 e-5)
Education	1.74% *** (0.63%)	1.07% (1.79%)	0.07% (1.42%)	3.60% *** (1.15%)	0.29% (0.48%)
Education Squared	-0.01% (0.02%)	0.03% (0.06%)	0.04% (0.04%)	-0.06% * (0.03%)	-4.44 e-5 (1.3 e-4)
Tenure	1.80% *** (0.23%)	8.18% *** (0.98%)	2.79% *** (0.54%)	1.74% *** (0.40%)	-0.11% (0.12%)
Tenure Squared	-0.11% *** (0.02%)	-0.78% *** (0.12%)	-0.23% *** (0.04%)	-0.10% *** (0.03%)	9.14 e-5 (7 e-5)
Controls for Gender and Year	Yes	Yes	Yes	Yes	Yes
Controls for Level	Yes	n/a	n/a	n/a	n/a
Pseudo R-squared	0.13	0.07	0.05	0.05	0.05
Observations	40889	12483	11459	9659	6861

* significant at 10%   ** significant at 5%   *** significant at 1%

Table 3

Probit Marginal Effects for Promotion

(Errors Clustered by Employee)

	Without Position Effects	With Position Effects
Time in Previous Level	-0.87% ***	-0.79% ***
	(0.30%)	(0.30%)
Job Promotion Rate	-	11.78% ***
		(2.34%)
Time in Current Level	2.42% ***	2.46% ***
	(0.27%)	(0.26%)
Age	-0.61% ***	-0.51% **
	(0.23%)	(0.23%)
Age Squared	5.08 e-6	-6.03 e-6
	(3 e-5)	(3 e-5)
Education	-0.20%	-0.15%
	(0.71%)	(0.71%)
Education Squared	0.03%	0.03%
	(0.02%)	(0.02%)
Tenure	0.16%	0.25%
	(0.37%)	(0.37%)
Tenure Squared	-0.06% ***	-0.06% ***
	(0.02%)	(0.02%)
Controls for Gender and Year	Yes	Yes
Controls for Level	Yes	Yes
Pseudo R-squared	0.15	0.15
Observations	21274	21274

* significant at 10%   ** significant at 5%   *** significant at 1%

Table 4

Demographic Summary Statistics of Fast and Slow Tracks

	Fast		Slow	
	Mean	**St. Dev**	**Mean**	**St. Dev**
Age	37.84	9.47	41.06	9.72
Education	15.98	2.42	15.08	2.42
Tenure	4.31	3.48	4.42	3.37

Fast defined as at or above 75th percentile of job promotion rate for its level, Slow defined as at or below 25th percentile of job promotion rate for its level.

Table 5

Lateral Transfers between Fast and Slow Track

From Lower to Higher Promote Rate	From Higher to Lower Promote Rate
2310	2431

These represent at least a 50% increase or a 33% decrease

Table 6

Least Squares Regression of Log Raises (within Level) on Accompanying Lateral Transfer

(Errors Clustered by Employee)

	1	2	3	4
Lateral to Fast	0.29% (0.33%)	0.32% (0.31%)	00.14% (0.33%)	0.34% (0.32%)
Lateral to Slow	-0.06% (0.34%)	-0.17% (0.33%)	0.02% (0.34%)	-0.19% (0.33%)
Job Promotion Rate	-	-	2.50% *** (0.80%)	-0.37% (0.76%)
Age	-	-0.64% *** (0.06%)	-	-0.64% *** (0.06%)
Age Squared	-	5.43 e-5*** (6.43 e-6)	-	5.44 e-5*** (6.44 e-6)
Education	-	-0.36% * (0.20%)	-	-0.36% * (0.20%)
Education Squared	-	9.72 e-5 (6.44 e-5)	-	9.70 e-5 (6.44 e-5)
Tenure	-	-0.34% *** (0.06%)	-	-0.34% *** (0.06%)
Tenure Squared	-	8.59 e-5*** (3.3 e-5)	-	8.65 e-5*** (3.3 e-5)
Control for Gender	No	Yes	No	Yes
Controls for Year	Yes	Yes	Yes	Yes
Controls for Level	Yes	Yes	Yes	Yes
Intercept	5.29% *** (0.21%)	25.64% *** (2.12%)	4.56% *** (0.30%)	25.76% *** (2.14%)
Adjusted R-squared	0.04	0.10	0.04	0.10
Observations	17086	17086	17086	17086

* significant at 10%   ** significant at 5%   *** significant at 1%

Table 7

Probit Models of Promotions and Exits on Bonuses

(Errors Clustered by Employee)

Marginal effects (in brackets) from model with level controls rather than job controls

	Promotions		Exits	
Bonus %	0.015*** (0.002) [0.31%]	0.004 (0.014) [0.14%]	-0.005*** (0.002) [-0.10%]	-0.006 (0.017) [-0.15%]
Bonus % x Age	-	7.78 e-4*** (2.34 e-4) [0.02%]	-	-1.69 e-4 (2.22 e-4) [-2.54 e-5]
Bonus % x Edu	-	-0.001 (6.35 e-4) [-0.02%]	-	4.36 e-4 (7.94 e-4) [8.65 e-5]
Age	-0.015 (0.010) [-0.33%]	-0.018* (0.010) [-0.38%]	-0.106*** (0.009) [-2.24%]	-0.106*** (0.009) [-2.24%]
Age Squared	-1.66 e-4 (1.23 e-4) [-3.27 e-5]	-1.52 e-4 (1.22 e-4) [-2.99 e-5]	0.001*** (1.04 e-4) [0.02%]	0.001*** (1.04 e-4) [0.02%]
Education	0.014 (0.038) [0.31%]	0.015 (0.038) [0.35%]	0.104*** (0.037) [2.81%]	0.104*** (0.038) [2.81%]
Education Squared	0.001 (0.001) [0.02%]	0.001 (0.001) [0.02%]	-0.002** (0.001) [-0.07%]	-0.002** (0.001) [-0.07%]
Tenure	0.062*** (0.013) [1.30%]	0.064*** (0.013) [1.34%]	-0.015 (0.011) [-0.63%]	-0.015 (0.011) [-0.64%]
Tenure Squared	-0.004*** (9.17 e-4) [-0.07%]	-0.004*** (9.31 e-4) [-0.08%]	-1.05 e-4 (6.99 e-4) [0.01%]	-7.53 e-5 (6.98 e-4) [1.49 e-4]
Controls for Gender and Year	Yes	Yes	Yes	Yes
Controls for Position	Yes	Yes	Yes	Yes
Pseudo R-squared	0.14	0.14	0.04	0.04
Observations	25304	25304	26829	26829

* significant at 10% ** significant at 5% *** significant at 1%

Indicates prediction of next year's promotion or exit on this year's discretionary bonus.

Table 8

Probit Marginal Effects of Fast Tracks for Promotion and Exit

(Errors Clustered by Employee)

	Promotions		Exits	
Job Promotion Rate	23.48% *** (1.76%)	45.50% *** (12.14%)	5.41% *** (1.63%)	3.66% (9.83%)
Promotion Rate x Age	-	-0.88% *** (0.19%)	-	-0.12% (0.14%)
Promotion Rate x Edu	-	0.51% (0.58%)	-	0.36% (0.48%)
Age	-0.46% ** (0.18%)	-0.12% (0.19%)	-2.07% *** (0.13%)	-2.02% *** (0.15%)
Age Squared	-2.51 e-5 (2 e-5)	-4.22 e-5* (2 e-5)	0.02% *** (2 e-5)	0.02% *** (2 e-5)
Education	1.74% *** (0.63%)	1.55% ** (0.65%)	3.26% *** (0.55%)	3.13% *** (0.58%)
Education Squared	-0.01% (0.02%)	-0.01% (0.02%)	-0.08% *** (0.02%)	-0.08% *** (0.02%)
Tenure	1.80% *** (0.23%)	1.90% *** (0.23%)	-0.84% *** (0.17%)	-0.82% *** (0.17%)
Tenure Squared	-0.11% *** (0.02%)	-0.12% *** (0.02%)	0.03% *** (0.01%)	0.03% ** (0.01%)
Controls for Gender and Year	Yes	Yes	Yes	Yes
Controls for Level	Yes	Yes	Yes	Yes
Pseudo R-squared	0.13	0.13	0.03	0.03
Observations	40889	40889	40980	40980

* significant at 10%   ** significant at 5%   *** significant at 1%

Table 9

Probit Marginal Effects for Exit, by Level

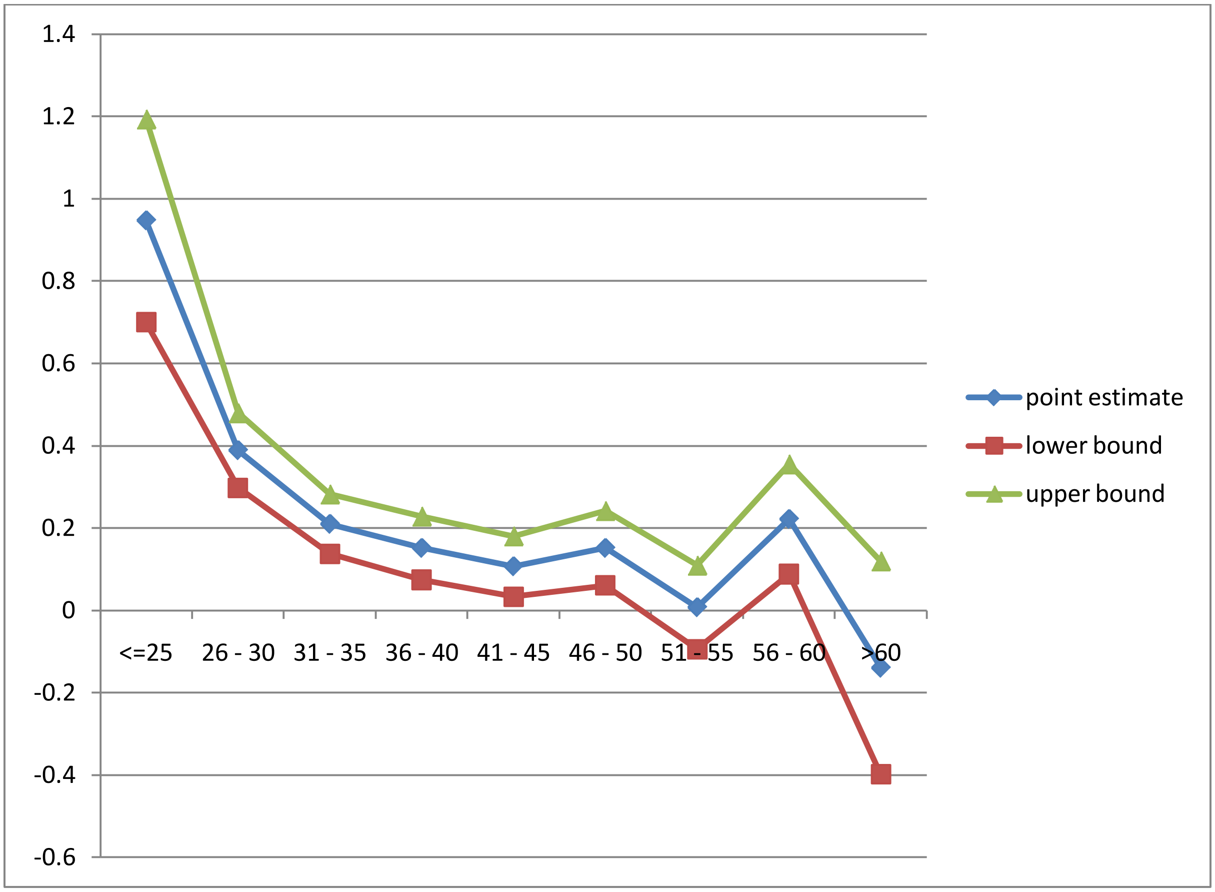
(Errors Clustered by Employee)

	Level 1	**Level 2**	**Level 3**	**Level 4**
Job Promotion Rate	10.21% ***	3.82%	-15.22% ***	10.85%
	(2.30%)	(2.70%)	(5.69%)	(23.32%)
Age	-2.64% ***	-2.28% ***	-0.89% ***	-1.02% **
	(0.22%)	(0.26%)	(0.33%)	(0.40%)
Age Squared	0.03% ***	0.03% ***	9.47 e-5**	0.01% **
	(3 e-5)	(3 e-5)	(4 e-5)	(4 e-5)
Education	0.59%	4.74% ***	3.10% ***	2.47% *
	(1.04%)	(1.12%)	(1.13%)	(1.27%)
Education Squared	0.01%	-0.12% ***	-0.08% **	-0.07% *
	(0.03%)	(0.04%)	(0.04%)	(0.04%)
Tenure	0.55%	-1.03% ***	-1.63% ***	-0.97% ***
	(0.39%)	(0.37%)	(0.31%)	(0.35%)
Tenure Squared	-0.03%	0.05% *	0.07% ***	0.03%
	(0.04%)	(0.03%)	(0.02%)	(0.02%)
Controls for Gender and Year	Yes	Yes	Yes	Yes
Pseudo R-squared	0.05	0.05	0.03	0.02
Observations	12483	11459	9655	6883
Conditional Mean	11.10%	11.62%	10.83%	10.66%

* significant at 10%   ** significant at 5%   *** significant at 1%

Figure 1

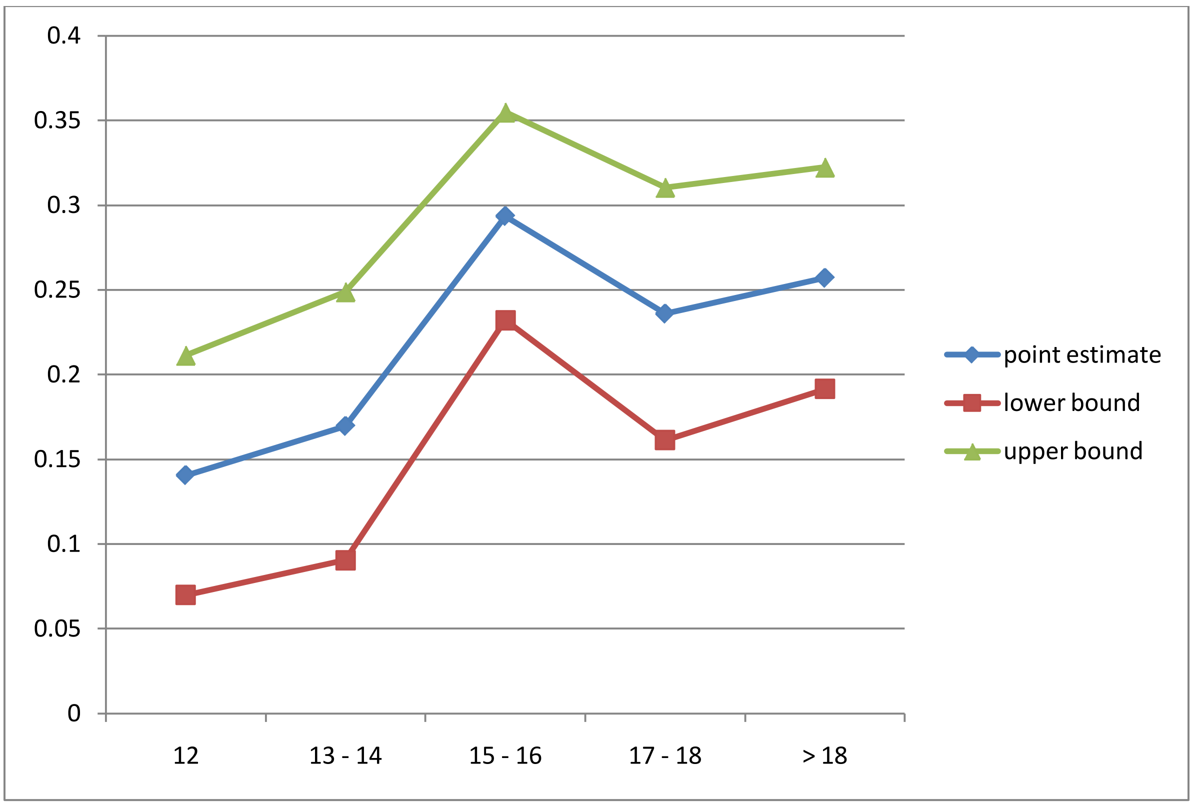
Marginal Effect of Job Promotion Rate on Promotion, by Age Bracket



Includes controls for education, tenure, gender, year and level

Figure 2

Marginal Effect of Job Promotion Rate on Promotion, by Education Bracket



Number of years of education on horizontal axis

Includes controls for age, tenure, gender, year and level

Table 10

Tobit Models of Job Promotion Rate and of Relative Bonus Size

(Errors Clustered by Employee)

	Job Promotion Rate	Bonus %
Age	-0.001***	-0.293***
	(1.01 e-4)	(0.028)
Education	0.004***	-0.379***
	(3.16 e-4)	(0.078)
Tenure	-8.12 e-4***	0.295***
	(2.28 e-4)	(0.060)
Controls for Gender and Year	Yes	Yes
Controls for Level	Yes	Yes
Psuedo R-squared	-0.89	0.05
Observations	44797	29492
Conditional Mean	0.18	2.68
		11.17 if >0

* significant at 10%   ** significant at 5%   *** significant at 1%

Table 11

Least Squares Regression of Log Promotion Premium

(Errors Clustered by Employee)

	1	2	3
Job Promotion Rate	-1.23%	-	-1.35%
	(2.01%)		(1.98%)
Bonus %	-	-0.20% **	-0.20% **
		(0.08%)	(0.08%)
Age	-0.21%	-0.19%	-0.22%
	(0.22%)	(0.20%)	(0.22%)
Age Squared	2.33 e-5	2.01 e-5	2.44 e-5
	(2.68 e-5)	(2.35 e-5)	(2.66 e-5)
Education	-0.14%	-8.20 e-5	-0.08%
	(0.80%)	(0.92%)	(0.79%)
Education Squared	8.48 e-5	4.51 e-5	5.85 e-5
	(0.03%)	(2.98 e-4)	(0.02%)
Tenure	0.76% ***	0.86% ***	0.88% ***
	(0.24%)	(0.24%)	(0.24%)
Tenure Squared	-0.04% **	-0.05% ***	-0.05% ***
	(0.02%)	(0.02%)	(0.02%)
Controls for Gender and Year	Yes	Yes	Yes
Controls for Level	Yes	n/a	Yes
Controls for Position	No	Yes	No
Adjusted R-squared	0.04	0.06	0.05
Observations	6818	6818	6818
Conditional Mean	2.89%	2.89%	2.89%

* significant at 10%   ** significant at 5%   *** significant at 1%

Log Promotion Premium defined as arithmetic mean of all log raises in promotion years over employee's career minus arithmetic mean of all log raises in non-promotion years over employee's career.

Table 12

Probit Marginal Effects on Real Wage Decreases Among with-level Wage Changes

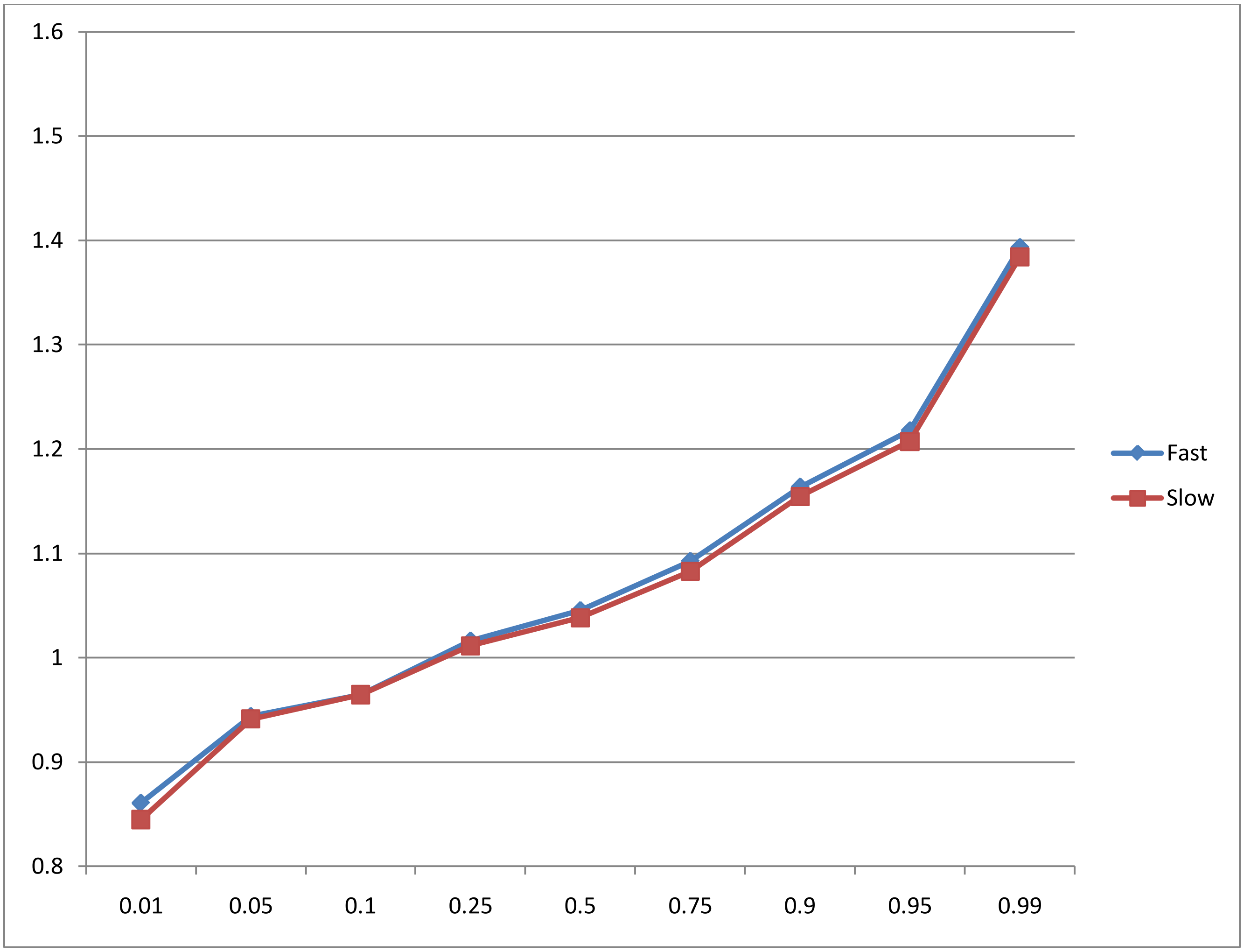
(Errors Clustered by Employee)

	1	2
Job Promotion Rate	-12.16% *** (4.56%)	-5.80% (4.45%)
Age	-	0.55% * (0.31%)
Age Squared	-	-1.91 e-5 (4 e-5)
Education	-	1.41% (1.09%)
Education Squared	-	-0.04% (0.03%)
Tenure	-	1.28% *** (0.34%)
Tenure Squared	-	-0.04% ** (0.02%)
Control for Gender	No	Yes
Controls for Year	Yes	Yes
Controls for Level	Yes	Yes
Pseudo R-squared	0.03	0.05
Observations	17086	17086
Conditional Mean	0.176	0.176

* significant at 10% ** significant at 5% *** significant at 1%

Figure 3

Distribution of Real Wage Changes (within level) Resulting from Fast and Slow Tracks



Percentile of distribution on horizontal axis. Fast defined as at or above 75th percentile of job promotion rate for its level, Slow defined as at or below 25th percentile of job promotion rate for its level.

Table 13

Least Square Regression of Log Compensation

(Errors Clustered by Employee)

	1	2
Job Promotion Rate	0.275***	0.256***
	(0.023)	(0.023)
Age	-	0.025***
		(0.002)
Age Squared	-	-2.77 e-4***
		(2.4 e-5)
Education	-	0.004
		(0.009)
Education Squared	-	3.54 e-4
		(2.68 e-4)
Tenure	-	-0.016***
		(0.002)
Tenure Squared	-	8.14 e-4***
		(1.13 e-4)
Control for Gender	No	Yes
Controls for Year	Yes	Yes
Controls for Level	Yes	Yes
Intercept	10.319***	9.734***
	(0.008)	(0.084)
Adjusted R-squared	0.70	0.73
Observations	28795	28795

* significant at 10%   ** significant at 5%   *** significant at 1%

Table 14

Tobit Models of Standard Deviation of Log Wages within Job

(Errors Clustered by Employee)

	All Workers		First Year in Title	
Job Promotion Rate	0.149*** (0.007)	0.142*** (0.007)	0.119*** (0.009)	0.112*** (0.009)
Age	-	-0.001** (5.19 e-4)	-	2.36 e-4 (6.02 e-4)
Age Squared	-	1.25 e-5** (6.37 e-6)	-	-3.39 e-6 (7.44 e-6)
Education	-	0.005** (0.002)	-	0.006** (0.003)
Education Squared	-	-1.63 e-4** (7.39 e-5)	-	-1.74 e-4* (9.32 e-5)
Tenure	-	-1.72 e-4 (4.72 e-4)	-	-0.004*** (9.71 e-4)
Tenure Squared	-	-3.91 e-5 (2.89 e-5)	-	1.15 e-4* (6.98 e-5)
Control for Gender	No	Yes	No	Yes
Controls for Year	Yes	Yes	Yes	Yes
Controls for Level	Yes	Yes	Yes	Yes
Intercept	0.104*** (0.003)	0.091*** (0.021)	0.133*** (0.004)	0.087*** (0.027)
Pseudo R-squared	-0.13	-0.13	-0.06	-0.07
Observations	29437	29437	9887	9887
Conditional Mean	0.174	0.174	0.163	0.163

* significant at 10%   ** significant at 5%   *** significant at 1%

Table 15

Probit Marginal Effects of Lateral Transfers for Promotion

(Errors Clustered by Employee)

	1	2	3	4
Lateralled to Fast	4.54% *** (1.13%)	6.74% *** (1.12%)	1.80% * (1.06%)	4.46% *** (1.08%)
Lateralled to Slow	3.33% *** (1.15%)	4.50% *** (1.10%)	5.89% *** (1.22%)	5.87% *** (1.15%)
Current Job Promotion Rate	-	-	36.29% *** (1.92%)	22.97% *** (1.78%)
Age	-	-0.68% *** (0.18%)	-	-0.47% *** (0.18%)
Age Squared	-	-6.96 e-7 (2 e-5)	-	-2.32 e-5 (2 e-5)
Education	-	1.70% *** (0.64%)	-	1.66% *** (0.63%)
Education Squared	-	-9.43 e-5 (1.9 e-4)	-	-0.01% (0.02%)
Tenure	-	1.32% *** (0.23%)	-	1.58% *** (0.23%)
Tenure Squared	-	-0.08% *** (0.02%)	-	-0.10% *** (0.02%)
Control for Gender	No	Yes	No	Yes
Controls for Year	Yes	Yes	Yes	Yes
Controls for Level	Yes	Yes	Yes	Yes
Pseudo R-squared	0.09	0.13	0.10	0.13
Observations	40889	40889	40889	40889

* significant at 10%   ** significant at 5%   *** significant at 1%

'Lateralled to Fast' indicates that worker has been moved at some point into current job from a job at the same level with a promotion rate at least 33% lower. Likewise, 'Lateralled to Slow' indicates having been moved into current job from one with a promotion rate 50% higher.

Table 16

Tobit Models of Further Climbing Rate among Newly Promoted

(Errors Clustered by Employee)

	Old Job Only	Overall	New in 2	New in 3	New in 4
Previous Job Promotion Rate	0.048* (0.026)	0.032 (0.026)	0.103** (0.043)	0.058 (0.056)	-0.404 (0.305)
New Job Promotion Rate	-	0.212*** (0.031)	0.152*** (0.047)	0.066 (0.097)	0.149 (0.485)
Age	-0.009** (0.004)	-0.006 (0.004)	0.009 (0.007)	-0.019** (0.010)	-0.062* (0.034)
Age Squared	-1.71 e-5 (5.42 e-5)	-4.12 e-5 (5.42 e-5)	-2.24 e-4** (8.85 e-5)	1.50 e-4 (1.28 e-4)	6.15 e-4 (4.30 e-4)
Education	0.019 (0.013)	0.018 (0.013)	-0.023 (0.022)	0.032 (0.022)	0.060 (0.097)
Education Squared	-1.58 e-4 (4.07 e-4)	-1.56 e-4 (4.07 e-4)	9.91 e-4 (6.74 e-4)	-5.49 e-4 (6.60 e-4)	-0.001 (0.003)
Tenure	0.002 (0.008)	0.005 (0.008)	-0.002 (0.013)	0.015 (0.011)	-0.068*** (0.024)
Tenure Squared	-0.002** (7.84 e-4)	-0.002** (7.88 e-4)	-0.002 (0.001)	-0.003** (0.001)	0.004* (0.002)
Controls for Gender and Year	Yes	Yes	Yes	Yes	Yes
Controls for Level	Yes	Yes	n/a	n/a	n/a
Intercept	0.194 (0.143	0.108 (0.144)	0.045 (0.234)	0.232 (0.273)	0.673 (1.030)
Pseudo R-squared	0.25	0.26	0.12	0.19	0.20
Observations	15232	15232	4678	3319	1784
Conditional Mean	0.166	0.166	0.171	0.092	0.012

* significant at 10% ** significant at 5% *** significant at 1%

Further climbing rate indicates the number of levels an employee will climb beyond her current position (within the sample window), divided by her number of years remaining with the firm within the sample window.

Table 17

Probit Marginal Effects on Cross-function Promotion Given that Promotion Occurs

(Errors Clustered by Employee)

	1	2
Job Promotion Rate	16.79% ***	8.94% *
	(4.46%)	(4.75%)
Age	-	0.12%
		(0.57%)
Age Squared	-	-4.30 e-5
		(7.0 e-5)
Education	-	3.11% *
		(1.87%)
Education Squared	-	-0.09%
		(0.06%)
Tenure	-	-1.74% ***
		(0.63%)
Tenure Squared	-	0.09% *
		(0.05%)
Control for Gender	No	Yes
Controls for Year	Yes	Yes
Controls for Level	Yes	Yes
Pseudo R-squared	0.01	0.02
Observations	7910	7910
Conditional Mean	23.14%	23.14%

* significant at 10%   ** significant at 5%   *** significant at 1%