Internal Labor Market Flows and Wages: Evidence Across the Hierarchy*

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Abstract

This empirical study investigates internal labor (ILM) market dynamics across large enterprises. Uniquely the data includes professional, managerial and executive positions, and has uniform job level and occupation definitions. Some findings are aligned with ILM literature yet others are difficult to reconcile with established theoretical frameworks. First, entry and exit rates are high among professionals and executives but low among managers. Exits are most prevalent in the highest wage deciles. These imply significant non-linearities in ILM outcomes. Second, low bonus payouts lead to exits. This can result from updated future payout expectations. Third, promotions decline sharply along hierarchy and executive positions are mostly filled from outside, suggesting that firm-specific human capital is relatively unimportant in the top hierarchy. Fourth, lateral moves affect wage growth only when combined with promotions. One interpretation is that lateral moves signal employee preferences and ability. In general the findings imply that looking beyond managers to executive ranks is crucial. Top hierarchies seem to be characterised by quite different ILM outcomes than many earlier studies would suggest.

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1 Introduction

Firms engage in multiple activities with their personnel. Employees are hired, and then possibly promoted or laterally transferred. At the end they exit or get fired. While working they accumulate human capital and are rewarded. Firms and employees learn about each other and act upon any new information. Wages seem to deviate from the external market levels, and pricing of labour does not hence adhere to spot market principles. These multiple features constitute an 'internal labor market' (ILM), and they have attracted considerable academic interest. Extensive amount of theoretical literature is devoted to ILM yet empirical research remain relatively scarce.

Many of the empirical ILM regularities were first introduced in Baker et al. [1994]. They analysed how employees entered, advanced, exited and were rewarded in a firm. Conceptually the study emphasised the importance of job levels, firm-specific and generic human capital, and learning. It set the tone for later empirical but also theoretical work. Later studies have broadly supported its findings [Treble et al., 2001; van der Klaauw & da Silva, 2011; Kauhanen & Napari, 2012]. The consistency of findings across contexts is somewhat surprising. Certain key results seem to hold irrespective of country, industry or time period.

Theoretical models typically focus on few facets of ILM. The reason is to preserve tractability. Hence to date there exist no framework which would simultaneously capture hires, promotions and turnover. By integrating job assignment, firm-specific human capital acquisition and learning Gibbons & Waldman [1999] comes quite close. Tournament models such as Lazear & Rosen [1981] view organisations as long-term contests, where employees compete for a limited number of promotion opportunities. These tournaments necessitate convex pay profiles to incentivise effort at all points of hierarchy. Tournament models generate testable hypotheses between wage structures and range of organisational outcomes such as span of control.

Despite the abundance of theoretical work, empirical studies must still look across multiple theoretical models if entries, promotions, lateral moves, turnover and wages are to be investigated. The objective of this paper is to study the internal labor markets of large Finnish enterprises, and where feasible, contrast the findings with theoretical results. The focus is on fundamental ILM outcomes: entries, promotions, lateral moves, exits and wage growth. The paper can also shed light on how employee's expectations of variable pay income affect turnover behaviour. A very tentative test of a key prediction in promotion-as-signal hypothesis [DeVaro & Waldman, 2012] is also conducted. One crucial difference between this and some other empirical studies is that here the data includes

executives. This turns out to be of major importance.

The dataset is rather unique. It is based on Mercer[1] remuneration survey of large Finnish companies. The majority of observations represent large publicly listed companies [PLC]. The data is of high quality, and includes very detailed information of job levels, occupations and compensation elements. It therefore allows for a sophisticated analysis of key ILM outcomes. The data has many attractive features. First, it contains professional, managerial and executive positions. This enables the analysis to cover full corporate hierarchies. As will turn out the inclusion of executives have significant implications on the findings. Second, the data has consistent job level and job family (occupational) classification. Promotions and lateral moves are therefore defined similarly across firms. Third, the data includes 61 companies across different sectors. Firm-specific idiosyncratic factors does not drive the results as is possible in small-N or case studies.

The findings shed light on many ILM outcomes. First, firms have two ports-of-entry, one for junior professionals and another for executives. The canonical ILM narrative thus holds from professionals to senior managers but breaks at executive level. Firm-specific human capital seems to be unimportant at executive level, a clear departure from the findings in Baker et al. [1994]. Second, exits are highest among the top wage deciles. One potential explanation could be the scarcity of promotion opportunities. High-ability employees must seek promotions from competing firms. Third, low incentive compensation leads to exits. This suggest that employees can learn and act upon expectations concerning performance pay. Fourth, promotions are rare among executives and this likely results in their high exit rates. Earlier studies have documented a positive relationship between wages and promotion but the findings here indicate that performance pay is an even better predictor of promotions. Fifth, lateral moves are important from career perspective. They increase promotion opportunities and affect wage growth. Curiously, lateral moves only increase wage growth when associated with a promotion. The interpretation made here is that a lateral move is a signal of both employee preferences and ability. Wage growth upon promotion seems unrelated to education, a contradiction to one of the key predictions in the promotion-as-signal hypothesis. In short, the findings emphasise the importance of looking across corporate hierarchies, not only professionals and managers. The non-linearities do not become visible at managerial level but necessitate the inclusion of executives. Had the executives been omitted from the analysis, the qualitative conclusions would have been rather

[1]Mercer is a wholly owned subsidiary of Marsh & McLennan Companies, Inc. Firms pay for participation in the survey, and receive a market comparison report of their compensation levels.

different.

This paper is organised as follows. Section (2) briefly illustrates related theoretical literature. Section (3) describes the dataset and Section (4) the empirical framework. Section (5) presents the results. Section (6) concludes. Tables and Figures are in the Appendix.

2 Theoretical background

A large body of literature is devoted to the study of internal labor markets. Some studies relevant for the findings in this paper are presented briefly below. They relate to firm-specific human capital [Becker, 1962], tournaments [Lazear & Rosen, 1981] and learning [Gibbons & Waldman, 1999, 2006; DeVaro & Waldman, 2012].

The key idea in Becker [1962] is that employees acquire firm-specific human capital. This accumulation results in worker productivity that exceeds the level possible in competing firms, and a form of bilateral monopoly emerges. The firm can commit to a wage structure where the present value of employment matches outside options but wages still deviate from market levels at certain points of hierarchy. One salient assumption is that firm-specific human capital is important across the hierarchy. This is not obvious. For example, managerial positions might be characterised by high firm-specific human capital intensity but executive ranks would require significant generic human capital. Such situation would render the wage structures more complicated, as the ILM would be exposed to external market not only at entry-level positions but across executives as well.

Tournament models such as Lazear & Rosen [1981] are also based on the idea that firms commit to higher wages along the hierarchy to incentivise effort. Agents compete for a limited number of promotions. To some extent tournaments also depend on the importance of firm-specific human capital. Low firm-specific human capital intensity at executive level could have profound implications on tournaments lower down the organisation because promotion opportunities from within would diminish due to outside entrants. Moreover, if outside hiring of executives were public information among senior managers, the tournament might break down. With few prizes managers would have low incentives to compete for promotions to executive levels.

Learning models are based on either symmetric [Gibbons & Waldman, 2006] or asymmetric [DeVaro & Waldman, 2012] information. In symmetric case worker abilities are public information. Asymmetric models assume that current employer holds private information of worker ability. Since promotions publicise ability, symmetric and asymmetric models yield different wage outcomes.

In asymmetric environment promotions are associated with higher wage growth to compensate for worker's improved reservation wage. This distorts promotion frequencies below first-best level. Gibbons & Waldman [1999] is a theoretical investigation that integrates job assignment, firm-specific human capital acquisition and learning. Its objective is to account for the key empirical regularities in Baker et al. [1994]. Two key findings important here are, first, that wage increases upon promotion are a fraction of the wage difference between hierarchy levels. Second, with reservations the model implies large wage increases upon promotion. Together with other findings the model can capture most if not all empirical regularities in Baker et al. [1994]. DeVaro & Waldman [2012] develop an asymmetric learning model where worker ability is initially private information: in the first period only the incumbent firm observes worker ability. In the second period high-ability workers are promoted. This sends a publicly observable signal of worker ability, and increases employee's reservation wage. The increase is however inversely relative to education level. Lower-educated should experience higher increases since promotions increase their labor market signals more than those of higher-educated.

3 Data

The sample is based on Mercer Total Remuneration Survey data. The sample covers 2011 and 2012, and the data mostly represents white-collar and managerial employees working in Finland. It contains industrial and some service sector firms. Table 1 shows the distribution of employee observations across firms. Approximately 81% of observations represent 12 companies. It should be noted that the firms in the sample have significantly more employees across their foreign units. Some firms have only included certain units or divisions in the data.

The data is rather unique since it contains very detailed job level, occupational and pay information across multiple firms at employee-level. The dataset can alleviate the representation problems inherent in case studies yet still retain consistency of definitions across firms. For example, promotions can be studied using equivalent definitions which is particularly important.

The data is surveyed annually, and it comes directly from firms' personnel databases. The original datasets contain 59437 and 65027 employee observations in 2011 and 2012, respectively. After clean-up the sample sizes reduces to 29952 and 31744. Some of this reduction is caused by firm-level sample attrition since firms with single year of data are removed. Firms with any missing variables are also omitted. Since this study focuses on professional, managerial and executive employees, some blue-collar and manual white-collar observations are excluded.

The significant clean-up is conducted to ensure that the baseline dataset is of the highest possible quality.

One weakness of the data is its short time horizon. Issues necessitating long-run data are obviously impossible. For example, the roles of 'fast track' promotions nor persistent unobserved heterogeneity can not be analysed. Serial correlation in wage increases can not be studied either. Minor data attrition across executive positions is possible as companies might opt to include/exclude them between the two surveys. Although care has been taken to clean the data of any attrition issues, minor upward bias in entry and exit rates can persist.

[Insert Table 1 approximately here]

Job levels used in this dataset are determined by hierarchy level, accountability, management breadth and skill requirements. In the original data they range from 40 ('McJob') to 82 (CEO of the largest company). Job levels in this study are restricted to an interval of 48 to 62 as the focus is on white-collar and managerial employees. The lower-bound represents a typical entry point to an organisation. The upper-bound consist of executives and senior management. The very highest positions (mostly CEOs) are excluded from the data due to low number of observations and potential sample attrition. The importance of having the whole hierarchy is paramount since executives and managers have quite different ILM outcomes. Job levels are aggregated: two original job levels make up one level in this study. In the job classification scheme two original levels constitute a significant change in hierarchy level, accountability, management breadth and/or skill requirements. Two original levels hence provide a solid basis for defining promotions. The aggregation results in 8 total levels. At level 1 to 2 are professionals. Levels 3 to 6 represent senior professionals and middle managers. Executives and senior managers are at levels 7 and 8. Sample statistics are provided in Table 2.

[Insert Table 2 approximately here]

The 3-digit[2] occupational coding identifies around 600 positions. An occupation is a collection of similar tasks and activities (e.g. Production Manager or Network Administrator). Each occupation belongs to a 'job family' (e.g. Production or IT). The classification broadly resembles Standard Occupational Classification (SOC) used in the United States. Job family information is used to analyse lateral transfers.

A subset of 9068 observations contain education data. This represents around a third of the sample. The data reflects employees highest educational

[2]In total the coding is based on 9-digits but only subset is used in this study.

attainment. The levels match UNESCOs International Standard Classification of Education (ISCED). Due to compulsory primary education in Finland, observations with only pre-primary education (level 0) are absent. Hence only six of seven official ISCED levels are present. The lower representation of education data is not critical but makes testing of certain theoretical predictions less robust. Education is omitted from baseline regressions for few reasons. First, the sample consist of professional, managerial and executive employees, where educational variation is relatively insignificant. As shown in Table 3 the majority of employees in these positions have graduate-level university degrees. Second, after controlling for job levels, education is typically left with relatively little explanatory power [see e.g. Treble et al., 2001]. Third, omitting education provides better firm coverage due to missing data. Education data is used to test the promotion-as-signal hypothesis introduced in DeVaro & Waldman [2012]. Yet the hypothesis can only be tested with a limited set of observations. They show both theoretically and empirically that due to signalling wage increase upon promotion is inversely correlated with education. Due to limited education data the results concerning promotion-as-signal hypothesis must here be taken with reservations.

The data also lacks performance ratings. This is quite natural for a cross-firm data, as organisations have different ratings schemes. Performance ratings have been shown to affect promotions and wage growth [DeVaro & Waldman, 2012]. Their absence can therefore result in slight omitted variable bias. It should however be noted that probably part of the variation is captured by performance payouts which are included in the data.

[Insert Table 3 approximately here]

Since the data includes full populations of white-collar and managerial employees in both periods, it allows to identify all key labor flows: hires, promotions, lateral movements and exits among these groups. Hires consist of employees which are present in 2012 but not in 2011 dataset. Exits are the opposite. Yet it should be noted that the type of exit (voluntary or involuntary turnover) remains unknown. Based on external evidence the majority of exits represent voluntary turnover. International transfers within firms can also count as exits which can result in minor measurement error.

Promotions are defined using job levels. A transition between two job levels count as a promotion. This is consistent with the occupational descriptions and the way the job levels are determined. Any promotions hence must imply clear increases in hierarchy level, accountability, management breadth and/or skill requirements. It also aligns with the literature [van der Klaauw & da Silva,

2011; Kauhanen & Napari, 2012]. Importantly, job levels are determined independently of wages, and are therefore not simply pay-grades.

Lateral transfer is defined as a transition between two different job families. For instance, when an employee moves from Production to Supply Chain, a lateral transfer takes place. Given that organisations are increasingly flat [Rajan & Wulf, 2006] and promotion opportunities hence scarce, lateral transfers gain in importance. Amid more limited promotion opportunities talented employees expect to be able to develop their skills by moving horizontally. They are also instrumental in grooming future managers and investing in human capital.[3] Furthermore, the definition adopted here is very convenient since it allows to discriminate between task- and firm-specific human capital. Lateral transfer increases the latter since an employee is exposed to wider array of firm activities or parts of organisation. However, the cost is less (or a lower accumulation of) task-specific human capital at least within an employee's specialty area. This makes possible to assess how changes in these types of human capital affect promotions and wage growth. An ideal definition of lateral transfer would also include transitions between business divisions or countries. Unfortunately the data does not allow for this. Hence the total number of lateral transfers, including moves between countries and divisions, are under-estimated.

In short, the clear advantages of the data are the full-hierarchy coverage, consistent job levels across firms, occupational classification and detailed compensation information. The shortcomings are lack of longitudinal dimension and performance ratings, and a limited coverage of education data. The data allows few previously untested propositions to be studied.

4 Empirical strategy

The empirical estimation is based on OLS and logistic regressions. Wage growth regression is based on OLS. It captures the wage growth between 2011 and 2012. Exit and promotion models on logistic regression. They capture the labor flows occurring between 2011 and 2012.

The wage growth specification takes the form

$$\ln[\Delta w_i] = \eta p_i + \gamma l_i + \mathbf{X}_i\beta + \epsilon_i \tag{1}$$

where Δw_i denotes the wage growth between 2011 and 2012, p_i is promotion and l_i is lateral move. Demographic variables, job levels and controls for job families and firms are in $\mathbf{X}_i$. In one specification lateral move and promotion variables

[3]Lateral moves can have many other reasons. For example, they can be used to terminate poor manager–subordinate matches or escape departmental downsizing.

are interacted. The explanatory variables represent year 2011. The sample used in the wage growth regression includes employees in the data in 2011. Employees hired between 2011 and 2012 are excluded since these observations do not contain data for 2011.

The model specification to estimate the determinants of promotions and exits takes the form

$$Pr[Promotion_{i,2011} = 1] = \gamma l_i + \mathbf{W}_i\eta + \mathbf{X}_i\beta + \epsilon_i \tag{2}$$

and

$$Pr[Exit_{i,2011} = 1] = \mathbf{W}_i\eta + \mathbf{X}_i\beta + \epsilon_i \tag{3}$$

where $\mathbf{W}_i$ includes wages and bonuses, and l_i is lateral move. Demographic variables, job levels and controls for job families and firms are in $\mathbf{X}_i$. In the exit regression job levels are as fixed effects. The rationale is that exits are highly convex with respect to hierarchy, and linear job level variables would obscure this pattern. The sample used in the promotion and exit regressions includes employees in the data in 2011. Employees hired between 2011 and 2012 are excluded since promotions and exits are obviously not obtainable for them.

4.1 Robustness

Four factors can compromise the robustness of the results. They mostly relate to omitted variables. However, none of the factors are critical for the main results.

First, the data lacks span of control and it can contribute to minor omitted variable bias. Its absence has multiple consequences. With high average spans, all else equal the promotion opportunities are lower. Flat organisations should therefore experience higher exit rates. Moreover, larger spans are typically associated with higher manager-worker pay gaps and less complex tasks. The wage growth estimates upon promotion can hence be slightly upward biased in lower task complexity job families where spans are typically higher. It is also notable that flat organisations are typically thought to be more decentralised and employ 'modern' management practices [Caroli & van Reenen, 2001; Bloom & Reenen, 2007]. These can interplay with many HR policies such as promotions and performance management. The omitted span of control variable can therefore introduce noise in coefficient estimates.

Second, due to short sample the estimation does not allow to control for time-invariant individual heterogeneity. Kauhanen & Napari [2012] and Belzil et al. [2012] find that person fixed-effects affect promotion probabilities, for example. In this paper this individual heterogeneity is attributed on other variables.

Third, the lack of education in baseline regressions can affect the results. Given that the sample population represents a highly-skilled part of the workforce, the bias is unlikely to be major. After job levels are controlled, the effect of education is typically modest [see e.g. Treble et al., 2001; Kauhanen & Napari, 2012]. Regressions with limited education data are still provided in this paper.

Fourth, the data does not include employees who entered and left the firms between sample collection dates. In practice this means employees whose tenure lasted less than one year. It is expected that these 'quick quits' represent a really small share of professionals and managers, and hence any error is negligible.

5 Results

5.1 Entry

Hiring patterns reveal how insulated internal labor markets are from the external environment. Starting with Baker et al. [1994] the literature has focused on ports-of-entry, namely hierarchical levels which are most exposed to outside entrants. The key tenet of ILM literature is that there should be a single clear entry point to firm. Typically the port-of-entry is thought to reside on the lower levels of an organisation, from where the workers then start to advance the hierarchical levels. The accumulation of firm-specific human capital creates bilateral utility and a barrier against outside entrants. The canonical ILM framework works well unless there are other entry points. The Finnish case presented here provides evidence of the contrary. Another port-of-entry exists for executives.

An overview of entry patterns are shown in Figures 1 and 2. They show how ILM outcomes vary across job levels and deciles. The average number of entries is relatively high. At 16.5% it is slightly higher than in other studies [Baker et al., 1994; van der Klaauw & da Silva, 2011]. There are three reasons. First, the sample contains white-collar and managerial positions where labor mobility is higher than among blue-collars. Second, it is expected that firms were still hiring in 2011 to compensate the redundancies of the economic downturn of prior years. Third, the relatively high entry rate across Finnish firms is also reported in Kauhanen & Napari [2012]. The high entry rate suggests that the importance of firm-specific human capital is low. Could this reflect the standardisation of corporate processes? For example, as firms implement Enterprise Resource Planning [ERP] applications, the between-firm variation in skill demands should diminish. This could result in lower importance of firm-specific human capital since labor inputs become interchangeable between companies.

This is an important point given that many of the firms in the sample have implemented ERPs. Unfortunately the extent to which technology and process standardisation lessen the importance firm-specific human capital can not studied further here.

[Insert Figures 1 and 2 approximately here]

Hiring in firms are prevalent in lowest and highest job levels. As Table 3 shows, at level 1 and 8 the entry-rates are 26% and 25%, respectively. At approximately 12 to 15%, the middle-hierarchy levels have substantially lower entry-rates. The evidence suggests that firms have two ports-of-entry, one for entry-level professionals and another for executives. This implies that the importance of firm-specific human capital would be highly concave, and attain its maximum in middle-hierarchy levels. Given that executives are frequently hired from outside, generic human capital must be relatively more important in top-hierarchy. Many of the positions in level 8 are members of executive teams or their direct reports in large PLCs. It is possible that in these positions diverse industry or international experience is more important than firm-specific human capital.

Since the finding that executives are significantly hired from outside is somewhat startling, the 12 largest [by sample size] PLCs' executive teams are checked in detail from publicly available governance material.[4] The median tenure in the firm [not in the job] for the CEOs is 6 years, and for other executive team [ET] members 9. Most of the CEOs have hence been hired directly to their current position and only 2 of 12 have stayed at their company for their whole careers. ET members have been hired either to their current roles or one level below. Moreover, a typical organisation hierarchy might have 6 to 10 levels. To advance from the lowest level to CEO positions should hence take at least 20 years. It is immediately evident from the data that only a fraction of the ET members have started in the company as a professional or manager. Most have been hired at senior manager or higher level. This evidence aligns with the main data. It also corroborates the key finding that ILMs have a structural break somewhere between senior manager and executive levels.

The importance of firm-specific human capital should yield ports-of-entry and ports-of-exit. Empirical findings in Baker et al. [1994] and van der Klaauw & da Silva [2011] indicate that outside hiring is prevalent among professionals but very low among top managers. The evidence here is starkly different: hiring for management positions is pervasive. Similar pattern is visible in Treble

[4]The sample of 12 PLCs might not be completely representative but should be sufficient for the sake of argumentation. More evidence of CEO hiring: in 2012 27.1% of SP 500 companies facing a CEO succession hired an outsider for the top job. Source: The Conference Board, http://www.conference-board.org/press/pressdetail.cfm?pressid=4802.

et al. [2001]. They find a convex relationship in entry rates among management, and that the lowest management grade has a higher entry rate than the highest professional grade. Here the lower levels are consistent with port-of-entry: employees are hired, and begin to advance the corporate levels until they reach lower management positions. Yet the management levels of 7 and 8 act as 'second ports'. External hires fill the senior management and executive positions. Studies in the same country and industry context such as Kauhanen & Napari [2012] find that entries are declining along hierarchy. The discrepancy results from different sample populations. Here the data includes much higher management positions.[5]

5.2 Promotion

Since wages in hierarchy are tied to jobs, promotions are an important source of income growth. The commitment by firms to convex wage profiles creates a form of deferred compensation for prospective promotees. However, credible commitment requires that there are few outside entrants to block promotion opportunities. The findings indicate that this is violated at executive levels. There are simply few promotion opportunities from senior manager to executive ranks.

The average number of promotions across levels broadly match the results in other empirical studies. In this sample approximately 8% of employees are promoted each year. Yet reflecting pyramidal organisation hierarchies promotions decline along job levels. There are simply less positions at higher levels of hierarchy. However, entries from outside also crowd-out promotion opportunities at management levels. Figures in Table 3 illustrate this: at level 7 only 2% were promoted to a higher level. Yet at level 8 25% were hired from outside. These figures imply that management positions are mostly filled from outside. As stated above, these findings contrast with Baker et al. [1994] who find very few outside entrants to management positions. Given that listed companies executive teams' work histories are disclosed (e.g. in annual reports), the fact that the upper echelons of corporate management are best reached from outside is more or less public information. It is interesting to speculate what kind of behaviour such information would incentivise. Clearly there would be few tournaments at the executive level. Maximisation of generic human capital even at the cost of firm-specific could make sense at the senior management level.

[Insert Table (3) approximately here]

[5]Hourly wage here in level 8 is log 4.3, while in Kauhanen & Napari [2012] level 1 (the highest) has approximately log 3.2.

Promotions across Finnish enterprises are significantly predicted by wage. As shown in Table 2 the relative pay position within level is monotonously associated with a higher probability of promotion. This suggests that job performance and skills drive career mobility extensively. This finding aligns with empirical literature [Baker et al., 1994; Kauhanen & Napari, 2012]. It is also consistent with theoretical results in Gibbons & Waldman [1999].

Regressions confirm the descriptive results. The signs of wages and job levels in Table 4 are consistent across specifications with firm and job family fixed effects. Yet the regressions reveal other interesting findings.

First, bonuses which are based on job performance in the previous year (2010) predict promotion. This suggests that job performance has a very significant effect on promotion. In fact bonuses predict promotions even better than wages. The ratio between wage and bonus coefficient (3.6) is much lower than the ratio between wages and bonuses (15.15) implying that performance pay has more than four-fold effect on promotion probability.

Second, as in Belzil et al. [2012] lateral moves increase the probability of promotion. Employees who switch their job families are therefore more likely to move up the hierarchy. This suggests that firm-specific or actually organisational human capital – exposure to or willingness to learn a wider set of firm activities in this respect – is more important than task-specific human capital. This finding would be consistent with the idea that at higher levels consolidation of tasks becomes relatively more important. Hence experience from multiple firm activities is valuable. This result is not driven by job family coding. As a robustness check a job family called General Management was omitted, and the results were unchanged.[6] Since the timing of promotions and lateral moves are unknown within the year, it is clear that half of promotions precede lateral moves. Moreover, the average period should be too short to result in significant human capital accumulation. It should be noted that since both promotions and lateral moves here take place within the same year the whole effect is unlikely to stem from better firm-specific human capital. Rather, it probably results also from signalling and selection effects: more able employees move more both laterally and vertically. Therefore the estimate for the effect of lateral moves on promotions should be treated definitely as an upper-bound. Yet it provides at least tentative empirical evidence of the distinct returns of different types of firm-specific human capital. Furthermore, below it will be shown that lateral moves affect wage growth positively, which further reinforces the idea that organisational human capital could be an important part of firm-specific human

[6]The finding therefore can not result from job families changing to General Management which would create a mechanistic association between promotions and lateral moves. Secondly, the vast majority of promotions take place in lower levels with very few General Management positions.

capital.

[Insert Table (4) approximately here]

Regression with education produces an expected result. As shown in Table 4 education increases promotion probability significantly. The marginal effect at mean is around 0.8 percentage points. For example, at approximately 8% the annual promotion probability with a bachelor's degree is close to average across the population. With a master's degree the probability is 8.8%. The empirical evidence here thus corroborates with the theoretical model developed in Gibbons & Waldman [2006]; DeVaro & Waldman [2012]. The rationale in these papers for the positive association is that higher-educated accumulate human capital faster. A positive association between promotions and education was also found in [Kauhanen & Napari, 2012].

5.3 Exit

Exits mirror the image of entries. This is a logical result from the fact that in the absence of major layoffs or expansions the shape of firm hierarchies should be broadly fixed between consecutive years. Workers who are early in their careers experience substantial turnover. Approximately 17% of level 1 employees turnover but the rate declines significantly across levels 2 to 5. It is unlikely that lack of promotion opportunities at level 1 would cause high turnover since they are in abundance at that level. One interpretation is that poor matches are dismantled quickly during early careers to minimise losses on lifetime earnings.

Executives experience especially high turnover. This evidence contrasts with other studies which do not find evidence of port-of-exits [Baker et al., 1994; Kauhanen & Napari, 2012]. The probable explanation is the lack of promotion opportunities across management positions. Simply stated, in many firms the promotion opportunities might not just exist for most executives: they have already reached the apex of their functional organisation. Many support function (IT, HR and legal etc) executives are very unlikely to be promoted to CEO positions. To advance careers they are hence forced to seek career opportunities in outside firms.

As Table 2 shows, exits are significantly concentrated on top two deciles. This is consistent with findings in [Treble et al., 2001; Kauhanen & Napari, 2012]. Some of this turnover probably results from lack of promotion opportunities especially in the higher job levels. High-ability individuals then seek opportunities outside their own firms. It would be interesting to see what effects spans of control would have on these results. If spans of control are high, the promotion opportunities are low since many workers chase few managerial

positions. It would therefore be interesting to analyse whether high-ability exits are particularly prevalent in flat organisations with high spans of control. Given how intertwined organisation hierarchies and ILM flows can be it is unfortunate that such analysis is not feasible here. Another explanation for the high exit rates among the top wage deciles could be that employees understand the value of generic human capital as it is valued on executive levels. High-ability employees therefore seek exposure to different firms, industries and even countries to maximise their possibilities to reach management positions.

[Insert Table (5) approximately here]

These descriptive results concerning exits are confirmed by regressions displayed in Table 5. The regressions show one additional interesting finding. Although higher wages are associated with more turnover, bonuses have the opposite effect. It is important to note that this finding is robust to job family and firm fixed effects. Hence it is not caused by high variable pay firms which could also have adopted other advanced HR practices to engage and retain their workforces [Bloom & Reenen, 2007]. Two interpretations are possible. First, since bonuses are typically paid in Spring, employees with low payouts might leave in Winter after learning that incentives fail to yield any payouts. Since exact exits dates are unobserved, this can not be completely verified. Second interpretation is based on employee expectations. Individual-level incentive payouts for those employed in 2011 and 2012 are serially correlated at 0.72. The correlation is robust to job level and firm fixed effects, and hence does not reflect different incentive plans across companies. Employee's incentive payout in year $t-1$ therefore predicts payout in t. It is probable that low actual incentive payout in $t-1$ results in turnover since employees update their beliefs about year t incentive payouts. It is also true that employees learn about firm's actual performance during year t, and therefore the beliefs are unlikely to only reflect serial correlation in payouts.[7] Employees with high pay-out expectations stay, and those with low expectations exit resulting in the observed pattern. It is difficult to come up with plausible alternative explanations.

5.4 Wage growth

Wage growth between consecutive years is positively related to career advancement. This is logical since wages are positively correlated with job levels. As Table 6 shows, both promotions and lateral moves are associated with higher

[7] Many corporations have company- or division-level profitability triggers in incentive plans which can zero all pay-outs irrespective of employees' individual performance. Poor company-level performance in the first-half of year can significantly reduce the expected value of incentive if the possibility of high second-half performance is low.

wage growth irrespective of model specification. In Model 4 with firm and job family fixed effects promotions increase wage growth by 3.3 percentage points. Since average wage growth across all observations is 4.3%, the relative increase is very significant. This reflects the fact that the key to wage growth is through promotions. Yet the wage increase due to promotion is lower than the difference in average wages between consecutive job levels. The mean wage difference between job levels is 18.6%. This implies that promotees move down in pay distribution within their respective job levels. As shown in Table 2, promotes are predominantly from the upper deciles of pay distribution. Within the new job level promotees occupy a lower portion of the distribution.

These results are consistent with theoretical [Gibbons & Waldman, 1999] and empirical [Baker et al., 1994; Dohmen et al., 2004; Kauhanen & Napari, 2012] findings. The estimates here are slightly lower than in some other studies. In Kauhanen & Napari [2012] promotions increase wages by 4%, and in Baker et al. [1994] by 5.8%. Compared to the latter, the gap results from the differences in Finnish and U.S. wage structures. The wage-job level relationship is more convex in U.S. implying that promotion premia must also be higher. Variations in promotion definitions can also yield differences in estimates.

Lateral moves seem to increase wage growth. The effect is small but statistically significant at 0.01 level. Employees who change their sphere of activity earn an increase of 0.3%. Yet as Model 5 in Table 6 shows, the source of wage growth is not the lateral move itself but one associated with a promotion. The interaction of promotion and lateral move is highly significant but it leaves the isolated effect of a lateral move close to zero.

[Insert Table (6) approximately here]

One interpretation for the positive interaction coefficient could be learning and retention. Namely, an inclination from an employee to move laterally implies a willingness to work in new environment or within different tasks: opportunities which are typically found in competing firms. This signals employee's preferences to firm, and exposes it to a retention risk. Moreover, an inclination to move laterally could also signal of employee's latent ability, previously unobserved by the firm. The logic for this ability signal is that lateral moves necessitate more generic human capital since tasks and/or environment changes.

These signals trigger firm to not only give new tasks/environment but to promote as well. The lateral move is due to the preference signal, promotion due to higher revealed ability or generic human capital.[8] The general logic behind ability and higher managerial status is explained in number of theoretical

[8]Lateral moves typically trigger a separate process within HR to assess employee's ability and suitability for different tasks.

studies [Rosen, 1982; Gibbons & Waldman, 1999]. The pay premium associated with such career move would hence reflect the firm learning of employee's high ability, and the threat that competing firms impose. It would explain why the pay premium from lateral move and promotion exceeds the premium from a pure promotion.

This interpretation hinges on few assumptions. First, firms learn from and sort employees at the time they signal their willingness to move laterally. Employees whose ability signal have not strengthened clearly are laterally moved but receive an insignificant increase in wage amid the transfer. Second, firm's information of employee ability must be imperfect. If the information was perfect, a willingness to move laterally would not yield learning of higher ability. Third, lateral movers should come evenly from the wage distribution given their job level, an empirical finding documented in Table 2. If they came exclusively from the top deciles, the case for positive ability signal were weak since there would be little firm-side learning involved. Fourth, the moves should be employee-initiated. Unfortunately it is impossible to differentiate between firm- and employee-initiated moves in the data. The interpretation seems plausible but should be tested in other empirical settings.

Another explanation for lateral moves is matching [Jovanovic, 1979]. Firms would re-match employees with poor previous matches by moving them to different jobs. The findings here do not support this view since wages do not increase upon lateral move within job level. If lateral moves were used to remedy poor matches, the movers should come from lower deciles of wage distribution. Moreover, as shown above lateral moves are positively associated with promotions. It is hence unlikely that lateral moves would be used for re-matching purposes.

There is some evidence in the literature that firms use lateral moves to learn from employee abilities [Eriksson & Ortega, 2006]. With reservations the evidence here supports the learning view. Yet is should be noted that in this interpretation the employee's willingness to move is critical since it should lower the employee's cost to switch firm. The learning-retention threat mechanism suggested here therefore relies on the idea that willingness to laterally move reveals information about employee's preferences and ability.

The promotion-as-signal hypothesis developed in DeVaro & Waldman [2012] provides an interesting theoretical prediction. Wage growth upon promotion should be inversely correlated with education. The logic is that the marginal improvement in ability signal due to promotion is lower the higher the level of education. The authors find such relationship in their data. However, as shown in Table 6 the regressions here do not support this hypothesis. When promotion and education are interacted in the wage growth regression, the coefficients are insignificant. This is consistent with a symmetric learning model [Gibbons &

Waldman, 2006].

Lower educated therefore do not experience higher wage growth upon promotion as the theory would suggest. It should be noted that as only a third of observations contains education, this result should be taken with reservations.

6 Conclusions

The results presented here depart from the canonical ILM findings. Large corporations are characterised by two entry and exit ports, the second residing on the executive level. Exits are also prevalent among the highest wage deciles. Promotions play a key role in ILM but the findings here imply a structural breaking point above managers. They decline sharply along hierarchy and executive positions are mostly filled from outside, suggesting that firm-specific human capital is relatively unimportant in the top hierarchy. It seems that firms are characterised by two qualitatively different internal labor markets. One stretching from professionals to senior managers, another for the executives. External evidence from 12 PLCs give this claim further credibility. These findings are hard to reconcile within current theoretical frameworks.

Employees seem to formulate expectations of future variable pay earnings. Low expectations predict turnover. As documented in other studies [Dohmen et al., 2004; Belzil et al., 2012], lateral moves are an important source of career and pay growth. Here only the combination of a lateral move and promotion increases wage. One interpretation which should be taken with caution is that an employee's inclination to move laterally is signal of unobserved ability and subsequent learning by the firm. The results corroborate the positive association between education and promotion developed in DeVaro & Waldman [2012]. However, the model's prediction that wage growth is inversely correlated with education upon promotion does not get support from the data.

The findings have implications for theoretical work. First, the models should account for the convexity in the importance of generic human capital. The extent of outside hiring at executive levels imply that firm-specific human capital is of limited value at higher levels of hierarchy. This is troubling for tournament models since the incentive structure for managers would break down should the top positions be mostly available for outside entrants. Second, given that exits are high among the top wage deciles, the interplay between promotion opportunities and shape of organisation hierarchy could be substantial. Theoretical models which analyse exit patterns together with hierarchical variables (e.g. span of control) could be useful.

Few lessons for firms are notable. First, higher wages are unlikely to increase retention among high-ability individuals. Performance pay provide more

retention per euros spent. Second, it seems that firm-specific human capital is relatively unimportant among Finnish corporations [Kauhanen & Napari, 2012]. Standardised processes such as ERPs might erode the intensity of firm-specific human capital even further. Third, firm policies which enable lateral moves could yield information gains of employee abilities. To the extent these allow for better matches between jobs and abilities, rents should accrue for both parties.

How well do these results generalise would be interesting to know. Many findings here certainly align with existing empirical literature yet some seem novel. Whether these reflect Finnish idiosyncrasies or not, remains open.

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A Tables and figures

Table 1: Firm statistics

Empl. obs.	*Firms*	*Empl. obs.*	*Empl. obs. %*
<100	36	1174	4.4%
101-500	19	3919	14.8%
501-1000	4	2619	9.9%
1001-2000	3	3491	13.2%
>2000	5	15255	57.7%

The sample includes all employees who are present in 2011 and 2012. Employees who exit or enter between 2011 and 2012 are therefore omitted.

Table 2: Entries, promotions, lateral moves and exits by wage decile

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Entry	0.150	0.149	0.149	0.141	0.171	0.192	0.184	0.166	0.165	0.185
Promotion	0.025	0.034	0.057	0.065	0.071	0.076	0.104	0.129	0.144	0.155
Lateral move	0.105	0.100	0.075	0.087	0.074	0.097	0.086	0.095	0.106	0.102
Exit	0.108	0.106	0.100	0.099	0.121	0.112	0.115	0.127	0.143	0.172

Notes: The figures represent the share of employees experiencing a given ILM outcome within the wage decile.

Table 3: Descriptive statistics by job level

Level	*N*	*Log wage*	*Wage variation*	*Education level*	*Entry*	*Promotion*	*Lateral move*	*Exit*
1	3952	10.6	0.16	4.02	0.26	0.11	0.09	0.17
2	7047	10.7	0.16	4.52	0.16	0.11	0.09	0.11
3	6143	10.8	0.16	4.67	0.14	0.05	0.08	0.11
4	4831	11.0	0.17	4.66	0.12	0.06	0.08	0.12
5	2287	11.2	0.19	4.86	0.14	0.04	0.12	0.13
6	1027	11.4	0.19	4.98	0.13	0.02	0.09	0.16
7	402	11.5	0.19	4.87	0.18	0.02	0.12	0.18
8	204	11.7	0.21	4.73	0.25	0.00	0.09	0.35

Notes: the sample sizes and wages are based on 2011 data. Figures represent means at a given level. The 2012 has slightly more observations. The data is based on 61 companies across sectors. Wage variation is the relative standard deviation within job level. Education is based on 9068 observations in the 2012 data. Entries, promotions, lateral moves and exits represent the share of employees experiencing a given ILM outcome within the job level.

Table 4: Promotion regression

	Dep. var. promotion within firm			
Variable	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Wage (1000)	0.049***	0.057***	0.058***	0***
	(0.003)	(0.003)	(0.003)	(0)
Bonus (1000)	0.03***	0.016**	0.016**	0
	(0.004)	(0.005)	(0.005)	(0.417)
Lateral move	1.057***	0.778***	0.807***	0.629***
	(0.069)	(0.078)	(0.08)	(0)
Male	0.35***	-0.024	0.008	0.204.
	(0.066)	(0.072)	(0.078)	(0.084)
Job ladder	-0.41***	-0.413***	-0.417***	-0.439***
	(0.016)	(0.019)	(0.019)	(0)
Age	-0.054***	-0.047***	-0.047***	-0.046***
	(0.005)	(0.005)	(0.005)	(0)
Tenure	0.011*	0.01*	0.011*	0.015.
	(0.004)	(0.005)	(0.005)	(0.054)
Education level				0.254***
				(0)
Fixed effects				
Firm	No	Yes	Yes	Yes
Job family	No	No	Yes	Yes
N	22501	22501	22501	9038

Notes: *** significant at .1%, ** at 1%, * at 5% and . at 10%. All models are estimated using logistic regression. The sample includes all employees who are present in 2011 and 2012. Employees who exit or enter between 2011 and 2012 are therefore omitted.

Table 5: Exit regression

	Dep. var. exit from firm		
Variable	*Model 1*	*Model 2*	*Model 3*
Job level 2	-0.477***	-0.541***	-0.523***
	(0.062)	(0.065)	(0.065)
Job level 3	-0.541***	-0.576***	-0.576***
	(0.069)	(0.073)	(0.074)
Job level 4	-0.626***	-0.637***	-0.643***
	(0.08)	(0.085)	(0.085)
Job level 5	-0.611***	-0.74***	-0.757***
	(0.106)	(0.113)	(0.113)
Job level 6	-0.339*	-0.441**	-0.456**
	(0.136)	(0.145)	(0.145)
Job level 7	-0.112	-0.318	-0.312
	(0.189)	(0.2)	(0.2)
Job level 8	0.381.	0.212	0.241
	(0.222)	(0.235)	(0.235)
Wage (1000)	0.007***	0.004.	0.004.
	(0.002)	(0.002)	(0.002)
Bonus (1000)	-0.019***	-0.01*	-0.01*
	(0.004)	(0.004)	(0.004)
Male	-0.395***	-0.343***	-0.315***
	(0.045)	(0.048)	(0.051)
Age	0.008*	0.007*	0.007*
	(0.003)	(0.003)	(0.003)
Tenure	-0.011***	-0.013***	-0.013***
	(0.003)	(0.003)	(0.003)
Fixed effects			
Firm	No	Yes	Yes
Job family	No	No	Yes
N	25617	25617	25617

Notes: *** significant at .1%, ** at 1%, * at 5% and . at 10%. All models are estimated using logistic regression. The sample includes all employees who are present in 2011. Employees who enter between 2011 and 2012 are therefore omitted.

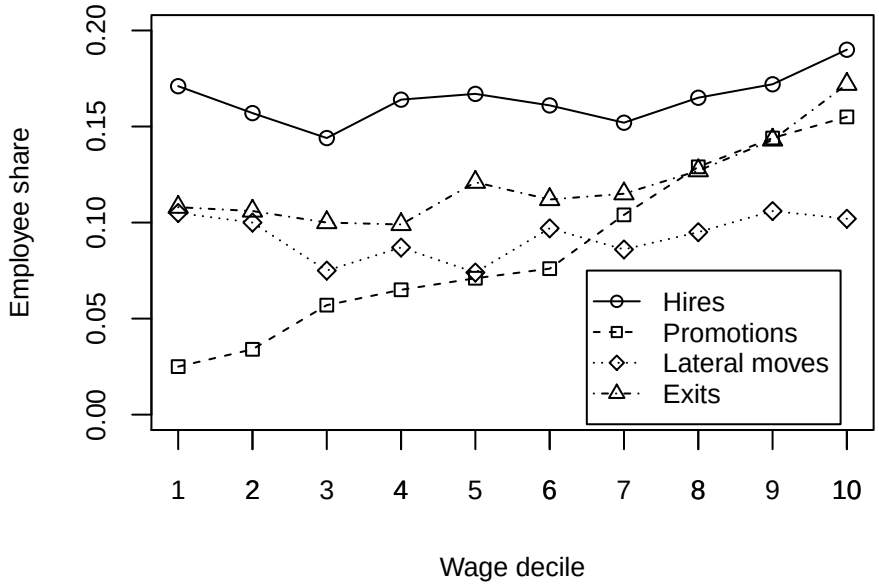

Figure 1: Internal labor market flows by wage deciles. The figures indicate the share of employees experiencing ILM flows across wage deciles between 2011 and 2012.

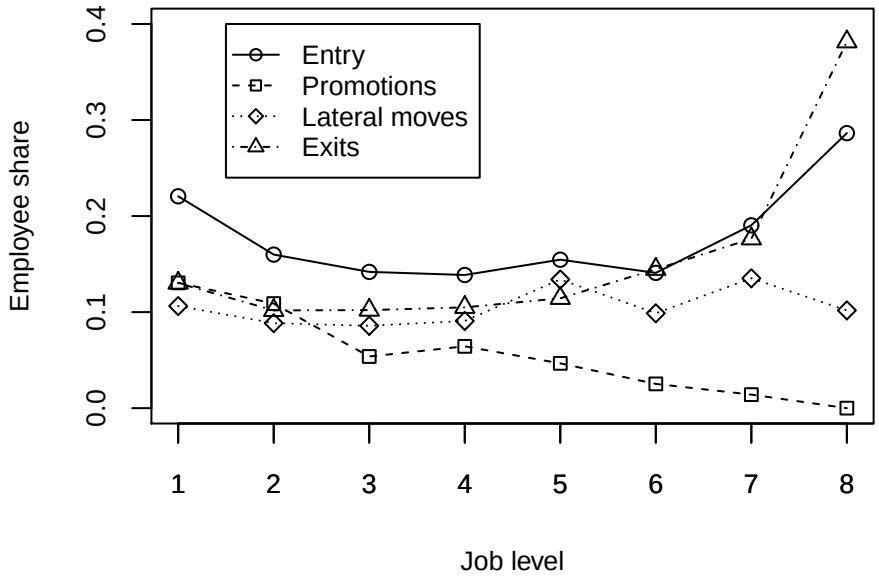

Figure 2: Internal labor market flows by job levels. The figures indicate the share of employees flowing from/to a job level between 2011 and 2012.

Table 6: Wage growth regression

	Dep. var. difference in annual log-wage					
Variable	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
Job level	0	0	-0.0002.	0	0	0
	(0.0001)	(0.0001)	(0.0001).	(0.0001)	(0.0001)	(0.9264)
Male	-0.006***	-0.0021*	-0.0017.	-0.0021*	-0.0021*	-0.0069***
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0)
Age	-0.0007***	-0.001***	-0.001***	-0.001***	-0.001***	-0.0007***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0)
Tenure	-0.0002**	0	0	0	0	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.2038)
Promotion	0.0154***	0.0328***		0.0325***	0.0301***	0.0106
	(0.0014)	(0.0014)		(0.0014)	(0.0015)	(0.3905)
Lateral move	-0.0004		0.006***	0.0034**	0.0011	
	(0.0013)		(0.0013)	(0.0013)	(0.0014)	
Prom*lat move					0.0131***	
					(0.0033)	
Education level						-0.0003
						(0.6907)
Educ*promo						0.0025
						(0.347)
Fixed effects						
Firm	No	Yes	Yes	Yes	Yes	Yes
Job family	No	Yes	Yes	Yes	Yes	Yes
R^2	0.03	0.15	0.13	0.15	0.15	0.04
N	22503	22503	22503	22503	22503	9068

Notes: *** significant at .1%, ** at 1%, * at 5% and . at 10%. All models are estimated using OLS.