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CAREERS AND WAGES IN THE DUTCH EAST INDIA COMPANY

by

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Abstract

In the sixteenth and seventeenth centuries, inter-continental trade brought with it a novel form of organizing business: the multinational firm. Headquartered in Europe and operating in Asia, the success of the East India Companies depended largely on the management of overseas outposts, as well as their labor force. Using a dataset of 115 workers hired in Europe to work in Asia, I present the internal structure of civil servants careers and wages in the Dutch East India Company in the eighteenth century. This early modern firm mimics well current theories of internal labor markets: there are stable career paths, fast tracks in promotions, and sizable returns to tenure.

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1 Introduction

In the sixteenth and seventeenth centuries, the establishment of European merchant empires in the East brought with it a novel form of organizing business: the multinational firm. Headquartered in Europe, the East India companies operated all around the Indian Ocean stretching outposts from the East Coast of Africa to Japan and the South-Asian Archipelago (today's Indonesia), with vast presence in India.

These companies controlled the eastern trade with Europe, mostly in spices, but also in other Asian products highly valued in Europe, such as porcelain and tea. The companies reached trade agreements with Asian sovereigns for the sale and storage of the merchandise in local warehouses so that it was ready for loading when the ships arrived for the next European-bound voyage.

The success of the companies depended largely on their management of trade and the overseas personnel conducting it, either on land at geographically dispersed trade outposts, or at sea. The trade outposts employed local labor for activities such as loading ships, but also European workers for positions of trust or skill (e.g. constable or bookkeeper). The latter were the actual *in-loco* managers of these far flung trading empires. Their pay accounted for the jobs' distant location, often affected by military conflict and ravaged by disease, which workers would reach if they managed to survive the original voyage. Moreover, these workers handled high value goods in distant locations, so their trustworthiness was a matter of major concern to the company's owners. On the one hand, workers' loyalty to the company could be enhanced through higher pay and/or beyond wage compensation.[1] On the other, the company could set up non-compensation mechanisms, such as career progress, that made the worker choose to be honest.

In this paper I present evidence on the internal structure of careers and wages of civil servants in the Dutch East India Company (*Vereenigde Oost-Indische Compagnie*, VOC). The data covers the entire histories of 115 VOC civil servants who spent some time of their

[1] For a discussion of compensation structures in merchant empires see Rei (2012).

careers in the Bengal branch office during the eighteenth century. There is information on worker's wage, occupation, promotion, location, as well as the corresponding dates.

The data show that careers in the VOC appear to have had stable paths and fast tracks. The vast majority of workers in the sample became civil servants, even though some initially joined the sea or military rankings of the VOC. However, workers entering the company in the civil sector progressed faster in the company's hierarchy. There are also sizable returns to tenure. The estimation yields a 5% return per year, which is higher than previous estimations (Abraham and Farber 1987, Altonji and Shakotko 1987, Topel 1991, Altonji and Williams 1997). This high value on the returns to tenure can be resulting from omitted variable bias given the limitations of the small and old dataset, for example, worker education is not observed. On the other hand, the relatively high returns relative to current studies, can also reflect the specificities of these careers, attained on a single firm in somewhat dangerous occupations.

The three hundred year old data avoids the confidentiality issues plaguing the current personnel economics literature, which is quite scarce in empirical studies particularly those regarding career progress.[2] In this paper, the nature of the firm is very clear as are the roles of the workers in it. Despite its age, the VOC mimics well the theories of internal labor markets in today's corporate world.[3]

2 The VOC: History and Organization

Chartered by the Dutch States-General in 1602, the Dutch East India Company merged six previous merchant companies that had been sending fleets to the East since 1595. The early companies of Amsterdam, Delft, Hoorn, Middelburg, Rotterdam, and Zeeland, had varying degrees of success but ultimately competed with each other raising the price of spices in Asia. The Dutch objective was however, to displace Portugal's empire in the East, and assume

[2]See Baker, Gibbs, Holmstrom (1994) for a detailed study of careers in an unidentified large firm over twenty years.

[3]For a review of the literature see Gibbons and Waldman (1999).

control of the trade of Asian products in Europe.[4] As a result the States-General intervened and encouraged the foundation of the unified company.

The charter conferred the VOC with rights of trade, diplomacy and conquest in the vast area to the east of the Cape of Good Hope and to the west of the Strait of Magellan. Only the VOC, and no one else in the United Provinces, had exclusive rights to create and impose laws; establish forts, factories and settlements; implement an exclusive monopoly of trade; wage war against foreign powers; and impose capital punishment on individuals under its jurisdiction (Ward, 2009:9-10).[5]

The administration of the vast Dutch empire stemmed from the company's headquarters in Amsterdam, which were organized in six chambers resembling the earlier merchant companies, all of which were represented in the central management. The VOC's board of directors was composed by seventeen members (the *Heeren XVII*), nominated by each chamber according to its participation in the company's capital stock: eight from Amsterdam, four from Zeeland, one from Hoorn, one from Rotterdam, one from Middelburg, and one rotating director chosen among the smaller chambers (Glamann 1981). Each chamber executed the administrative decisions of the board of directors, which, among many other tasks, involved fitting ships, hiring personnel, and ordering and storing merchandise.

In Asia, all VOC operations were centralized in Batavia, the seat of the *High Government* composed by a governor-general, a director-general (in charge of trade), and an advising body by the name *Council of the Indies* (*Raad van Indie*). The governor-general reported directly to the board of directors in Amsterdam in an annual general report (*generale missive*) on the company's business, which also provided detailed information about the state of the branch offices in Asia. Beyond the annual report, the governor-general would also send to Amsterdam the *general call from the Indies* (*generale eis*) in which he would inform the

[4]Portugal's dynastic crisis in 1580 resulted in the transfer of the crown to Philip II, the king of Spain. Consequently, Portugal became an enemy of the United Provinces of Northern Netherlands, which declared independence from Spain in 1581.

[5]The granting of such wide privileges was by no means typical of the VOC. All European merchant companies of the time conducted trade, administered justice and had their own armies, becoming therefore states within a state.

board of directors of the company's needs of money, commodities, ships, men as well as the maintenance of orders from Europe (Gaastra 2007:24). Each branch office had a similar governing body to that of the *High Government* and reported directly to the governor-general in Batavia in similar fashion as the correspondence between Batavia and Amsterdam.

The VOC gradually established branch offices in Asia, starting with the spice abundant South-Asian Archipelago. The Dutch successfully fought and displaced the Portuguese from South East Asia and Japan, relegating them to a few outposts on India's western coast. As trade developed, the company expanded further into the Far-East, India, as well as western locations in the Indian Ocean such as the entrance of the Red Sea. The main objective was to control local trade routes and get access to Indian textiles and other products that would be traded for spices in South East Asia. Moreover, the VOC wished to block the Levant routes and eliminate the long-standing, if minor, competition by the Italian city states. By the middle of the seventeenth century the VOC had branch offices in Ceylon, the Banda Archipelago, Formosa, Ternate, Amboina, Coromandel, Malacca, Cape of Good Hope, Java, Makassar, Bengal, Surat, Persia, Malabar, Padang (Sumatra), Banjarmasin, Palembang, Japan, and Timor.

The volume of trade soared throughout the seventeenth century, also known as the Dutch Golden Age. The first decades of the eighteenth century also witnessed a significant increase in shipping to and from Asia, but the turning point came around 1730 when the English East India Company was more organized and started competing more aggressively.[6] The financial decline of the VOC became apparent by 1780 when it turned to the States-General for a loan, which allowed to keep the company in business at the advent of the fourth Anglo-Dutch war. The VOC's difficulties were aggravated by the collapse of the First Dutch Republic in 1795 and the official demise came with the expiration of the charter on December 31st, 1800. The nationalization of the company's territorial possessions resulted in the Dutch East Indies colony.

[6] For a detailed summary of the VOC's shipping see Gaastra (2007, p. 115).

3 The Personnel Data

The multi-variate nature of the VOC's operations merged merchant interests, military ventures and oceanic transportation. Consequently, the company recruited a variety of people with different skills among merchants, soldiers and sailors, while also encouraging settlers to move to the distant locations of the empire. Throughout the entire lifespan of the company (1602-1800), the VOC recruited almost one million workers, a number that does not account for the indigenous or slave populations, the high morbidity on ships and land, or the labor hired in Asia for local activities (Ward 2009:34).

Though forced and bonded migration did exist in the Dutch empire, in this paper I concentrate solely on voluntary migration, that is, labor hired for pay in Europe to work in Asia. More specifically, I concentrate on the careers of civil servants, leaving out of the analysis workers that were hired to and made there careers in the military and sea sectors.

The data were gathered from a thorough historical study of the VOC personnel by Frank Lequin in 1982. Among the wide range of information concerning the administration of the VOC in the East, Lequin provides the complete career records of 115 VOC workers who belonged to the Bengal branch office (though they could have spent part of their careers elsewhere) in the eighteenth century. All but seven workers in the sample were hired in the home country. The seven workers born in Asia had European first and last names and belonged to Amsterdam's chamber, so I assume they were descendants of VOC workers rather than locally hired labor. Careers span from 1669, sixty-seven years after the establishment of the VOC, to 1799, a year before the formal dissolution of the company. Consequently, the career patterns presented here are likely a good approximation of workers' expectations when offered an overseas job at the VOC.

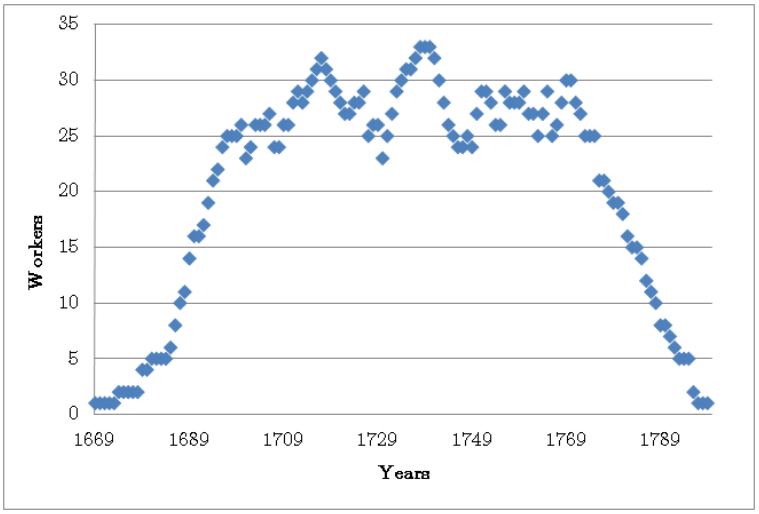
Although small, the dataset has detailed information on each worker. Each observation contains the worker's name, place of birth, VOC chamber of origin, age upon entry (when known), date of entry, civil status (when known), job location and corresponding date, occupation and corresponding date, monthly wage by occupation, career payments to the

family in the Netherlands, career payments above wage, time spent in Bengal, date and motive of exit, whether a testament was left in the event the worker died in service, and the date of the last payment to the family in the Netherlands.

Variables for location and monthly wage are not available for all years, but just recorded when a worker changed location or occupation. I assume each worker has the same occupation (and corresponding wage) and remains on the same location for intermediate years.

Figure 1 shows that for about ninety years (1690 to 1780) the number of workers in the sample is somewhat stable. Not surprisingly, in the first twenty five years of the data the number of workers is increasing, which can but does not necessarily indicate company growth. Rather, this is a direct effect of Lequin's selection process: workers in the sample belonged to the Bengal's branch office in the eighteenth century, therefore some of them started their careers in the seventeenth. The sharp decline in the last twenty years of the data, does reflect the dissolution of the company in 1800.

Figure 1: VOC Workers in a Given Year



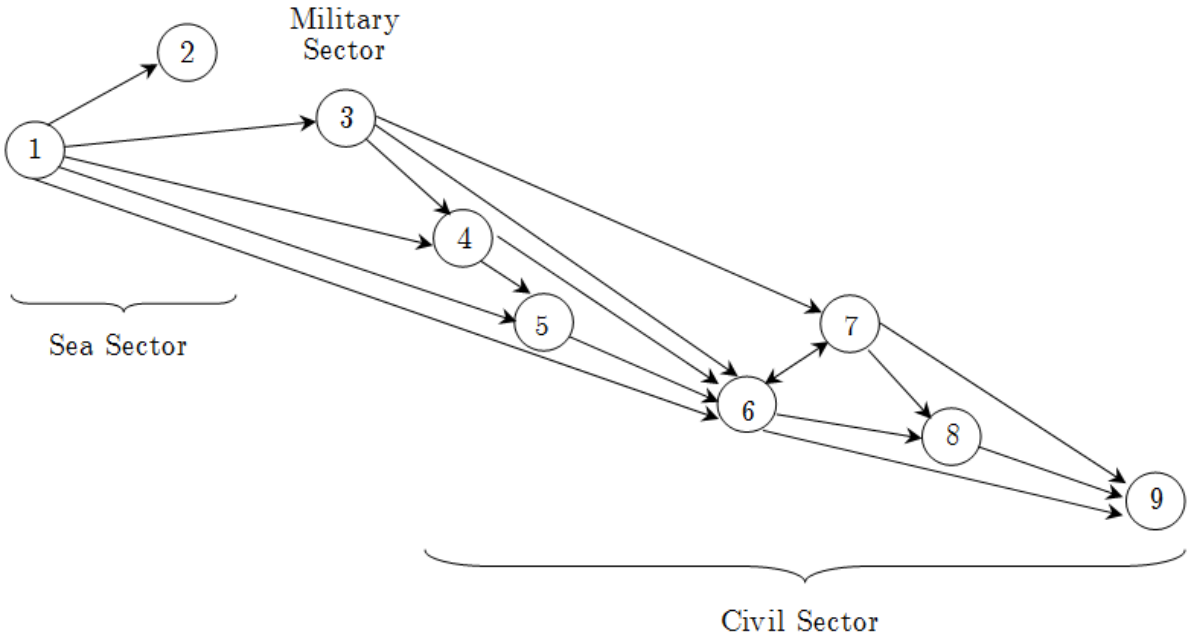
4 Careers: Hierarchy, Entry, and Exit

Table 1A in the Appendix shows the complete list of occupations of the 115 workers and their corresponding wages. There are fifty-one occupations divided in three sectors of activity:

civil, military, and sea. On par with these three, Lequin also lists an artillery sector and a surgery sector, with one and two occupations respectively. Since there were only three workers in these sectors, I merged the artillery sector with the military sector and the surgery sector with the sea sector. In this sample, both ship's surgeons transfer to the civil sector, which was not a general tendency.[7]

Lequin provides a hierarchical structure of six occupational levels within the civil sector (labeled 4 to 9 in Figure 2), but provides no such distinction within the sea or military sectors. In order to denote some progression in the sea sector I additionally divided it into two levels according to skill (a *boy* in a ship is certainly less skilled than the ship's *captain*). Figure 2 shows a total of nine levels based on the career paths of the 115 workers of the sample.

Figure 2: Hierarchical Levels in the VOC



The civil service path in the VOC was quite straightforward. Workers would join the VOC either in the lower sea sector (level 1), the military sector (level 3), or any of the lower levels of the civil sector (levels 4 to 6), but almost all moved into the civil sector over the

[7]For further on the careers of ship's surgeons see Bruijn (2009).

course of their careers. The only exceptions are three seamen who remain so until the end of their careers in level 2. The remaining workers all end their careers in the civil sector, though 42 entered the company in different sectors.

The transition matrix on Table 1 shows five entry levels in the VOC: 26 workers entered in level 1 to low-skilled occupations such as *Sailor* and *Midshipman*; 16 workers entered in level 3, the military sector; and 73 workers entered in three entry levels of the civil sector, 20 in level 4 to occupations such as *Junior Assistant*, 49 in level 6 as *Junior Merchants*, and 4 in level 7 as *Merchants*. There is a clean upward career progress, except for two demotions down to level 6 from level 7.[8] Levels 2 and 9 are career ends: level 2 in the sea sector with occupations ranging from *Steersman* to *Captain*, and level 9 in the civil sector with occupations such as *Director* or *Governor General*.

Table 1: Workers' Transition Between Levels

From/To	Entry	1	2	3	4	5	6	7	8	9	Exit
1	26	0	3	1	19	1	2	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	3
3	16	0	0	0	13	0	3	1	0	0	0
4	20	0	0	0	0	26	26	0	0	0	0
5	0	0	0	0	0	0	25	0	0	0	2
6	49	0	0	0	0	0	0	63	3	2	38
7	4	0	0	0	0	0	2	0	32	3	31
8	0	0	0	0	0	0	0	0	0	16	20
9	0	0	0	0	0	0	0	0	0	0	21
Total	115	0	3	1	32	27	58	64	36	21	115

Movement between the sea and military sectors is minimal, with only one transition from the lower sea sector to the military sector (from level 1 to 3) and no transitions in the other direction. From the observed pattern, one may be led to believe that the sea and military sectors were just launching pads to the civil sector. However, given the nature of operations of the VOC, the company certainly needed experienced soldiers and sailors. Those not being

[8] I analyze these two cases in the next section.

prevalent workers is yet more evidence that this is a sample of civil servants.

The exit pattern by level on the last column of Table 1 shows 72 workers exiting the VOC as merchants (level 7) or higher and only 21 of those reached the top level of the civil sector. Since these were civil servants in a trading company, it seems strange that 37% of them (43 workers) left the company before reaching the position of *Merchant*, exiting at level 6 or less. This tendency begs an inquiry about the exit motives of workers, which show in Table 2.

Table 2: Workers' Exit Motives

	Workers	%
Arrival to the Netherlands	15	13
Death	53	46
Departure from the East	20	17
Fired	1	1
Retired	1	1
Unknown	25	22
Total	115	100

Workers leaving the sample due to retirement, departure from the East, or arrival in the Netherlands completed their contracts.[9] Of the remaining workers, 22% left the VOC for unknown motives and 47% have incomplete career paths due to contract termination or death (46%). The latter confirms the knowledge that many of these distant locations were continuously struck by disease and often subject to military conflict. Such high morbidity raises issues on the accuracy of the last column on Table 1: since at least 46% workers have their careers truncated the observed exit pattern does not necessarily serve as an indicator of ability.

Table 3 shows the death pattern according to the levels at which workers exit the sample. Similar to the exit pattern, the number of deaths decreases as we move up the civil service hierarchy. However, the percentage of deaths among those who exit the sample does not exhibit that same monotonic pattern and stays generally high. This being the case, it seems

[9]The distinction between the last two categories is minimal and mainly related to company's records: some workers are registered as arriving back in the Netherlands after serving in the East, while others are just recorded as having departed from the East on company's return ships. In either case, these workers concluded their time of service in the VOC and returned to Europe.

reasonable to conclude that, in this sample, death occurred at random across all levels, even if it was the most common motive for leaving the VOC.

Table 3: Exit levels and Death

Level	Percentage of workers exiting (#)	Percentage of deaths among workers who exit (#)
2	3 (3)	0 (0)
5	2 (2)	0 (0)
6	33 (38)	50 (19)
7	27 (31)	42 (13)
8	17 (20)	60 (12)
9	18 (21)	43 (9)

There are no exits from the sample in the military sector (level 3) and no seamen die on the job (levels 1 and 2), so all deaths occur among civil servants. Since most workers in the sample transfer to the civil service it is worth to investigate whether death affected career length and whether the latter was associated with a worker's starting sector.

Table 4: Dependent Variable – Career Length (OLS)

	(1)	(2)	(3)	(4)
Civil	-7.707***			
Military		4.793		7.155**
Sea			7.282**	8.773***
Death	3.072	-1.453	-1.284	-1.324
Civil*Death	-5.285			
Military*Death		9.431		9.302
Sea*Death			2.126	2.166
_Cons	27.384***	22.011***	21.141***	19.650***
N	115	115	115	115
R^2	.2169	.0739	.1005	.2053

Significance: *10%, **5%, ***1%.

Despite the death pattern showed in tables 2 and 3, Table 4 shows that death is not a significant variable associated with shorter careers in any single or joint sector specification. A worker's starting sector however, seems to yield significant results on career length. Workers starting their careers in the civil sector had shorter careers by 7.7 years on average, a

pattern that does not seem to have been associated with death (column 1). Starting in the military sector does not seem to have any significant impact on career length if this is the only sector to be controlled for in the regression (column 2). Only sixteen workers joined the VOC as soldiers, which leads to large standard errors and an imprecise estimation of positive sign. However, once all starting sectors are controlled for, original soldiers and sailors averaged longer careers by 7.1 and 8.7 years, respectively (column 4). Whether this pattern was relevant for promotions and earnings is the subject of the following two sections.

5 Promotion Patterns

I now turn to the workers' progress in the VOC's civil service. Is it the case that those who entered the company in a given sector or higher in the hierarchy had faster careers? Or, on the contrary, did workers starting at lower levels have a better chance of reaching the top?

The time span covered by the data (1669-1799) represents a large portion of the company's history. The observed career patterns in this sample, however small, are therefore good approximations of a worker's expectations upon the offer of an overseas job at the VOC. Table 5 shows the waiting time for promotion to any given level since entry.

Table 5: Waiting Time for Promotion (years)

From − To	Workers	Mean	St. Dev.	Min.	Max.
n − n+1	115	5.9	3.51	1	17
Entry − 2	3	9.0	6.1	5	16
Entry − 3	1	1.0	0.0	1	1
Entry − 4	30	4.7	3.4	1	14
Entry − 5	26	9.2	4.3	1	21
Entry − 6	54	10.3	6.5	1	21
Entry − 7	63	13.8	7.7	1	34
Entry − 8	35	18.0	8.3	2	32
Entry − 9	21	21.0	9.4	5	39

Each worker waited on average 5.9 years to be promoted to the next level. The long waiting time to get from the lowest to the highest level of the sea sector –9 years on average–

is due to the large number of occupations (job titles) in each level of the sea sector (8 in each).[10] The short waiting time for promotion into the military sector (level 3), is misleading as it refers to a single worker that transfers from the sea to the military sector. The difference between waiting time from entry up to level 5 and from entry up to level 6 is just one year, possibly indicating that level 5 was just a transitional trial-level before getting to the position of *Junior Merchant* (level 6). Waiting time for promotion from entry up to the various levels of the civil sector intuitively increases in level, but does the waiting time for promotion up to any level vary with the sector of entry?

Table 6 shows the waiting time for promotion to the lower, middle, or top of the civil sector (levels 4, 7 and 9 respectively), given the worker's sector of entry into the VOC. Workers who started in the civil sector progressed faster to the top than workers starting as military or seamen, the latter exhibiting the slowest progress.

Table 6: Waiting Time for Promotion by Entry Sector (years)

Entry − To	Workers	Mean	St. Dev.	Min.	Max.
sea (1) − 4	17	5.8	2.2	2	10
sea (1) − 7	12	20.4	9.4	2	34
sea (1) − 9	3	30.0	10.8	18	39
military (3) − 4	13	3.8	4.2	0	14
military (3) − 7	11	17.3	6.0	5	30
military (3) − 9	3	29.7	3.2	26	32
civil (4) − 7	44	10.0	5.4	0	21
civil (4) − 9	15	17.5	7.8	5	33

Original seamen would take double the time to get to be merchants (level 7), when compared to new entrants in level 4, the lowest of the civil sector (20.4 vs 10 years). Similarly, to get to the top of the hierarchy (level 9), the original seaman would have to wait 30 years, compared to 17.5 for civil sector entrants. Also, five times as many workers reached the occupation of *Director* (level 9) if they started in the civil sector, than in any of the other

[10] The sea sector could be devided in more levels, according to the wage progression of the civil sector. Given however the small dataset and also that only three workers start and finish their careers in the sea sector, two levels suffice to denote career progress.

two starting sectors. The same pattern, though not magnitude, is true for the occupation of *Merchant* (level 7). Since the vast majority of workers in the sample transferred to the civil sector, entry into sea sector implied a slower career path since the waiting time to reach the lowest level of the civil sector was two years longer than that of the military sector (5.8 vs 3.8 years). Starting in these two sectors implied longer, but also slower careers.

Progression within the civil sector shows in Table 7. The lowest waiting time for promotion occurs from level 5 to level 6 with 4.3 years. This tendency seems to reinforce the argument that level 5, with the occupations of *Bookkeeper* and *Provisional Junior Merchant*, may have been transitional since workers would spend at least one year less in it than in any other level in the civil sector. There were twenty-six workers to skip level 5 altogether, moving directly from level 4 to level 6 and only having to wait slightly longer (4.5 vs 4.3 years); of these, fifteen workers joined the company in the civil sector. On the other hand, of the twenty-five workers that moved from level 4 to level 5, only four joined the company in the civil sector. Level 5 seems therefore to have been a level that would mainly prepare workers for the civil sector career if they lacked experience in the field. As such level 5 slowed the civil servant's career.

Table 7: Waiting Time for Promotion in the Civil Sector

From − To	Promotions	Mean	St. Dev.	Min.	Max.
4 − 5	25	5.6	3.7	0	18
4 − 6*	26	4.5	2.8	0	10
5 − 6	24	4.3	2.5	0	9
6 − 7	62	8.6	4.8	-13	17
7 − 8	32	5.7	3.9	0	15
8 − 9	16	5.4	2.6	1	10

*Direct promotion, not through level 5

Junior Merchants (level 6) faced the longest waiting time for promotion, 8.6 years, exactly double of the previous level. It is also into level 6 (and from level 7) that the two demotions in the sample occur. One of the demotions implied wage loss: from *Merchant* earning 60 florins a month, to *Solicitor* earning 50 after two years. The other demotion appears to have meant

just a title change, from *Merchant* to *Provisional Merchant*, but the wage kept constant at 50 florins a month even after 13 years. This last case may be a data entry mistake from the source, given that the earnings of a merchant do not correspond to the wage schedule in the appendix, moreover this same worker is promoted to senior merchant later in his career.

After level 6 the waiting time for promotion decreased, especially for the top executive level. The personnel policy of the VOC seems to have made it harder to reach the occupation of *Merchant* (level 7), after which workers progressed faster to the top. But did workers who wait less for the first promotion, have faster careers?

Since this is a sample of civil servants, I now investigate if there is a correlation between the time for promotion to a given level in the civil sector (4 to 8) and the waiting time for promotion from entry to upper levels.

Table 8: Correlations

	Entry − 4	Entry − 5	Entry − 6	Entry − 7	Entry − 8
4 − 5	-.3204				
4 − 6	.1083				
4 − 7	.3345				
4 − 8	.1815				
4 − 9	.4633				
5 − 6		.1023			
5 − 7		.6049			
5 − 8		.5607			
5 − 9		.9397			
6 − 7			-.2385		
6 − 8			-.1942		
6 − 9			-.0346		
7 − 8				-.0536	
7 − 9				.1395	
8 − 9					.1619

Table 8 shows correlations that are generally positive showing that a fast track existed: the shorter the overall time from entry into any stage of the civil sector, the shorter the waiting time for promotion from that stage to upper levels.

There are a few notable exceptions. All correlations of the waiting time for level 6 with promotions to higher levels are negative, but the correlation size decreases at higher levels.

Level 6 corresponds to the occupation of *Junior Merchant*, likely a trial for that of *Merchant*, in which case it slowed down career progress. The highest negative correlation occurs between the occupations of *Assistant* and *Bookkeeper* (levels 4 and 5), verifying yet again that level 5 slowed down careers. A similar argument can be made for the positions of *Merchant* and *Senior Merchant* (levels 7 and 8) but the negative correlation here is much smaller.

6 Career Returns

With the career and promotion patterns well defined, I now investigate the returns to tenure in the VOC. Did workers with slower but longer careers earn more throughout their tenure than workers who progressed faster through the company's internal ladder but had shorter careers? To answer this question it is necessary to understand the firm's compensation structure.

Merchant empires typically had two forms of labor compensation: a wage, according to occupation; and an above wage income, which could take the form of trade privileges, gifts and payments from local jurisdictions or financial advantages associated with a given position. In the Dutch empire the wage share of total compensation was roughly 64% leaving a non-negligible component to above wage income (Rei 2012).

Table 9 shows the potential effects of career length, death and starting sector on total career earnings.[11] As with career lengths, death remains largely insignificant for the determination of career earnings. Longer careers seem to have influenced career earnings positively as expected. Starting sectors also yield significant results with workers original civil servants benefiting relative to sailors and soldiers. Even though the latter have longer careers on average, as Table 4 shows, once career length is accounted for starting in the military or sea sectors has a negative impact on earnings.[12]

[11] Similar results yield for wage and above wage income. Signs and significance remain unchanged but magnitude differs a little.

[12] Cross products between carer length and starting sector are statistically insignificant.

Table 9: Total Career Earnings (OLS)

	(1)	(2)	(3)	(4)
Career length	0.059***	0.051***	0.053***	0.059***
Civil	0.500***			
Military		-0.360**		-0.551***
Sea			-0.400***	-0.532***
Death	0.133	0.135	0.153	0.107
_Cons	8.127***	8.655***	8.638***	8.633***
N	115	115	115	115
R^2	0.5809	0.5207	0.5406	0.5907

Dependent variable: log (total compensation); Significance: *10%, **5%, ***1%.

Unfortunately, data on non-wage compensation is only available in career totals, but the detailed monthly wage data allow the computing of the wage earnings profile in the VOC. Since there is information on each worker's entire wage history I can estimate the returns to tenure including individual fixed effects and therefore controlling for unobserved selection or ability biases.

Table 10: Returns to Experience (FE)

Fixed-effects (within) regression				Number of obs =		2673
Group variable (i): id				Number of groups =		115
R-sq: within = 0.7528				Obs per group: min =		5
between = 0.0396				avg =		23.2
overall = 0.4737				max=		52
F(4,2554) = 1944.30				Prob > F =		0.0000
corr(u_i, Xb) = -0.2008						
log(wage)	Coef.	Std. Err.	T	P > |t|	[95% conf.	interval]
experience	.0501385	.001853	27.06	0.000	.046505	.053772
experience^2	-.0001455	.0000467	-3.12	0.002	-.000237	.000054
military sector	.2918011	.0493493	5.91	0.000	.1950325	.3885698
civil sector	.7943426	.0328874	24.15	0.000	.7298539	.8588314
_cons	4.893767	.0282579	173.18	0.000	4.838356	4.949178
sigma_u | .40711054						
sigma_e | .28448186						
rho | .6719087 (fraction of variance due to u_i)						

Table 10 shows estimated returns of approximately 0.05 per year, which is on the high end of the range of estimates in modern datasets (Farber 1999). The different nature of the VOC and the difficult conditions of these overseas jobs probably have no equivalent in modern

firms and could justify the higher returns to tenure. Relative to the sea sector (omitted from the regression), workers in the military and civil sectors had statistically significant higher earnings even after accounting for experience. In sum, having longer careers did not translate into higher life-time earnings.

7 Conclusion

This paper focuses on the personnel policies of one of the first ever multinational firms, the VOC. In particular, I investigate the company's career structure using a dataset of 115 workers hired in the Netherlands to serve in the company's offices overseas.

According to the data, workers starting as sailors or soldiers had longer careers, even though their progress through the company's internal ladder was slower and their earnings lower than workers staring as civil servants. Careers in the VOC appear to have had stable paths, fast tracks in promotions, and sizable returns to tenure. These findings are consistent with the empirical implications of recently proposed models of the internal labor market of firms.

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Table 1A: Occupations with corresponding wages and levels of the 115 workers

Occupation	Wage	Level
Ship's boy	5	
Runner	7	
Junior sailor	8	
Sailor	10	
Midshipman	10	1
Shooter at sea	12	
Quartermaster	14	
Junior steersman	26	
Junior surgeon [(a)]	14	
Senior surgeon [(a)]	24	
Steersman	32	
Senior steersman and equipment master	40	
Senior steersman	48	
Skipper	65	2
Captain-Lieutenant at sea and eq. master	70	
Skipper and equipment master	80	
Captain at sea and eq. master	80	
Captain at sea	80	
Soldier	9	
Drummer	10	
Corporal	14	
Garrison scribe	16	3
Sergeant	20	
Ensign	40	
Constable [(b)]	14	
Junior assistant	16	4
Assistant	24	
Bookkeeper	30	5
Provisional junior merchant	30	
Junior merchant	40	
Solicitor	50	6
Provisional merchant	50	
Merchant	60	7
Senior merchant	80	
Secretary of the Council of Batavia	80	8
Provisional director of Bengal	80	
Chief of operations in Japan	100	
Visitor general	130	
Secretary of the C. of Batavia	150	
General tax collector	180	
Director in Bengal	180	
Extraordinary member C. of India and director in Soeratte	200	
Governor of Macassar	200	
Elder director in Bengal	200	9
Extraordinary m. C. of India and director in Bengal	200	
Extraordinary member of the C. of India	200	
Extraordinary m. C. of India and Pres. Council of Justice	250	
Ordinary m. C. of India and governor of Ceylon	350	
Ordinary member of Council of India	350	
Director general	500	
Governor general	1200	

[(a)] Originally in the surgery sector; [(b)] originally in the artillery sector