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Paths to higher office: evidence from the Swedish Civil Service *

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The paper analyzes the relationship between career path characteristics of civil servants and their career success. Following a description of the institutional setting and some qualitative evidence on typical paths to the top, we use data that follows the careers of all Swedish civil servants for up to 24 years to document a clear link between early mobility and later success. Controlling for a wide range of other factors, incidents of inter-organizational mobility within the administration, but also interchanges between the administrative and other sectors are positively associated with becoming a senior government official. We also show that the positive association between mobility and future success is smaller for more educated workers, which is consistent with signalling effects driving the link between mobility and career success.

Keywords: public sector employment; job mobility; internal labour markets; signalling; promotions; Swedish civil service.

JEL-Codes: J45, J62, M51.

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1. Mobility patterns and career outcomes

This paper looks at the relationship between career path characteristics of Swedish civil servants and their career success. From an extensive dataset containing around 75,000 Swedish administrators' careers we have detailed knowledge of where people worked, when they changed organizations within government, and even when they changed to employers in the private or non-commercial/non-governmental sectors. We use this data to construct variables capturing characteristics of these administrators' past career patterns—most importantly their mobility between organizations—and test these variables' explanatory power as to whether the observed individuals reach a position where they are considered a senior government official (SGO), a status which we use as an indicator of career success.

Exploring this relationship contributes to the comparatively scarce but growing empirical literature on career paths within personnel economics. Understanding the existence and functioning of internal labour markets, as first characterized by Doeringer and Piore (1971), has recently received considerable academic attention and advancement thanks to studies by Lazear and Oyer (2004*a,b*) for example, who characterize firm-internal and external job mobility in the Swedish private sector. The paper at hand is among the first to explicitly focus on a public sector setting, and it is also the first to use high-quality and comprehensive Swedish data following a large number of individuals over several years through public as well as private sector employment. It therefore contributes to understanding empirically how people pursue careers within and between organizations, and it does so for a sector that in some developed countries accounts for nearly 30% of total employment (OECD 2008: 13).

Moreover, there are two theory-driven motivations for this research. First, personnel economics has identified a number of mechanisms which could imply that early-phase career patterns are correlated with (or 'predict') later career success. At one end, there are those based on *experience* or human capital acquisition. They contend that the early phases in someone's career serve as preparation and training for later management challenges, e.g. due to gaining experience on the job (Jovanovic and Nyarko 1997; Gibbons and Waldman 1999)¹ or special internal training (Demougin and Siow 1994). At the other end there are *informational* arguments based on ability signalling, which may work through various types of signals such as early career speed (Bernhard 1995), self-sorting or "screening" (Rothschild and Stiglitz 1976), and engaging in other costly activities to credibly signal ambition, commitment to the job, and management suitability.

¹ An empirical reference on this particular point is van den Berg, Holm and van Ours (2002).

ity. Job mobility or intra-governmental “department hopping”, that we investigate in this paper, can be an indicator of either types of theories.² Therefore, we also present some additional evidence on *why* early career patterns predict future success in an effort to pin down the mechanism is at work.

The second theoretical motivation for this research concerns employees’ incentives how to choose their career paths. Indeed, it can be argued that finding a strong link between career patterns today and career success tomorrow may be bad news. In the context of this paper the basic argument goes as follows: If it is the case that in the Swedish administration more mobile employees are more successful, then it is likely that young recruits (implicitly or explicitly) understand this relationship. Those who are very motivated and eager to reach a high-level position will then be tempted to undertake job changes merely as opportunistic “careering activities”. This need not be harmful, but it may well be, as the analysis in Brösamle (2010) suggests. It certainly is if individual career incentives lead to above-optimum mobility which then interferes with people’s optimal skill development. Excessive rotation is also a problem if it leads to an inefficient allocation of talent. Indeed, herein lies one of the main reasons for why studying signalling effects from career patterns may be particularly relevant in a public sector setting. As is widely acknowledged, in the typical public sector setting—and arguably also ‘bureaucratic’ parts of companies—performance is harder to measure precisely (see e.g. Dixit 2002). This implies that explicit benefits are usually lower-powered, which one generally observes, and it also opens the door for stronger signalling through potentially informative clues about employee valence.

Our results speak a fairly clear language. We find solid evidence that intra-governmental job mobility and interchanges between the government and other sectors—the so called ‘revolving doors’—are relevant and reliable predictors of people’s career success. This holds using a range of different estimation techniques and model specifications. Although the nature of the data does not allow us to rule out completely that the results are partially driven by people’s unobserved characteristics, such as innate ability or leadership suitability, several robustness checks suggest that the association may be causal.³

Keeping the caveat concerning causality in mind, we finally try to differentiate be-

² A third possible explanation is that mobility extends one’s professional network and thereby enhances information about opportunities for advancing (see e.g. Calvó-Armengol and Jackson 2004), or even access to such opportunities directly. While it would be possible to test for networks effect directly using the data at hand, this must be left for future research due to the fundamentally different methodologies involved.

³ Eliminating unobserved heterogeneity is not possible mainly because the data dictates to focus on the one-time incident of reaching SGO status at some point, which makes any panel techniques exploiting ‘within variation’ obsolete.

tween the mechanisms that may lead to job mobility affecting overall career success. Specifically, we try to discriminate between the mentioned *informational* mechanisms such as ability signalling, and *experience* or skill acquisition mechanisms. Using a test related to those employed by DeVaro and Waldman (2007) and Belzil and Bognanno (2004), the evidence presented in this paper suggests that the link between changing organizational unit within government and success may be driven by ability signalling rather than experience gaining.

Related literature

There is little quantitative empirical literature on career patterns of public employees and we know of only one which relates career patterns to the likelihood of success.⁴ More commonly addressed are questions of how success in the public sector relates to educational background (e.g. Bowman and Mehay 2002), social background (e.g. Hartmann 2002), or gender issues (Pema and Mehay 2010). These studies are important but only of limited relevance to our work. We try to solely focus on explanatory factors that emerge *after* someone has started a career in government. We thus want to control for everything that studies like the afore-mentioned ones have very legitimately put their main focus on.

As far as careers and paths to higher office are concerned, the political and administrative science literature has produced a number of qualitative studies. The bibliographic approach to careers in the British civil service by Theakston is a good example (1987; 1995). European comparative perspectives on “rewards at the top” are offered by Hood and Peters (1994), and on bureaucratic elites more generally in Page and Wright (1999), which also contains a very informative chapter on Sweden by Pierre and Ehn (1999). Noteworthy is also Heclø and Madsen’s (1987) work on policy making in Sweden more generally.

More quantitative studies on careers and promotions inside organizations have mainly been undertaken by personnel and other economists. All of these studies, except for the analysis of a public university by Haeck and Verboven (2011), are based on *private* sector data, which underpins our public sector study’s uniqueness. The communality of all these papers is that they draw on Doeringer and Piore’s notion of “internal labour markets”, according to which individuals have careers within a set of governed career rules, rather than “competing in a series of spot markets” (1971: 882). It is a conception of corporate organizations that lends itself well to the analysis of classic civil service systems. The

⁴ It is Haeck and Verboven (2011) discussed below.

key studies that we know of shall be discussed very briefly.

Baker, Gibbs and Holmstrom (1994) present a comprehensive account of careers inside a medium-sized US financial service firm. While their approach is largely descriptive, they were among the very first to expose the internal labour market notion to a reality check. Focussing on Doeringer and Piore's predictions on wages and pay, they find several characteristics of the internal labour market but their main conclusion is that no one theory of wages and promotion can explain all the phenomena that they observe. Seltzer and Merrett (2000) investigate historic personnel data from the Union Bank in Australia. The career institutions at the time are reported to exhibit quite a few characteristics of civil service systems, such as a clear rank structure, impersonal rules for pay and promotion, a shielded internal labour market, and high rewards for long-term tenure within the firm. However, as the authors point out, their paper is more a long-term case study so that results are hard to generalize (577). Similar to that of Baker, Gibbs and Holmstrom, their main conclusion is that no one theory can explain all of the encountered career patterns and personnel management institutions. A paper by Ariga, Ohkusa and Brunello (1999) is mainly interested in the dilemma of selecting future leaders early (and giving them special treatment compared to less promising employees) versus preserving cohorts and selecting leaders much later. Based on career data from a Japanese manufacturing firm the paper finds evidence for promotion fast tracks even after controlling for time invariant ability. Human capital accumulation effects might be a possible explanation for this, as the authors suggest.

Lazear and Oyer (2004*a,b*) analyze job mobility within and between Swedish firms to show that mobility patterns clearly hint at the general co-existence of internal and external labour markets. They find that larger Swedish firms (with at least six or seven different levels of job types) hire internally and externally to fill vacancies at all of these job levels. The authors also find that wages are influenced substantially by external factors, clearly rejecting the hypothesis of internal labour markets in private sector companies providing effective protection from external wage pressures.

One of few public sector studies is Haeck and Verboven (2011), who study promotion to different professor-level positions in a Belgian university. They argue that a high early-phase career speed implying greater promotion chances is consistent with learning theories working through a signalling effect, whereas a slow initial career speed predicting greater promotion chances would hint at a human capital acquisition 'story'. They find evidence for fast tracks and thus give the former explanation precedence over skill acquisition. They also show, though, that the fast track effect weakens when performance (publications, citations, and teaching load) is controlled for. The authors do, however,

focus on promotion probabilities by hierarchical level without analysing the long run relationship between early mobility and later success, which is the focus of this paper.

Belzil and Bognanno (2008, 2004) test a number of hypotheses concerning pay using data of mid and top-level executives from over 380 U.S. firms. First, they confirm the commonly hypothesized convexity of pay structures. Second, they also estimate how past career patterns affect current chances of promotions using a model that accounts for a variety of individual-specific, firm-specific and other factors. Among other things they find modest fast track effects for some types of individuals. As will be detailed below, they seek to discriminate between the channel through which fast tracks operate: signalling or skill acquisition. They conclude that it is most likely signalling because less educated and newly recruited employees experience stronger fast track effects.

Our paper speaks to very similar questions, including trying to discriminate between signalling and skill acquisition effects. The main differences between many of the aforementioned and our study is of course that we analyze a public sector setting with a dataset of previously unknown size and power, that we focus on mobility between ‘firms’, and that we take overall career success as the outcome of interest—a choice that is largely dictated by the nature of our data (becoming a senior government official is not a repeated event).

The remainder of the paper is structured as follows. Section 2 presents some background information on the institutional environment of the Swedish civil service and typical career paths therein. Section 3 describes the data and presents descriptive statistics to make some first inferences about the mobility patterns within the Swedish administration. The methodology and the main regression results are presented in Section 4, which also summarizes the results of robustness checks. Section 5 aims to discriminate between possible mechanisms driving the results before the last section concludes.

2. The Swedish administration

Institutional environment

In this section we summarize the picture emerging from existing, mostly qualitative, studies of the Swedish civil service. The Swedish civil service is in charge of administering what is often claimed to be the role model of a modern welfare state—one of the largest in the world in terms of employees per population and budget per GDP. The public administration literature, for example Peters (1995: 145), claims that for this reason good management and competence among its staff have always been a matter of high importance in Sweden—and of great interest by researchers all across the world—, and

that Swedish civil servants generally enjoy high prestige. Traditionally, they operated according to the Weberian principles of legality, impartiality, and legal security, which in recent years however increasingly faced challenges from the efficiency agenda of New Public Management (NPM) reforms and the fact that the Swedish bureaucracy is viewed to be an agent for social change (Pierre and Ehn 1999: 250).⁵

Regarding civil servants' careers, two characteristics of the Swedish state are particularly noteworthy. The first is the importance of local government autonomy alongside the existence of a centralized unitary state. The regional administration (*länsstyrelser*) carries out much of the cross-sectoral policy implementation and oversight functions of central government policy at the local level (Pierre 1995: 141). This, it is argued, makes employees of peripheral government bodies well-equipped to continue their career in central government. The second is the relatively low level of discretion that politicians have over the civil service. Pierre remarks that the Swedish bureaucracy is one among the most autonomous of all Western states (151). Policy planning and implementation are separated: the former carried out by the departments (*departement*), the latter by the agencies (*ämbetsverk*).

The Swedish civil service system can be described as meritocratic with purely qualification-based recruitment; promotion is mainly based on expertise and tenure. Political influence over staffing and appointees are not very common and if so only at the very top levels. In the ministries only the minister and his or her advisors (*sakkunniga*) are actual appointees. The administrative heads of ministries (for whom labels differ across countries, in Sweden *statssekreterare*) are often also considered political appointments because there is substantial political influence over their staffing even though they are regularly recruited from the civil service. But any such influence is absent only one level below. In agencies it is often only the head of the agency (*generaldirektör*) who is *de facto* politically appointed (Pierre 1995: 143), and even here most are recruited from the civil service.⁶

The most striking characteristic of personnel management in the Swedish civil service is probably its decentralized nature. It leaves great freedom for individual organizations to advertise jobs and hire their own personnel. This freedom is limited and governed by regulation specifying the requirements of suitable candidates (Peters 1995: 146). The Swedish Civil Service is a generalist service nevertheless, especially at higher levels. In

⁵ For a critical view on 'the fall of the strong state' see Lindvall and Rothstein (2006).

⁶ There seems to be some disagreement over the degree of political influence in agency head staffing decisions. Sjölund (1994: 127) states that between 1976 and 1982, less than a quarter of all agency heads had a private sector or political background. On the other hand, Pierre and Ehn (1999: 252) argue that they are *de facto* political appointees (although merit criteria have to be met).

principle lawyers, political scientists, and economists—to name the three most recruited fields of study—all have the same careers. Interestingly though, this does not imply that there is vivid interchange and movement between ministries and agencies. For the agencies this is mainly due to the specialist character of the work. Interchange between ministries is reported to be somewhat higher, but remains low even after two reforms (in 1984 and 1997) seeking to change this (Pierre and Ehn 1999).

3. Data and methodology

3.1. Research question and study design

In this paper we seek to investigate how inter-organizational job mobility relates to career success in the Swedish administration. Specifically, we ask how ‘department hopping’—that is, changes from one organization within the Swedish government to another—earlier in someone’s career are associated with, or maybe even affect the chances of him or her becoming a senior government official (SGO). We ask the same question for ‘revolving doors’—that is, interchanges between government and the private and non-governmental sectors. The theoretical motivations for doing so were discussed above and both, those based on human capital acquisition and those based on ability signalling or sorting, make us expect a positive relationship between past mobility and the chances of becoming an SGO. We study this link primarily by running Cox duration or hazard analyses of the ‘risk’ of entering the status of SGO using an extensive dataset on Swedish civil servants’ careers. We turn to describing the dataset now.

3.2. Data and descriptive statistics

3.2.1. Data

The raw dataset covers the career histories of every individual that ever worked for the Swedish government administration between 1985 and 2008. It is primarily drawn from the Structure of Earnings Statistics (SES), which is an annual survey covering every employee in all parts of government. From this the initial selection of our population of interest is based on Swedish industry codes (SNI/NACE), which allow us to identify the central government administration including its many agencies, but excluding armed forces, regional governments, and specific delivery sectors such as health care, education, environmental programmes, and support activities where we would expect career patterns to be substantially different from the core of executive government. The SES data only covers spells of employment in government. We therefore balance the panel

by filling periods of temporary employment outside government and periods before or after working in government with data from the Register Based Labour Market Statistics (RAMS), which is an economy-wide database of tax records and other individual-specific information. This allows us to start out with data on the careers of around 75,000 individuals over 24 years, containing around 1.5 million observations with a high degree of detail during periods of government employment and somewhat less information during periods of employment elsewhere, but it remains well sufficient to follow individuals' job mobility patterns.

The finally analyzed sample is obtained by imposing further restrictions. We take the stock sample of everyone working in the Swedish administration in either 1995, 1996, or 1997. The window of sampling is chosen in the middle of our observation period to have information about the *past* career going back at least ten years. This also enables us to be sufficiently precise when excluding everyone who becomes an SGO already before 1995, which we have to do because we treat the event of attaining SGO-status as an 'absorbing state'. (We are mainly interested in whether someone makes it to the top *at all*. Regaining an SGO position after having left one for a short while is surely driven by factors that are very different from those relevant during the run-up to the first one. Our model specification would therefore hardly be appropriate to explain multiple spells by the same individual.) We stock sample on three years to avoid missing mothers on maternity leave and other temporary leavers. Finally, we restrict the sample by dropping individuals with less education than upper secondary schooling.⁷ By doing so we only lose a handful of individuals who eventually become senior officials but presumably avoid a lot of 'noise' from the careers of the rank and file and other support workers (which we are not focussing on). In the end, we run most of our estimations using information from over one million observations from over 44 thousand individuals.⁸

Main event of interest: becoming a senior government official

The event that we are mainly interested in (which will be the 'failure event' in the hazard model and the dependent variable in the logit specifications) is the incident of someone reaching a high-ranking position in the Swedish Government for the first time. Specifically, we take the incident of an individual being classified as 'Legislator or Senior

⁷ While we are indeed primarily interested in careers of the administrative elite, we clearly have to retain individuals without university degrees because due to Pierre and Ehn (1999: 259) only around 90% of all senior civil servants held university degrees when they wrote their study.

⁸ Note that the regression tables presented below report around 575,000 observations or less. The figure is well below one million because the information from the first ten periods of each individual is summarized in the career history variables of other observations. This will become clearer below.

Government Official’ by the Swedish Standard Classification of Occupations (SSYK)⁹ as our main event of interest, which is captured by the variable *Ssyk111*, which takes the value one if someone has an SSYK-code of 111x and zero otherwise. This classification primarily contains people titled *departementsråd* (assistant under-secretary) and *generaldirektör* (director general). Much more rarely also *ambassadör* (ambassador), *ambassadråd* (counsellor), *länsråd* (county director), *rättschef* (‘legal supervisor’), and *sakkunnig* (special advisor). While the classmark in general also contains a number of positions that are more political than administrative in nature, we ensure that our final sample is free of most of those cases. For example, cabinet ministers (*statsråd*) also have a SSYK-code starting with 111, but virtually none of them has previous public sector employment so that they are not selected in our stock sampling on the 1995–1997 interval with all ‘early failures’ being excluded. Moreover, most of the relatively few *statssekreterare* (state secretaries) and *politiskt sakkunniga* (political advisors) among the SGOs may also be considered at least semi-political appointments. Interestingly, when we manually checked a small representative selection we found that nearly all of them are recruited from within the civil service. So they are in our sample and we cannot eliminate them,¹⁰ but we contend that their success may be viewed as success in administration—in which organization are there no “politics”—so that we accept these few cases to remain. Indeed, this practice finds further support by the fact that the definition of the Swedish bureaucratic elite developed by Pierre and Ehn (1999) also contains *statssekreterare*.¹¹ All other categories they include coincide very well with the SSYK-classification, namely assistant under-secretaries (*departementsråd*), and for the agencies director generals (*generaldirektör*), and the section managers (*avdelningschef*). So all in all, the group marked by the dummy *Ssyk111* is similar although somewhat more lavish than the definition of the Swedish administrative elite which is the best-established one in the public administration literature. The precise numbers will be discussed below, just note for now that the identified group entails less than 1% of the sampled individuals.

A technical difficulty arises because in the original data the SSYK-codes are only available from 1995 onwards. For 1985 to 1995 (inclusive) there exist an older and in fact more detailed job classification (*tjänstekod*). We exploit the overlapping year 1995

⁹ It coincides with the *International Standard Classification of Occupations (ISCO-88)* coding scheme.

¹⁰ This is because we only have detailed position labels, so called *tjänstekods*, up to 1995.

¹¹ However, Pierre and Ehn (1999) admit they do this primarily to have their bureaucratic elite comprised of two rank levels rather than just one (251). Senior ministers, of which there exists one per ministry, and associate ministers (*biträdande minister*) are clearly political positions and are not part of our definition.

to construct the SSYK-codes for the period prior to 1995. While not every *tjänstekod*-SSYK combination occurs in 1995 for a perfect reconstruction to be possible, we find unambiguous matches for 92% of the *tjänstekods* occurring between 1985 and 1994. Of course, the sample restrictions discussed above imply that no reconstructed case of Ssyk111=1 ends up being one of our ‘failing’ individual, but the pre-construction is nevertheless crucial to identify and drop individuals who obtain SGO-status.

Other events of interest: entry into the Civil Service and into middle management

Before becoming an SGO there are two other events of interest: 1) entering into government employment for the first time, and 2) becoming a middle manager in the Swedish government.

The latter event is straight forward to define because in the data it is recorded as an SSYK classification of 1xxx.¹² The former incident, entry into public employment, is less easy to determine because the data is truncated. Just under half of the individuals we observe are employed by government already in 1985 so that we cannot be sure when they actually started working there. To gauge the severity of this left-truncation problem, we classify a spell as truncated if the individual is employed in the government administration in either 1985, 86, or 87. Thereby, we only falsely label as non-truncated individuals who work outside government for more than three consecutive years. Descriptive statistics (similar to those discussed next) differentiating by truncated and non-truncated spells are available on request. More importantly, we later use the truncation classification to run a robustness check based on a smaller sample of pure civil service *entrants*.

Descriptive statistics by later success

Table 1 reports a number of sample summary statistics at the three career stages that individuals can go through: first entry into government employment; second, holding a middle management position for the first time; and third becoming an SGO for the first time. For each of those career stages it gives summary statistics for the full sample, and then for individuals that later become SGOs versus those that do not. Already here important insights into the mobility patterns of Swedish administrators and how they may relate to later success can be won. The figures also reveal information about internal and external management recruitment patterns. Note that Table 1 contains

¹² Note that this definition obviously includes all incidents of people going straight from no management status into a senior position. But the problem is minor: only 181 out of the 3,489 middle managers are in fact senior government officials straight away.

summary statistic including individuals with truncated spells. But to assure sceptical readers upfront, we deal with this problem in Section 4.3 where it is shown that our core results hold up when using a sample of restrictively defined entrants.

In Table 1 the first and second lines of numbers give a feel for the sample sizes: only 7.85% of all civil servants ever enter middle management, and only 0.73% ever become SGOs (325 in absolute numbers). Nearly 65% of later SGOs are male, while only about 44% of all civil service entrants are male. Interestingly, this divide already occurs at the middle management level where the overall share of males is 66%. While the figures on age bear no surprises, one should note that the highest educational attainments of later SGOs differ substantially from those of non-SGOs. As one would expect, at the entry stage the two lowest educational levels are represented with around 47% and 7%, respectively, while among SGOs these shares drop to 5% and around 2%, respectively. The reverse trend applies to higher academic qualifications, which only 45% of entrants hold (summing both figures), while nearly 94% of all SGOs have higher academic qualifications.

The figures on the sectors that people worked in during the period prior to reaching the three different career stages yield insights into recruitment patterns. Focussing on the aggregate figures of middle and senior managers in columns (4) and (7), one can see that recruitment straight from the private sector is rare at all public management levels (2.52% and 1.23%, respectively). It is more common to move from other non-administrative but also non-commercial sectors, such as NGOs, interest groups, local government, and the like. Nearly 14% of all middle managers come directly from there, but only just over 5% of SGOs. The rule seems to be that managers are recruited from within the core administration, which applies to 73% of middle managers and even 80% of SGOs.

The mobility patterns prior to becoming a middle or top-level manager (bottom two lines of the table) reveal that around a fifth to a quarter of managers ‘revolve’ into their first management job from a non-administrative position.¹³ The share of people changing organization within the administration immediately before taking their first mid or top-level management position is fairly low, with 5.82% and 9.23%, respectively. Columns (5) and (6) reveal that later SGOs seem to be much more mobile already when reaching the lower hierarchical ladders. Revolutions from outside the administration, but also internal changes into the first middle management job, are both much higher for

¹³ Note that this includes years of no recorded employment, which is why the figures in ‘Revolved into current Position’ are usually higher than the sum of ‘Worked in Private Sector’ and ‘Worked in Other Sector’.

later SGOs than for others (37.85% versus 22.99% and 10.46% versus 5.34%). Looking at the bottom two lines in columns (4) and (7) of Table 1 shows that averaged across the whole government administration, organizations recruit about 70% of the middle and top managers internally, while around 30% come from other government organizations or even another sector. These shares differ by management level: Revolutions from the non-administrative sector is higher for middle managers (24.39%) than for senior officials (20%).

All this suggests that, on the one hand, organizations in the Swedish government administration have internal labour markets. On the other hand, there is also a substantial amount of external mobility, suggesting that the system is best characterized as a *permeable internal labour market*. The descriptive statistics also reveals that mobility patterns clearly differ systematically with people's later success. It is this aspect that we focus our further attention on.

As a first step, a brief look at Table 2 is worthwhile. Here, we report the number of years that individuals with non-truncated spells have worked in different sectors when entering the three career stages. The columns now differentiate the figures by whether individuals one day become SGOs or not. The main insight here is that already when entering the middle management level the composition of work experience of later SGOs differs from that of later non-SGOs. As can be seen in columns (5) and (6), when becoming middle managers later SGOs are less likely to have had private sector experience and more likely to have had non-administrative work experience than individuals who do not become SGOs in the future. Even more interesting, they reach mid-level management positions with, on average, less administrative work experience than their less successful peers. This may be due to SGOs having faster careers from early on, which is further supported by the fact that they enter middle management earlier.¹⁴

It can also be seen that there are differences between later SGOs and later non-SGOs in terms of the number of mobility incidents they exhibit when becoming middle managers. Later SGOs have changed organization within government on average 0.5 times compared to later non-SGOs with only 0.33. Similarly, they revolve into government from other sectors 1.59 times compared to only 1.24 times of later non-SGOs. Also these differences will be subject to further scrutiny below.

¹⁴ This is consistent with fast tracks, such as in Baker, Gibbs and Holmstrom (1994).

Table 1: Individual characteristics at different career stages (by later success)

| Stats for Individuals entering | First Gov Employment | | | First Middle Mmnt Position (ssyk1) | | | SGO (ssyk111) |
|---|----------------------|------------------|---------------------|------------------------------------|------------------|---------------------|--------------------|
| | Full Sample (1) | Later SGO (2) | Later no SGO (3) | Full Sample (4) | Later SGO (5) | Later no SGO (6) | Full Sample (7) |
| <i>Sample Information</i> | | | | | | | |
| Number of Individuals | 44,444 | 325 | 44,119 | 3,487 | 325 | 3,162 | 325 |
| Share of 1st-Time Gov Employees | 100 | 100 | 100 | 7.85 | 100 | 7.17 | .731 |
| Number of Observations | 1,021,331 | 5,166 | 1,016,165 | 78,542 | 5,166 | 73,376 | 5,166 |
| <i>Individual Characteristics</i> | | | | | | | |
| Male (share) | 44.1 | 64.6 | 44 | 66 | 64.6 | 66.2 | 64.6 |
| Immigrant (share) | 7.92 | 6.15 | 7.93 | 5.53 | 6.15 | 5.47 | 6.15 |
| Age (Mean) | 37.1 | 39.2 | 37 | 48.2 | 46.5 | 48.4 | 50.2 |
| Age (Min) | 18 | 23 | 18 | 26 | 26 | 26 | 26 |
| Age (Max) | 64 | 57 | 64 | 64 | 64 | 64 | 64 |
| <i>Highest Education (shares)</i> | | | | | | | |
| Edu Upper Secondary | 46.8 | 4.92 | 47.2 | 10.1 | 4.92 | 10.6 | 4.92 |
| Edu Short Tertiary | 6.98 | 2.15 | 7.01 | 4.7 | 2.15 | 4.97 | 2.15 |
| Edu Long Tertiary | 43.6 | 80.3 | 43.4 | 78.2 | 80.3 | 78 | 80.3 |
| Edu Postgrad or PhD | 2.55 | 12.6 | 2.48 | 7 | 12.6 | 6.42 | 12.6 |
| <i>Sector in Previous Period (shares)*</i> | | | | | | | |
| Worked in Administration | 0.00 | 0.00 | 0.00 | 73.57 | 59.54 | 75.03 | 80.00 |
| Worked in Private Sector | 14.18 | 5.96 | 14.26 | 2.52 | 1.97 | 2.58 | 1.23 |
| Worked in Other Sector | 20.07 | 44.92 | 19.89 | 13.79 | 15.38 | 13.63 | 5.23 |
| Worked in Middle Management | n/a | n/a | n/a | n/a | n/a | n/a | 32.92 |
| <i>Mobility Incident Prev Period (shrs)</i> | | | | | | | |
| Revolved into current Position | 51.31 | 67.08 | 51.20 | 24.38 | 37.85 | 22.99 | 20.00 |
| Intra-Gov Change into current Position | n/a | n/a | n/a | 5.82 | 10.46 | 5.34 | 9.23 |

*) Note that the first three lines of this part of the table do not sum up to 100% because of truncated spells and individuals being in spells of no employment.

Table 2: Career characteristics (cumulative over current and previous 10 years) at different career stages (by later success, only non-truncated)

| Stats for Individuals entering | 1st Gov Employment | | | 1st Middle Mmnt Position (ssyk1) | | | SGO (ssyk111) |
|--|------------------------------|--------------|-----------------|----------------------------------|--------------|-----------------|------------------------------|
| | All Non-Trunc Individuals | Later SGO | Later no SGO | All Non-Trunc Individuals | Later SGO | Later no SGO | All Non-Trunc Individuals |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| <i>Time Worked in Different Sectors</i> | | | | | | | |
| Years Worked in Administration | 1.00* | 1.00* | 1.00* | 7.43 | 6.10 | 7.67 | 6.81 |
| Years Worked in Private Sector | 2.19 | 1.14 | 2.20 | 0.65 | 0.47 | 0.68 | 0.39 |
| Years Worked in Other Employment | 2.71 | 5.95 | 2.68 | 1.69 | 2.65 | 1.53 | 2.36 |
| Years Worked in Middle Mmnt | 0.01** | 0.24** | 0.01** | 1.00* | 1.00* | 1.00* | 2.55 |
| <i>Cumulative Incidents of Mobility</i> | | | | | | | |
| Number of Intra-Gov Changes | 0.00 | 0.00 | 0.00 | 0.36 | 0.50 | 0.33 | 0.52 |
| Number of Revolutions from Other Sectors | 1.00*** | 1.00*** | 1.00*** | 1.29 | 1.59 | 1.24 | 1.51 |

*) Figures are measured end of period, thus they are all one.

**) These very low shares arise from those few entrants who start as a middle managers right away.

***) Revolve also counts the first incident of entering government employment.

4. Method and results

4.1. Methodology of multivariate analysis

The brief overview of descriptive statistics shows that it is worthwhile taking a closer look at earlier career patterns and later career success. To do so, we employ multivariate duration or hazard models to control for as many as possible confounding factors. This section presents the method, explains how we define analysis time, how we construct the main explanatory variables, which controls we include, and in which ways we deal with other potential problems.

The hazard model

Duration analysis or hazard models are a statistical technique mainly developed to analyze the determinants of the duration that it takes for a particular event to occur. Just as in any regression analysis, this is done by exploiting the variation in duration and differences along other observable dimensions (that is, covariates) across a larger number of subjects. The heart of hazard analysis is the *hazard function* $h(t)$ which describes the hazard of ‘failing’—which in our context means quite the opposite, namely succeeding to become a senior government official—at time t conditional on having survived until t . $h(t)$ can vary between zero and one. A possible interpretation of it is the number of failures one would expect to observe among some population during a certain interval at a given point in time. For our purposes, such interpretations are not essential as we are more interested in how other events—especially having changed organization in the last ten years—affect the instantaneous rate of failure $h(t)$.

An individual’s hazard can be written in a form that appears (and to some extent is) quite similar to more commonly known statistical models:

$$h_i(t) = g(h_0(t), \beta_0 + X_i' \beta_X),$$

where g is some function, $h_0(t)$ is the so called *baseline hazard* that is assumed to be the same for every individual,¹⁵ β_0 is a constant, and X_i is the covariate matrix and β_X its vector of coefficients to be estimated. Here we employ the perhaps most commonly used form of duration models: namely the semi-parametric Cox model, which has the neat property of not imposing any functional form on the baseline hazard. At the same time though, it is a proportional hazard model meaning that the covariates in X are parametrized so that they multiplicatively ‘shift’ the baseline hazard. The general Cox

¹⁵ We conduct robustness checks by relaxing this assumption through stratification.

model's formulation is

$$h(t | X_i) = h_0(t) \exp(X_i' \beta_X),$$

with $h_0(t)$ remaining parametrically unspecified and unestimated.¹⁶ This has the effect that over time the baseline hazard can take any (including non-monotonous) form.

We now turn to discussing the crucial issue of analysis time as well as providing details on the explanatory and control variables that form the matrix X .

Time in the analysis

In hazard analysis the definition of the start of the risk period is crucial. This is, however, hardly straightforward with the left-truncated data that we have. For our purpose the start of the risk period could either be defined as entry into government employment or as entry into professional life more generally. We have to estimate one of these events because we do not have precise data on either event. Estimating entry into professional life can easily be done using the information on schooling, education, other formative periods, and year of birth. Checking for the number of individuals for which the estimated entry into professional life lies *after* actual entry into civil service employment reveals that there are only 33 such cases. We deem those an acceptable inaccuracy, especially in the light of part-time education and job entry potentially overlapping.

Main explanatory variables

As stated earlier, the main focus lies on how a number of variables that contain information on the past career of an individual affect the likelihood of becoming a senior official. The analysis focusses on two specific types of job-mobility: changes between organizations that are all part of the government administration (intra-governmental mobility or 'department hopping'), and changes from an organization outside the administration into an administrative one ('revolving doors').

Each aspect is captured by a set of lagged variables and a cumulative measure, which sums up the past incidents of interest over a ten-year moving window. Thus, intra-governmental job mobility is captured by the variables *Intra-Governmental Changes t-x,y* (where x and y stand for period lags) and *Cumulative Intra-Governmental Changes*. The former is a dummy indicating at a given time whether the subject changed organization either x or y periods ago, or both. (Note that always two periods are bundled together only to reduce the number of variables to deal with.) *Cumulative Intra-Governmental*

¹⁶ For a more comprehensive presentation of the Cox model see for example Cameron and Trivedi (2005: 592 ff.).

Changes is defined as

$$\hat{M}_{[1,10]} = \sum_{t=-10}^{t=-1} M_{it},$$

meaning that it cumulatively sums over the number of times an individual has changed organization in the past ten years. The higher it is, the less of a single-ministry career someone has had.

The way in which these organizational change variables are constructed from changes in individuals' employer codes deserves a short explanation. The data contains an organization and an establishment code for every individual in each period. Unfortunately, neither changes in the code of establishment (which is a physical address) nor changes in the code of the organization (which is an organizational unit) fully capture the event of interest, namely the incident of someone actually working for a new ministry, agency, or other kind of body. The establishment code can change quite arbitrarily, specifically when two out of the following three things change: address, name of associated organization, and industry code. A change in the organizational code may simply be due to the establishment in which an individual works being re-organized during a merger or split-up of ministries. An actual intra-governmental organization change in year t as captured by the variable is therefore recorded if in t an individual has organizational and establishment codes that are both different from those in $t - 1$, but which still belong to the government administration.

The second set of career variables are changes between the government and other sectors. Here the focus is on incidents of changing from the private into the public sector as well as from other non-administrative sectors into government administration; i.e. any kind of mobility that is not intra-governmental is captured. One could capture these two types of mobility in separate variables, but since the number of incidents is quite low and both are forms of external mobility, we treat them jointly. The variables recording these incidents are named *Revolve $t-x,y$* and *Cumulative Revolve* and both are constructed analogously to those on intra-governmental changes.

Both types of lagged mobility variables are included with lags x and y taking the value pairs 1,2; 3,4; 5,6; 7,8; 9,10. The cumulative variables are included on their own as they summarize the same ten-year moving window in a single variable.

The theoretical predictions suggest that each of these variables should be statistically significant, with the hazard ratio magnitude indicating whether the respective career move is conducive or detrimental to rising high in rank. Hazard ratios above one on both, the intra-governmental change as well as the revolve covariates are expected.

Other control variables

All the regressions control for a number of individual characteristics, such as gender, immigrational background, and dummies for the highest educational level achieved as well as in which subject area this was. They also take account of whether people are working full time or part time. This is of special importance in the Swedish context because fairly generous part-time entitlements after parenthood are widely used. *Share Full Time* is therefore included in all regressions, a variable that captures the average share of full-time that an individual worked during times of employment (again in a moving window of the previous ten years). In every specification the different ages of the subjects are controlled for by either an age variable or by letting the baseline hazard of the Cox model vary for each birth year cohort.¹⁷

As was revealed by the descriptive statistics presented above, there is variation in people's career patterns that is not mobility related. For example, individuals differ in terms of whether (and for how long) they work in middle management, or in administration more generally. While it is impossible to take account of all of these aspects, two basic ones are controlled for in selected specifications: the cumulative number of years that someone has worked in government administration (*Years in Administration*), and the cumulative number of years that someone has already been a mid-level manager (*Years in Middle Management*).

The decentralized nature of recruitment to the Swedish civil service gives rise to the concern that career success is also determined by the department in which someone starts and later on spends his or her career. As in most countries, also in Sweden there is a 'hierarchy of prestige' among ministries, that one would expect positive career effects from having started the career in one of the 'elite' departments. In contrast, working in these departments at later career stages may have a positive or negative effect—competition for promotion may be tougher, for example. In any case, controlling for the initially recruiting department, and later the employing department would be desirable. Unfortunately, the left-truncation of the data makes it impossible to clearly identify people's initial employing bureau. A blanket-style solution would be to include a dummy for *every* organization in the dataset, but this would overwhelm even the power of this dataset. More feasible is to control for effects that are specific to the various SNI/NACE-indexed subsectors of the Swedish administration. And since there

¹⁷ This technique is referred to as stratification in duration analysis. It is unrelated to sample stratification as commonly known. It is more flexible than including a dummy for each 'stratum' in that it not only allows the baseline hazard $h_0(t)$ be shifted multiplicatively but it can take any form for each stratum. Stratification is also computationally more efficient than dummies, which is not irrelevant when using such a large dataset.

are separate codes for fiscal administration and foreign services, among many others, it should capture the most important variation. Below this is implemented using industry code strata, for the same reasons as birth year strata were used earlier. The downside is that complete industry codes are unavailable for periods during which individuals work outside the administration. The number of observations that enter the estimation is therefore lower in these columns and the results have to be interpreted with some caution—these data are obviously not missing randomly.

Another concern is that aggregate shocks, such as economic up or downturns, affect the results—and due to the nature of the method this would ‘hit’ different individuals at different points of analysis time. Observation year dummies, which allow to shift the overall hazard over the years are a good way to deal with this, and they are included in some specifications.

Unfortunately, a number of things one would like to control for cannot be included because data is simply not available. The most obvious is some measure capturing innate ability more directly than formal education. Secondly, more information on people’s careers before entering the study would be desirable. Due to the number of years that typically lie between starting a career in government and reaching higher office, for the majority of individuals both events do not lie within the study period despite the exceptionally long sample. Cohorts were therefore chosen so that the incident of becoming senior official occurs with sufficient frequency between 1995 and 2008. This comes at the expense of not knowing much about the start of most people’s professional lives.

Discrete-time duration models

Our data are recorded annually; i.e. time is discrete rather than continuous. Together with the extensive use of time-varying covariates, while in principle being compatible with the Cox procedure, this may call discrete-time duration techniques on stage (see e.g. Box-Steffensmeier and Jones 2004). Earlier versions of this paper therefore contained additional tables that replicated the key findings using logit models with the data in person-period format and dummies for the years of analysis time, which is the recommended method to cross-check Cox estimations on discrete-time data (Jenkins 1995). Since the results were robust, brevity is given priority and the logit results are instead available on demand.

Table 3: Intra-governmental changes and career success (Cox)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|-------------------------------|-----------------------|-----------------------|---------------------|-----------------------|-----------------------|-----------------------|
| Intra-Gov Changes $t - 1, 2$ | 2.746*** (0.533) | 2.763*** (0.532) | 1.167 (0.236) | 2.666*** (0.529) | | |
| Intra-Gov Changes $t - 3, 4$ | 2.351*** (0.467) | 2.416*** (0.476) | 1.420* (0.285) | 2.158*** (0.436) | | |
| Intra-Gov Changes $t - 5, 6$ | 1.492* (0.319) | 1.528** (0.324) | 1.030 (0.224) | 1.447* (0.311) | | |
| Intra-Gov Changes $t - 7, 8$ | 2.140*** (0.426) | 2.202*** (0.437) | 1.660** (0.345) | 2.348*** (0.474) | | |
| Intra-Gov Changes $t - 9, 10$ | 1.172 (0.248) | 1.201 (0.254) | 1.339 (0.297) | 1.120 (0.242) | | |
| Cumulative Intra-Gov Changes | | | | | 1.804*** (0.103) | 1.808*** (0.113) |
| Years in Administration | | | | 0.896*** (0.0195) | | 0.891*** (0.0194) |
| Years in Middle Management | | | | 1.484*** (0.0271) | | 1.483*** (0.0270) |
| Share Full Time | 1.022*** (0.00786) | 1.022*** (0.00785) | 1.003 (0.00821) | 1.020*** (0.00697) | 1.022*** (0.00790) | 1.020*** (0.00695) |
| Immigrant | 0.965 (0.225) | 0.905 (0.211) | 1.217 (0.296) | 1.063 (0.250) | 0.938 (0.220) | 1.018 (0.240) |
| Male | 1.402*** (0.172) | 1.364** (0.168) | 1.764*** (0.226) | 1.081 (0.135) | 1.390*** (0.171) | 1.080 (0.135) |
| Edu Short Tertiary | 3.160** (1.650) | 1.903 (1.013) | 3.092** (1.639) | 2.388* (1.251) | 3.265** (1.705) | 2.427* (1.271) |
| Edu Long Tertiary or Higher | 15.93*** (5.857) | 4.107*** (1.830) | 11.40*** (4.286) | 9.733*** (3.612) | 16.29*** (5.980) | 9.716*** (3.605) |
| Education Field Dms | Yes | Yes | Yes | Yes | Yes | Yes |
| Observation Year Dms | | Yes | | | | |
| Birth Year / Age | Strata | Age | Strata | Strata | Strata | Strata |
| Orga SNI Codes | | | Strata | | | |
| Observations | 576,878 | 576,878 | 304,556 | 576,878 | 576,878 | 576,878 |
| Subjects | 44,444 | 44,444 | 44,444 | 44,444 | 44,444 | 44,444 |
| Failures | 325 | 325 | 325 | 325 | 325 | 325 |

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Revolving doors and career success (Cox)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|-----------------------------|-----------------------|-----------------------|---------------------|----------------------|-----------------------|----------------------|
| Revolve $t - 1, 2$ | 2.157*** (0.313) | 2.223*** (0.322) | 1.481** (0.238) | 2.584*** (0.383) | | |
| Revolve $t - 3, 4$ | 1.593*** (0.230) | 1.698*** (0.243) | 1.128 (0.174) | 1.794*** (0.268) | | |
| Revolve $t - 5, 6$ | 1.840*** (0.249) | 1.714*** (0.232) | 1.251 (0.183) | 2.026*** (0.288) | | |
| Revolve $t - 7, 8$ | 2.193*** (0.274) | 2.145*** (0.268) | 1.750*** (0.239) | 2.347*** (0.301) | | |
| Revolve $t - 9, 10$ | 1.037 (0.163) | 1.020 (0.159) | 0.885 (0.146) | 1.056 (0.167) | | |
| Cumulative Revolve | | | | | 2.022*** (0.129) | 2.252*** (0.151) |
| Years in Administration | | | | 0.973 (0.0235) | | 0.972 (0.0233) |
| Years in Middle Management | | | | 1.502*** (0.0280) | | 1.513*** (0.0286) |
| Share Full Time | 1.026*** (0.00859) | 1.026*** (0.00858) | 1.004 (0.00849) | 1.018** (0.00813) | 1.027*** (0.00888) | 1.018** (0.00843) |
| Immigrant | 0.934 (0.218) | 0.888 (0.207) | 1.178 (0.287) | 1.101 (0.259) | 0.933 (0.218) | 1.075 (0.253) |
| Male | 1.484*** (0.185) | 1.437*** (0.179) | 1.783*** (0.229) | 1.174 (0.150) | 1.521*** (0.190) | 1.201 (0.155) |
| Edu Short Tertiary | 3.018** (1.576) | 2.033 (1.082) | 2.998** (1.588) | 2.480* (1.298) | 2.906** (1.517) | 2.384* (1.248) |
| Edu Long Tertiary or Higher | 16.12*** (5.934) | 5.160*** (2.290) | 11.23*** (4.212) | 10.48*** (3.897) | 14.93*** (5.491) | 9.459*** (3.517) |
| Education Field Dms | Yes | Yes | Yes | Yes | Yes | Yes |
| Observation Year Dms | | Yes | | | | |
| Birth Year / Age | Strata | Age | Strata | Strata | Strata | Strata |
| Orga SNI Codes | | | Strata | | | |
| Observations | 576,878 | 576,878 | 304,556 | 576,878 | 576,878 | 576,878 |
| Subjects | 44,444 | 44,444 | 44,444 | 44,444 | 44,444 | 44,444 |
| Failures | 325 | 325 | 325 | 325 | 325 | 325 |

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Jointly estimated cumulative effects (Cox)

| | (1) | (2) | (3) | (4) |
|------------------------------|-----------------------|-----------------------|----------------------|----------------------|
| Cumulative Intra-Gov Changes | 1.908*** (0.109) | 1.908*** (0.105) | 1.378*** (0.0935) | 1.847*** (0.117) |
| Cumulative Revolve | 2.104*** (0.134) | 2.087*** (0.132) | 1.609*** (0.116) | 2.266*** (0.151) |
| Years in Administration | | | | 0.935*** (0.0232) |
| Years in Middle Management | | | | 1.514*** (0.0291) |
| Share Full Time | 1.024*** (0.00890) | 1.024*** (0.00885) | 1.005 (0.00866) | 1.017** (0.00817) |
| Immigrant | 0.935 (0.220) | 0.888 (0.207) | 1.122 (0.277) | 0.997 (0.236) |
| Male | 1.512*** (0.189) | 1.463*** (0.182) | 1.821*** (0.234) | 1.172 (0.150) |
| Edu Short Tertiary | 2.927** (1.528) | 1.870 (0.996) | 2.983** (1.581) | 2.307 (1.208) |
| Edu Long Tertiary or Higher | 14.08*** (5.183) | 4.196*** (1.871) | 10.21*** (3.830) | 8.662*** (3.224) |
| Education Field Dms | Yes | Yes | Yes | Yes |
| Observation Year Dms | | Yes | | |
| Birth Year / Age | Strata | Age | Strata | Strata |
| Orga SNI Codes | | | Strata | |
| Observations | 576,878 | 576,878 | 304,556 | 576,878 |
| Subjects | 44,444 | 44,444 | 44,444 | 44,444 |
| Failures | 325 | 325 | 325 | 325 |

Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

4.2. Main results of Cox estimates

This section presents the results of the duration analyses in various specifications. Tables 3 and 4 contain results from models estimating the effects of intra-governmental changes, and changes between the administrative and other sectors, respectively. In columns (1) to (4) in each table the main variables of interest are the five lagged mobility variables. In columns (5) and (6) our focus lies on the single cumulative in the row just below. The reported estimates are hazard ratios (exponentiated coefficients), which makes their interpretation straightforward. For example, in Table 3 the 2.14 reported for *Intra-Governmental Change t-7,8* in column (1) indicates that someone having changed organization seven or eight years ago is today more than twice as likely to become an SGO compared to someone who has not had this change. Values below one indicate a decreased hazard. For example, in the same table the significant coefficients for *Years in Administration* in column (4) and (6) suggest that, everything else equal, an additional year worked in the administration in the last ten years lowers one's chance to become an SGO by just over 10%. For all hazard ratios it must be noted that they are point estimates and calculated for all variables at the sample mean.

Focussing only on columns (1) to (4) in Tables 3 and 4, it is easily seen that the large majority of the hazard ratios of interest are well above one and highly significant. The main exceptions are those indicating the effect of mobility 9 and 10 periods ago, and a few other coefficients in columns (3). This suggests that the relationship becomes weaker over time. The lower significance levels in columns (3) are no reason to be overly alarmed because this is the specification stratified by SNI-codes and the resulting drop in used observations (ca 300,000 instead of over 575,000). Columns (2) and (4) differ in that the former has observation year dummies and an age variable included (instead of birth year strata), and the latter replicates specification (1) but with controls for years in administration and middle management included. All estimates are very robust to these variants. All in all, the results suggest that department hopping and doing a round in the revolving doors is indeed positively associated with becoming an SGO during the years of the study.

The hazard ratios of the control variables reveal some corollary findings: As one would expect, a higher average share of full-time work performed in the last ten years is positively related to chances of success. Specifically, a one percentage point increase in share of full-time is associated with an enhanced chance of becoming an SGO by roughly 2% (except in column 3).¹⁸ The cumulative years of middle management experience

¹⁸ This 'effect' may well work through a low-ambition signalling mechanism.

also exhibits a positive relationship in all specifications and both tables. While not very surprising, the link between how middle management and how top management positions are reached should receive further attention in future research based on this data. The general administrative experience seems to be negatively correlated with later success (although the estimates are insignificant in Table 4). This may reflect the earlier finding from the descriptive statistics whereby future SGOs seemed to have faster careers. The fact that no unambiguous effects of immigrational background can be found may surprise some, but the lack of statistical significance most likely stems from the low number of cases. Finally, the hazard ratio on gender is above one, in line with the descriptive evidence presented above.

The final two columns in each table have the five lagged career variables replaced by the single cumulative one. Clearly, the positive associations of the cumulative indicators in Tables 3 and 4 reflect the overall findings from columns (1) to (4). This is important because the cumulative variables are then used to estimate both effects jointly in Table 5. As can be seen there, the main findings are confirmed even when the cumulative intra-government and revolve variables are included jointly.¹⁹ The coefficients of the first two variables are above one and highly significant throughout. This seems to be stable across various model specifications including the industry strata in column (3). Corollary results such as the positive association of middle management experience and the slight negative effect of time spent working in administration also hold up. All in all, the joint estimations using the cumulative variables confirm all previous findings.

4.3. Results based on pure entrant sample

So far all results were based on a vast amount of observations, but there was a price to pay for using so much information. For a large share of individuals in the sample the start of their government career remained eclipsed—the data is left-truncated. This section presents a robustness check to rule out the possibility that the results are influenced by this problem. The strategy is simply to replicate the findings with a much more selective—and thus more homogeneous—sample than the one used so far. To do this, first a subsample of pure entrants into the civil service is drawn. Using the classification for non-truncation from above (recall that spells are non-truncated if there is no government employment in 1985, 86, and 87), only such individuals are retained. Second, the additional requirement is imposed that the estimated entry into professional life must lie less than seven years before entry into the civil service. This is to keep out very

¹⁹ The joint results are reported only with the cumulative career history variables mainly for ease of presentation. Including both sets of lagged variables yields analogous results.

experienced hires. The new sample is substantially smaller, now only containing 6,335 individuals who—by definition—are at earlier stages in their careers and therefore are expected to have lower transition rates into higher offices. Only 30 of them are observed to ‘fail’. A clear sign that the sample is more homogenous is the fact that now the maximum age upon entry into the administration is only 32 while it was 64 previously (refer back to Table 1).

Table 6: Lagged mobility incidents before becoming SGO (pure entrants vs full sample)

| (figures in percent) | Lags 1,2 | Lags 3,4 | Lags 5,6 | Lags 7,8 | Lags 9,10 |
|---|----------|----------|----------|----------|-----------|
| <i>Intra-Governm. Mobility</i> | | | | | |
| Intra-Gov Change (Entrants) | 16.67 | 20.00 | 13.33 | 13.33 | 10.00 |
| Intra-Gov Change (All) | 10.15 | 9.85 | 8.00 | 9.23 | 8.00 |
| <i>Mobility from Other Sectors</i> | | | | | |
| Revolve (Entrants) | 33.33 | 40.00 | 30.00 | 43.33 | 23.33 |
| Revolve (All) | 19.69 | 20.92 | 24.92 | 31.69 | 15.69 |

A first glance at the data suggests left-truncation is of minor importance for our main conclusions. Table 6 displays the main lagged career variables for all SGOs in the ten periods prior to attaining SGO-status. It can be seen that the share of individuals for which these dummy variables take the value one (i.e. they changed x or y periods ago) is higher in the pure entrant sample throughout. Thus, the effects found above may turn out to be even stronger in the entrant sample. However, as a comparison of the two samples along the career variables and previous-period positions shows, the two samples also differ in many other ways (see Tables 9 and 10 in the Appendix) and we therefore re-run the key specifications on the restricted sample. The results are reported in Tables 11 and 12 in the Appendix; the structure of the tables is the same as of those discussed above.²⁰ They reveal that some of the previous results are less precisely estimated, but none vanish. Specifically, in Table 11 of the individually lagged intra-governmental mobility variables all but one (lag 5,6 in column 4) retain a value above one, and in Table 12 it is all of them up to lag 7,8. The smaller sample size slashes significance levels, however, with now only just under half of the individually lagged hazard ratios

²⁰ The results of estimating the two effects jointly using the cumulative variables are available on request. They bear no surprises.

reaching a conventional level of precision. But this appears to be mainly due to larger standard errors and not due to smaller point estimates. Notably, all the results hold up when the cumulative variables are used, and the same is true when the effects are estimated jointly (results not reported). All in all this can be viewed as a confirmation of the previous results because the restrictions imposed to create the entrant sample were very strict.

Previous versions of the paper also contained the estimates based on the entrant sample using discrete-time logit models. The results all hold up with only some dropping by one significance level, and the magnitudes of the estimated hazard ratios are very close to the Cox estimates presented here.

5. Identifying the mechanism: skill acquisition or signalling

Table 7: Shares of employees by mobility incidents and education level (all and later SGOs)

| (in percent except totals) | Upper Secondary (1) | Short Tertiary (2) | Long Tertiary (3) | Postgrad or PhD (4) |
|----------------------------|---------------------------|--------------------------|-------------------------|---------------------------|
| <i>All</i> | | | | |
| Number of Individuals | 20,820 | 3,101 | 19,390 | 1,133 |
| Zero mobility | 96.00 | 93.94 | 90.95 | 94.44 |
| One mobility incident | 3.48 | 4.90 | 6.89 | 4.32 |
| Two mobility incidents | 0.47 | 1.03 | 1.72 | 0.97 |
| Three or more | 0.06 | 0.13 | 0.44 | 0.26 |
| <i>Later SGOs</i> | | | | |
| Number of Individuals | 16 | 7 | 261 | 41 |
| Zero mobility | 43.75 | 85.71 | 58.24 | 73.17 |
| One mobility incident | 43.75 | 14.29 | 25.29 | 17.07 |
| Two mobility incidents | 12.50 | 0.00 | 14.18 | 7.32 |
| Three or more | 0.00 | 0.00 | 2.30 | 2.44 |

The results of the foregoing section provide good evidence for the hypothesis that career patterns of an individual dating back up to ten years have relevant predictive power for his or her chances of becoming very successful in the Swedish government hierarchy. The natural question to ask now is ‘why?’. Why are intra-governmental

Table 8: The mobility-success link: HCR or signalling (Cox)

| | (1) | (2) | (3) | (4) |
|------------------------------------|-----------------------|-----------------------|---------------------|-----------------------|
| Cumulative Intra-Gov Changes | 2.847*** (0.724) | 3.077*** (0.701) | 2.253*** (0.659) | 3.289*** (0.815) |
| Cum Intra-Gov Changes × Higher Edu | 0.626* (0.163) | 0.582** (0.137) | 0.561* (0.168) | 0.539** (0.137) |
| Years in Administration | | | | 0.890*** (0.0194) |
| Years in Middle Management | | | | 1.485*** (0.0271) |
| Share Full Time | 1.022*** (0.00790) | 1.022*** (0.00787) | 1.003 (0.00827) | 1.020*** (0.00695) |
| Immigrant | 0.938 (0.220) | 0.878 (0.205) | 1.183 (0.288) | 1.020 (0.240) |
| Male | 1.391*** (0.171) | 1.352** (0.166) | 1.774*** (0.227) | 1.082 (0.135) |
| Edu Short Tertiary | 4.993*** (2.854) | 2.904* (1.670) | 4.685*** (2.711) | 3.661** (2.087) |
| Edu Long Tertiary or Higher | 21.17*** (8.796) | 5.436*** (2.606) | 14.83*** (6.190) | 13.19*** (5.472) |
| Education Field Dms | Yes | Yes | Yes | Yes |
| Observation Year Dms | | Yes | | |
| Birth Year / Age | Strata | Age | Strata | Strata |
| Orga SNI Codes | | | Strata | |
| Observations | 576,878 | 576,878 | 304,556 | 576,878 |
| Subjects | 44,444 | 44,444 | 44,444 | 44,444 |
| Failures | 325 | 325 | 325 | 325 |

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

job mobility but also other organization changes associated with future career success? Which mechanism(s) might drive these results? As discussed earlier, the two main rivalling theories within personnel economics are a) human capital acquisition, whereby holding a number of different posts in various departments or the private sector has a positive experience and learning effect, and b) some form of ability signalling where departmental mobility may signal the ability and career commitment of an employee to his or her superiors and other decision makers in the internal labour market, who are then more apt to promote him or her.²¹

Some clues how to empirically differentiate between the two channels can be found in the existing literature. Building on an idea by Waldman (1984), Bernhard (1995) presents a model of intra-firm promotions where employee talent is initially unknown but revealed over time. Importantly, ability is revealed only to the current employer while other firms in the economy do not receive these signals. What everyone observes, however, is if an individual is promoted in any other firm. Bernhardt identifies two effects in this setting: First, despite it being optimal to assign able employees to higher-level jobs, firms may find it optimal to under-promote employees in order to hide their ability from the outside market. Second, at the same time it is optimal to fast track (i.e. over-promote) the better employees who have already been promoted once because their talent is revealed in any case, and further promotions are needed to prevent them from leaving. Building on this argument, DeVaro and Waldman (2007) show that signalling-based fast track effects should be weaker for individuals with higher education because education is a valid ability signal that is observable to everyone. Specifically, they show that the wage premium associated with promotions should be lower for more educated employees, and they provide some empirical support for this hypothesis. A related test is conducted by Belzil and Bognanno (2004) who find that the (small) fast track effects they identify for executives of 380 US firms are less pronounced for employees with higher education and longer firm tenure. They write “the magnitude of the individual specific effect of achieving a higher speed of promotion is inversely related to accumulated human capital; [...] these findings are consistent with the hypothesis that the signaling aspect of past promotions is stronger for those who are relatively new in a firm” (8).

Inspired by these approaches, we conduct a test based on a similar argument, which is applicable to the particular context of this paper where the link of interest is between past *mobility* and promotion. First note that the incidents of mobility (that we observe) are different in nature from past promotions (which the other papers focus on) in that

²¹ A third possibility are of course networks, which arguably expand with increased mobility and enhance career chances, but for reasons of scope the paper cannot deal with this channel in greater detail.

employees have much more influence over changing between jobs and organizations than over their own promotions. It is therefore appropriate to interpret past mobility as an often voluntary ‘career move’ by the employee—at least much more so than his or her past promotion speed.²² Now, suppose that formal and thus observable education is (at least imperfectly) a valid signal for ability, and suppose also that it is (at least imperfectly) an indicator of the ability of an individual to acquire human capital.²³ Then if observable career moves such as ‘departmental hopping’ only have a signalling effect but *no* human capital accumulation effect, better educated employees have less of an incentive to be mobile relative to less educated employees. This is assuming that the two ability signals are at least partial substitutes for each other. In turn, if inter-organizational mobility primarily has an human capital accumulation effect but no signalling effect, and supposing that observable education proxies for the ability to acquire human capital on various posts, then highly educated employees have a higher incentive to undertake career moves than less educated employees (because the return on changing jobs is greater).

A related argument could also be made from the employer’s point of view, which is again more in line with the reasoning of DeVaro and Waldman: If department hopping is a credible (because costly) signal of ability and career commitment that an employee can send to her employer, then employers may respond more strongly to such signals from less educated employees because they carry more additional information.

In any case, both arguments generate the following testable prediction: The coefficients of the interaction terms between the mobility variables and the dummies for higher education should point in the opposite direction than the non-interacted mobility variable. More concretely, since mobility and success are positively associated, one would expect the hazard ratio of mobility interacted with high education to be below one. To test this hypothesis, the cumulative intra-governmental mobility variable as well as the complete set of lagged mobility variables are interacted with a dummy for any higher university degree.²⁴ Then the key regressions are re-run.

But before turning to those results, a first glance at mobility incidents and educational attainment is worthwhile. For each educational level, Table 7 shows the shares of indi-

²² Changes due to organizations ceasing to exist are extremely rare in our data, which is unfortunate for various other interesting research designs.

²³ A standard assumption in many seminal models, such as Spence (1973).

²⁴ Note that there are theoretical reasons why we only carry out these tests with the intra-administrative mobility variable: The transferability of human capital gained in the private sector to the government sector is less clear than within the administration. Similarly, the signal content of an incident of external mobility is likely to be much less clear; for example, well-educated workers who move from the private to the public sector may seek a quieter life.

viduals that have had zero, one, two, or ‘three plus’ mobility incidents over the previous ten years (always as a percentage of all individuals with the respective educational level). The bottom part of the table shows the same information only for those who later become SGOs. The main insight from Table 7 is that the shares of employees with more mobility incidents tends to be higher among the better educated. And the shares become even higher if one only looks at those who later become SGOs. For example, while less than half a percent of all those with long tertiary or postgraduate education had two, three or more mobility incidents, it is nearly 2.5% among the later SGOs. So *a priori* a lot suggests that mobility, education, and later career success all go hand in hand. The following multivariate duration models allow to draw a more differentiated picture.

Table 8 shows the Cox model specifications in which the cumulative mobility variables are interacted with the higher education dummies, in addition to all variables that were included above (some not reported). The second line in Table 8 speaks a fairly clear language. In all specifications the coefficient on past incidents of mobility interacted with the highest educational levels is below one and statistically significant, suggesting that the link between mobility and future career success is significantly weaker for individuals with higher education. We have also verified that the results hold for a model where each independent lagged mobility variable is interacted with the high education dummy. The estimates are consistently less than one, and the dummies down to $t - 4$ are significant in all our main specifications (results available on request).

Our results thus show that mobility is a better predictor of future success for the less educated. Although this is far from ironclad proof in favor of the signalling hypothesis, our interpretation—based on the assumption of signal substitutability—is that it is indicative of signalling as an important driver of the positive effects found in the main analysis. An alternative explanation would be that more educated people have more specialist careers and therefore, once committed to a department or subject area, advance quickest by staying and acquiring skill within the organization dealing with the issues related to their expertise, whereas less educated workers may benefit more from on-the-job learning and therefore find it worthwhile to move around. We have tried to analyze this hypothesis using coarse indicators for the degree of educational specialization but could not find any evidence of such effects; it should be acknowledged, though, that the data are far from ideal for this exercise. One other possibility we cannot rule out completely is that there are interactions between the organizations’ (informal) hierarchy of prestige and their recruitment. For example, highly educated workers may be able to enter ‘fast track’ organizations earlier in their career. The fact that the interaction between mobility and education is insensitive to the use of SNI-code strata (column 3), which

control for variation along several subcategories within the government administration, does speak against this hypothesis to some degree.

6. Conclusion

This paper studies job mobility in the Swedish government administration in the last two decades. Based on a statistical analysis of data capturing 24 years of the career progression of around 44,000 Swedish civil servants, we find that Swedish government is best characterized as a *permeable internal labour market*. Around 75% of all middle and 80% of top managers are being recruited from within the core administration of government, and 70% come from within the very same organization where they are (first) appointed middle or top-manager. But recruitment from and interchange with other sectors is clearly present, too. Interestingly, interchange with the actual (commercial) private sector is of least importance: Only 2.5% of middle and 1.23% of senior officials work in the private sector immediately before attaining the respective level for the first time. In Sweden a ‘revolving doors’ instead mainly seems to exist between the administration and sectors such as interest groups, NGOs, local government, and public organizations that are not part of the core administration.

The second part of the paper links mobility-related characteristics in civil servants’ past careers to future success. Cox models are used to explain the incident of an individual first reaching the status of a senior government official (SGO)—which only around 0.7% of all civil servants in our sample reach—while controlling for a wide range of confounding factors. The results reveal that intra-administrative job mobility and interchanges between other sectors and the administration are positively associated with the chances of later becoming an SGO.

The results are consistent with labour economics theories suggesting that changes of organization either help individuals to gain experience and skills that qualify them for future leadership functions (human capital acquisition), and/or let them send a credible (because costly) signal of ability and career commitment to decision makers at the internal labour markets. Both mechanisms can imply higher promotion chances and thus higher overall success rates. In an attempt to discriminate between the two channels we document that that the positive effects of mobility are larger for civil servants with less formal education, which is consistent with a signalling interpretation if the signals of education and mobility are partially substitutable, as has been argued in the existing literature.

Our findings of a positive relationship between incidents of job mobility and career

success, and the evidence suggesting that an informational signalling mechanism rather than human capital acquisition may drive the results, raises concerns that leadership selection and career incentives in government-internal labour markets may create distortionary incentives for younger employees. If young and eager administrators implicitly or explicitly understand that ‘department hopping’ gets them up the hierarchical ladder, they have an incentive to do so irrespective of whether this helps the organization as a whole or even whether they advance the skills they need. In the worst case changing jobs too often becomes an individually *career optimizing* but overall harmful activity, as suggested by Brösamle (2010). Although our analysis points in this direction, it should be acknowledged that we cannot establish the existence of such distortions as a hard fact, among other reasons because our data does not include individual’s performance ratings and because we are unable to disentangle to what extent mobility patterns are due to choice versus constraint. The results do however suggest that implicit incentive structures and career concerns may be as important for the mobility choices of civil servants as it has been found to be for employees in private sector companies—a feature which is well-documented in the personnel economics literature on internal labor markets.

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A. Appendix with additional statistical tables

Table 9: Career characteristics at different career stages: entrant sample versus initial sample, cumulative over 10 previous years, by later success

| Stats for Individuals entering | 1st Gov Employment | | | 1st Middle Mmnt Position (ssyk1) | | | SGO (ssyk111) |
|---|--------------------|-------------------|-------------------|----------------------------------|-------------------|-------------------|--------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | All Individuals | Later SGO | Later no SGO | All Individuals | Later SGO | Later no SGO | All Individuals |
| Entrant Sample | | | | | | | |
| <i>Time Worked in Different Sectors</i> | | | | | | | |
| Years Worked in Administration | 1.00 [†] | 1.00 [†] | 1.00 [†] | 8.01 | 6.80 | 8.17 | 7.13 |
| Years Worked in Private Sector | 1.07 | 2.25 | 1.07 | 0.38 | 0.47 | 0.37 | 0.43 [‡] |
| Years Worked in Capital | 1.55 | 2.75 | 1.55 | 4.83 | 8.47 | 4.36 | 8.63 |
| Years Worked in Other Employment | 0.68 | 1.75 | 0.68 | 1.00 | 1.70 | 0.91 | 1.60 [‡] |
| Years Worked in Middle Mmnt | n/a | n/a | n/a | 1.00 [†] | 1.00 [†] | 1.00 [†] | 1.47 |
| Initial Full Sample | | | | | | | |
| <i>Time Worked in Different Sectors</i> | | | | | | | |
| Years Worked in Administration | 1.00 [†] | 1.00 [†] | 1.00 [†] | 8.58 | 6.76 | 8.80 | 7.62 |
| Years Worked in Private Sector | 2.19 | 1.14 | 2.20 | 0.35 | 0.34 | 0.35 | 0.28 |
| Years Worked in Capital | 2.56 | 5.24 | 2.54 | 4.74 | 8.13 | 4.35 | 7.50 |
| Years Worked in Other Employment | 2.71 | 5.95 | 2.68 | 1.14 | 2.21 | 1.01 | 1.80 |
| Years Worked in Middle Mmnt | 0.01 [§] | 0.24 [§] | 0.01 [§] | 1.00 [†] | 1.00 [†] | 1.00 [†] | 3.38 |

[†]) Figures are measured end of period, thus they are all one.

[‡]) Figures may well be lower than those two columns to the left because of 10 year moving window.

[§]) These very low shares arise from those few entrants who start as a middle managers right away.

Table 10: Positions before entering different career stages: entrant sample versus initial full sample, by later success

| Stats for Individuals entering | 1st Gov Employment | | | 1st Middle Mmmt Position (ssyk1) | | | SGO (ssyk111) |
|---|--------------------|--------------|-----------------|----------------------------------|--------------|-----------------|--------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | All Individuals | Later SGO | Later no SGO | All Individuals | Later SGO | Later no SGO | All Individuals |
| Entrant Sample | | | | | | | |
| <i>Sector in Previous Period (shares)</i> | | | | | | | |
| Worked in Administration | n/a | n/a | n/a | 77.99 | 73.33 | 78.57 | 83.33 |
| Worked in Private Sector | 15.75 | 10.00 | 15.78 | 1.87 | 3.33 | 1.68 | n/a |
| Worked in Capital | 21.82 | 60.00 | 21.64 | 48.88 | 90.00 | 43.70 | 93.33 |
| Worked in Other Sector | 19.16 | 53.33 | 19.00 | 12.31 | 10.00 | 12.61 | 10.00 |
| Worked in Middle Management | n/a | n/a | n/a | n/a | n/a | n/a | 16.67 |
| <i>Mobility Incident Previous Period (shrs)</i> | | | | | | | |
| Revolved into current Position | 100.00 | 100.00 | 100.00 | 22.01 | 26.67 | 21.43 | 16.67 |
| Intra-Gov Change into cur Pos | n/a | n/a | n/a | 5.60 | 6.67 | 5.46 | 3.33 |
| Changed Orga into cur Position | 74.05 | 93.33 | 73.95 | 15.67 | 20.00 | 15.13 | 10.00 |
| Initial Full Sample | | | | | | | |
| <i>Sector in Previous Period (shares)</i> | | | | | | | |
| Worked in Administration | n/a | n/a | n/a | 73.55 | 59.54 | 75.01 | 80.00 |
| Worked in Private Sector | 14.16 | 5.96 | 14.24 | 2.52 | 1.97 | 2.57 | 1.23 |
| Worked in Capital | 13.27 | 41.23 | 13.06 | 37.98 | 66.77 | 35.02 | 73.85 |
| Worked in Other Sector | 20.07 | 44.92 | 19.89 | 13.81 | 15.38 | 13.65 | 5.23 |
| Worked in Middle Management | n/a | n/a | n/a | n/a | n/a | n/a | 32.92 |
| <i>Mobility Incident Previous Period (shrs)</i> | | | | | | | |
| Revolved into current Position | 51.30 | 67.08 | 51.18 | 24.39 | 37.85 | 23.01 | 20.00 |
| Intra-Gov Change into current Position | n/a | n/a | n/a | 5.82 | 10.46 | 5.34 | 9.23 |
| Changed Orga into current Position | 33.92 | 43.38 | 33.85 | 17.34 | 30.15 | 16.02 | 18.77 |

Table 11: Intra-governmental changes and career success: entrant sample only (Cox)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|-------------------------------|--------------------|--------------------|--------------------|---------------------|---------------------|---------------------|
| Intra-Gov Changes $t - 1, 2$ | 2.932** (1.602) | 2.683* (1.443) | 1.030 (0.566) | 3.426** (2.083) | | |
| Intra-Gov Changes $t - 3, 4$ | 3.810** (1.987) | 3.536** (1.816) | 2.446 (1.335) | 2.374 (1.425) | | |
| Intra-Gov Changes $t - 5, 6$ | 1.301 (0.786) | 1.783 (1.019) | 1.299 (0.907) | 0.679 (0.505) | | |
| Intra-Gov Changes $t - 7, 8$ | 2.821* (1.623) | 2.676* (1.519) | 2.301 (1.738) | 1.310 (0.990) | | |
| Intra-Gov Changes $t - 9, 10$ | 5.451** (3.706) | 4.548** (2.999) | 3.410 (3.065) | 1.033 (1.073) | | |
| Cumulative Intra-Gov Changes | | | | | 2.191*** (0.353) | 1.498** (0.302) |
| Years in Administration | | | | 0.991 (0.0886) | | 1.004 (0.0882) |
| Years in Middle Management | | | | 2.951*** (0.503) | | 2.751*** (0.416) |
| Share Full Time | 1.017 (0.0276) | 1.023 (0.0297) | 1.012 (0.0438) | 1.011 (0.0322) | 1.018 (0.0269) | 1.013 (0.0332) |
| Immigrant | 1.197 (0.967) | 1.416 (1.050) | 1.566 (1.272) | 0.973 (0.846) | 1.120 (0.874) | 1.104 (0.920) |
| Male | 2.162* (0.858) | 2.083* (0.819) | 2.575** (1.148) | 1.355 (0.590) | 2.027* (0.805) | 1.349 (0.593) |
| Edu Short Tertiary | 0.655 (0.836) | 0.231 (0.321) | 1.368 (1.919) | 0.578 (0.764) | 0.650 (0.831) | 0.614 (0.806) |
| Edu Long Tertiary or Higher | 2.488 (2.095) | 0.364 (0.497) | 3.352 (3.431) | 2.209 (1.934) | 2.543 (2.131) | 2.265 (1.980) |
| Education Field Dms | Yes | Yes | Yes | Yes | Yes | Yes |
| Observation Year Dms | | Yes | | | | |
| Birth Year / Age | Strata | Age | Strata | Strata | Strata | Strata |
| Orga SNI Codes | | | Strata | | | |
| Observations | 83,099 | 83,099 | 33,909 | 83,099 | 83,099 | 83,099 |
| Subjects | 6,335 | 6,335 | 6,335 | 6,335 | 6,335 | 6,335 |
| Failures | 30 | 30 | 30 | 30 | 30 | 30 |

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 12: Revolving doors and career success: entrant sample (Cox)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Revolve $t - 1, 2$ | 3.318*** (1.359) | 3.646*** (1.470) | 2.050* (0.889) | 4.338*** (1.915) | | |
| Revolve $t - 3, 4$ | 3.350*** (1.332) | 2.986*** (1.188) | 2.078 (0.930) | 5.327*** (2.343) | | |
| Revolve $t - 5, 6$ | 1.585 (0.734) | 1.676 (0.744) | 1.151 (0.574) | 2.222 (1.116) | | |
| Revolve $t - 7, 8$ | 1.473 (0.706) | 1.867 (0.827) | 1.133 (0.638) | 1.521 (0.782) | | |
| Revolve $t - 9, 10$ | 0.580 (0.325) | 0.690 (0.347) | 0.673 (0.441) | 0.283* (0.185) | | |
| Cumulative Revolve | | | | | 2.275*** (0.512) | 2.634*** (0.609) |
| Years in Administration | | | | 1.225* (0.138) | | 1.091 (0.103) |
| Years in Middle Management | | | | 3.371*** (0.532) | | 3.272*** (0.506) |
| Share Full Time | 1.027 (0.0342) | 1.031 (0.0353) | 1.031 (0.0494) | 1.020 (0.0465) | 1.030 (0.0369) | 1.019 (0.0440) |
| Immigrant | 1.113 (0.936) | 1.375 (1.039) | 1.387 (1.167) | 0.916 (0.854) | 1.115 (0.898) | 0.886 (0.827) |
| Male | 2.929*** (1.205) | 2.961*** (1.208) | 3.419*** (1.581) | 2.373* (1.097) | 3.099*** (1.287) | 2.397* (1.103) |
| Edu Short Tertiary | 0.787 (1.003) | 0.250 (0.346) | 1.308 (1.770) | 0.817 (1.072) | 0.816 (1.039) | 0.888 (1.155) |
| Edu Long Tertiary or Higher | 3.706 (3.119) | 0.382 (0.526) | 3.048 (2.949) | 3.324 (2.905) | 3.386 (2.846) | 2.928 (2.598) |
| Education Field Dms | Yes | Yes | Yes | Yes | Yes | Yes |
| Observation Year Dms | | Yes | | | | |
| Birth Year / Age | Strata | Age | Strata | Strata | Strata | Strata |
| Orga SNI Codes | | | Strata | | | |
| Observations | 83,099 | 83,099 | 33,909 | 83,099 | 83,099 | 83,099 |
| Subjects | 6,335 | 6,335 | 6,335 | 6,335 | 6,335 | 6,335 |
| Failures | 30 | 30 | 30 | 30 | 30 | 30 |

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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