Pay or Performance?
Retaining Emotionally Stable Police Officers*

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Abstract

Growing evidence shows that 1) police officer performance differs by personal characteristics, and 2) many countries are struggling to retain officers. How do different types of officers respond to different retention strategies? We study this using detailed Swedish data that include officers' emotional stability (as measured in military enlistment assessments). Using geographic shocks to outside options, we show that higher relative pay increases retention, but especially so for less emotionally stable officers. Using exogenous manager turnover in the midst of organizational crisis, we show that more stable management also increases retention, particularly for more emotionally stable officers. These results suggest that strategies for increased officer retention can vary in their effects on the composition of the police force.

Keywords: Public sector management, Police, Non-cognitive skills. **JEL Classification Numbers:** J450, K420, M520.

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1 Introduction

Policing and effective law enforcement are fundamental tasks of a state. Weber (1946) famously defined a state as a community with a monopoly on the legitimate uses of violence, which means that a police force is the defining characteristic of a state. Signs of growing concern about police conduct and their fraught relationships with certain citizens – particularly in minority communities – are therefore concerning because they risk undermining broader trust in government and engagement with the state. Of course, growing evidence suggests that not all officers are equal, even within a fixed institutional setting. Officers with different characteristics, such as gender, minority status, or years of experience, perform differently in terms of use of force (Ba et al., 2021, 2022; Hoekstra and Sloan, 2022), obtrusive traffic stops (Antonovics and Knight, 2009; Goncalves and Mello, 2021; Shoub et al., 2021), community engagement, and crime reporting (Holgersson and Knutsson, 2012; Miller and Segal, 2019), and handling sensitive cases (Ponce de Leon, 2024). This evidence shows that the characteristics of police officers are important determinants of their performance.

In light of this, how might policymakers shape the composition of officers in their police force? A natural question is how they can attract and recruit promising individuals, but it is equally important to retain experienced individuals. This is particularly true in policing, where more experienced officers tend to perform better (Ba et al., 2021), and where governments incur large upfront training costs. With this in mind, it is concerning that many countries are seeing increased exits from policing.[1] Our focus is on Sweden, where a controversial 2015 reform almost tripled the police officer exit rate.

In this paper, we study how police officer retention is affected by changes in relative pay and management performance. These two factors have received considerable attention in Swedish police debates (Cameron, 2017) and more broadly, they have been identified as important determinants of worker retention in both the public and private sectors. Our goal is to assess not only how these policy levers affect retention, but also which types of officers respond, and therefore how they affect the composition of the police force. To do so, we use population-wide administrative data on workers and firms, which allow us to track wages and employment histories of exiting police officers. We link these to detailed psychological assessments of all men made by the Swedish military at conscription. These evaluations aim to measure young men's ability to cope with stressful and intense situations, which is immediately relevant for the police officer profession. We focus primarily on measures of *emotional stability*, which we see as a key determinant of officer performance and healthy

[1] Grunwald (2024) and Adams, Mourtgos, and Nix (2023) study the United States, and Terpstra and Fyfe (2015) show increased exits in the Netherlands and Scotland in response to reforms there.

community engagement. Using a long-standing survey of voter attitudes,[2] we provide descriptive evidence that police units with a higher share of emotionally stable officers are associated with higher citizen trust in the Police.

We begin by organizing our analysis with a simple conceptual framework that builds on Dal Bó, Finan, and Rossi (2013), who ask whether higher wages attract more or less public service-motivated people into the public sector. Raising wages has two effects. Intuitively, it can attract individuals who are less intrinsically motivated and care more about wages. At the same time, however, if intrinsically motivated workers tend to have better outside options, then the marginal worker attracted by higher public sector wages might actually be *more* intrinsically motivated. The importance of these two channels depends on the strength of the correlation between workers' innate characteristics and their outside options. In the context of Dal Bó, Finan, and Rossi (2013) (college-educated community development agents in rural Mexico), this correlation is sufficiently strong that higher wages bring applicants who are more public service-motivated. Still, there is no reason to expect this finding to generalize across all contexts. We explore empirically whether a similar result holds among police officers in Sweden, for the case of emotional stability as a personality trait.

To generate variation in the relative pay within policing, we construct *Bartik shocks* from differences across time and space in labor demand in other industries, i.e., variation in police officer outside options.[3] Consistent with rigid public sector wage setting, we find that police officers' salaries do not respond to variation in outside options, unlike the literature using similar identifying variation to study private sector wages (Beaudry, Green, and Sand, 2012; Caldwell and Danieli, 2024). Improvements in outside options thus reduce the *relative* pay for police officers, and consistent with a large literature estimating separations elasticities (Dube, Giuliano, and Leonard, 2019; Sokolova and Sorensen, 2021; Bassier, Dube, and Naidu, 2022), we find that this leads to a significant increase in worker exits.

Importantly, however, exit rates differ across worker personality traits. Improved outside options lead police officers with below-median emotional stability to quit, while exits among officers with above-median emotional stability do not respond.[4] As a result, while more generous pay would increase total retention, it would also reduce the average emotional

[2]The SOM Institute Cumulative Dataset 1986-2023 (University of Gothenburg, SOM Institute, 2025).

[3]Relative to the standard Bartik instrument (Bartik, 1991; Bound and Holzer, 2000; Notowidigdo, 2020), we adapt shocks to account for the observed distribution of the sets of industries that exiting officers transition into. As we show below, officers are highly concentrated in a small set of specific industries. Because of this, our "shock" reflects a fairly specific shock to officers' outside options rather than a general economic shock.

[4]Throughout the paper, we split officers based on whether their emotional stability scores are above or below the median *within policing*. As we show below, the distribution of emotional stability among police officers is much higher than among the full population, so it is wrong to think of below-median officers as having *low* emotional stability, and we therefore always refer to them as "non-high" emotional stability.

stability of the police force by *differentially* retaining less stable officers. In interpreting this result, it is important to keep in mind that emotional stability (like other non-cognitive and social/emotional traits) is valuable in the labor market (Edin et al., 2022), and indeed, we show that it generates higher returns outside of, rather than within, policing. Thus, it is plausible that emotionally stable individuals who select into policing are particularly motivated by the mission of public safety.

To consider management, we focus on a particularly important period: 2014-2018. In 2013, an all-government commission introduced a reform to dramatically centralize decision-making within the Swedish police. Before this, Sweden's National Police Authority gave almost complete independence and operational autonomy to each of Sweden's 21 counties. The heart of the reform was in shifting administrative (e.g., human resources, hiring, and budgeting) responsibility from decentralized county offices into one national administrative structure. Investigative tasks were also centralized, partly to the seven newly created Policing regions and partly to the national level, with the goal of increased efficiency and uniform operations across the country (see Riksrevisionen, 2025, for a detailed description of the reform goals).[5]

This reform proved extremely controversial and prompted a remarkable level of negative media coverage. Officers were clearly frustrated by administrative inefficiencies, organizational dysfunction, and management problems caused by the centralization of decision-making and the decrease in local control over operational decisions, like hiring and patrolling officer task assignment. From the officers' perspective, the organization suddenly became 20 times as large, and, unsurprisingly, this reduces a certain amount of flexibility and responsiveness to local needs and conditions. We show that the aggregate separations rate for officers tripled after the reform. Consistent with this being a nationwide shock, this increase was shared across all regions of the country and officers with all levels of experience.

Our empirical strategy observes that a key part of what effective managers do is respond to shocks (Aghion et al., 2021; Adhvaryu et al., 2022; Diaz et al., 2025). In the midst of a crisis, good managers can mitigate emergent challenges but also improve the morale of their workers. In such a situation, the turnover of a leader can be disruptive. We leverage cross-sectional variation in the pre-reform age of the manager, combined with Swedish retirement rules. Focusing on the top-level management within municipalities (the key policing units) during the last year before the crisis, we show that municipalities with a 63-year-old manager

[5]The proposed reform also aimed to increase police presence in remote or rural areas (Cameron, 2017), and anecdotally, postings to remote parts of Sweden have been controversial among officers (Grahn, 2012). We find no evidence that shifts in the allocation of officers contributed to increased separations. If anything, there has been a shift of officers towards municipalities with lower separations rates, but the overall geographic reallocation of officers has been very small.

were discontinuously more likely to experience manager retirement during the 2014-2018 retention crisis. We ask how manager retirement (an inherently disruptive event) affected the retention of other officers.

We find that separations increased more in municipalities that experienced leader turnover during the crisis, even relative to municipalities with only slightly younger managers. Interestingly, the marginal increase in exits induced by this leadership turmoil is entirely concentrated among highly emotionally stable officers. One interpretation, consistent with both anecdotes of officers' objections to the reform and with our finding that such officers respond less to relative pay, is that these officers are more intrinsically motivated by the public safety mission of policing, and are therefore more sensitive to disruptions that inhibit that mission.

Together, these results show that the Swedish government could increase the retention of experienced officers either by raising their pay or by improving some of the management problems caused by the reform.[6] However, the marginal officer retained by these two strategies is very different, with management improvements leading to a more emotionally resilient police force, compared to pay increases.

Related literature.

Our results contribute to several literatures across academic fields. In terms of police performance, a large literature has shown differences in police performance between officers with different characteristics (Antonovics and Knight, 2009; Holgersson and Knutsson, 2012; Ba et al., 2021, 2022; Goncalves and Mello, 2021; Hoekstra and Sloan, 2022; Shoub et al., 2021; Ponce de Leon, 2024). We build on this evidence by studying key personality characteristics from evaluations explicitly assessing psychological suitability for armed military service, where we see strong parallels with policing.

Our focus on the trait of emotional stability is motivated by evidence showing that more emotionally stable individuals bring benefits to policing services. Dube et al. (2024) and Owens et al. (2018) show that training programs meant to increase the cognitive ability to deal with stressful and confrontational situations reduce officer use of force and wrongful arrests. Studying militarization of US police units, Masera (2021) shows that equipping officers with heavy arms rather than reasoning skills increases fatal killings by the police. From a survey with police managers and performance evaluations of Swedish officers, a strong

[6]Currently, the Government is attempting to roll back some key provisions of the reform, most prominently by strengthening the local community presence of officers and increasing the share of resources devoted to patrolling duty. In addition, there is ongoing work to re-delegate decision-making power from the national level back to local policing units (Ministry of Justice, 2025).

correlation emerges between emotional stability and "good" officers (Tedeholm and Sjöberg, 2021; Tedeholm, 2023).

Rather than studying the performance of officers depending on their personal characteristics, we focus on how well-defined policy levers affect the retention of employees with different qualities. The most closely related paper to ours is Saltiel and Tuttle (2025), who show that officers hired during recessions (when outside options were weaker) are less likely to accumulate disciplinary infractions throughout their career. Officer recruitment is clearly essential, but departments also care about *retaining* experienced officers, and we emphasize the differential effects of relative pay compared to management performance.

Our focus on pay and management also contributes to a large body of literature spanning both the public and the private sector. With respect to pay, previous studies emphasize the importance of public sector pay for understanding the selection of bureaucrats; see Finan, Olken, and Pande (2017) for a review. In an important contribution, Dal Bó et al. (2013) study college-educated community development agents in rural Mexico and find that higher pay disproportionately crowds in applicants who are better in terms of personal characteristics. However, as they show theoretically, this effect depends on the correlation of workers' intrinsic motivation and outside options. Thus, there is little reason to expect this result to hold across settings, and studies from different contexts have produced mixed findings (Barfort et al., 2019; Deserranno, 2019; Ashraf et al., 2020).

Our study contributes to this literature in two ways. First, we study police officers, who are critical public sector employees because of their importance for the lives of marginalized citizens and their role in shaping the relationship of all citizens with the government (Nanes, 2021). Second, we focus on retention of officers rather than selection of new officers. Considering retention alongside selection is important because many countries see workers switch between the public and private sectors throughout their careers (Chassamboulli et al., 2020; Fontaine et al., 2020; Gomes and Wellschmied, 2020), whereby entry into the public sector is not a one-time decision. In our focus on retention, our work relates to a literature on relative pay and separations in the private sector (Dube et al., 2019; Sokolova and Sorensen, 2021; Bassier et al., 2022), from which our empirical strategy draws inspiration.

It is increasingly recognized that good management improves organizational performance (Bloom, Sadun, and Van Reenen, 2010). For our purposes, four key themes from this literature are relevant. First, manager turnover leads to large shifts in organizational outcomes (Johnson et al., 1985; Bertrand and Schoar, 2003; Bertrand, 2009; Quigley et al., 2017). Second, one of the key things good managers do is retain good workers (Lazear et al., 2015; Bender et al., 2018; Hoffman and Tadelis, 2021), partly because manager leadership styles shape organizational culture (Bandiera et al., 2020; Dessein and Prat, 2022), which is valued

by workers (Gartenberg, Prat, and Serafeim, 2019; Sockin, 2022; Cai, Prat, and Yu, 2024). Third, a manager's ability to respond and adapt to shocks is important for worker productivity (Adhvaryu et al., 2022; Diaz et al., 2025). Finally, decentralized decision-making allows managers to respond to challenges as they arise (Aghion et al., 2021). Our work brings these themes together: We study exogenous manager turnover in the midst of a shock caused by the centralization of decision-making, and how this affects the retention of workers.

Studies of public sector managers are relatively limited, with important exceptions (Bloom et al., 2015; Rasul and Rogger, 2018; Banerjee et al., 2021; Fenizia, 2022). Downey and Grunwald (2025) show that managers are important for implementing controversial nationwide policy changes, and that this can affect the retention of front-line prosecutors. There is increasing interest in how turnover responds to changes in the policy direction of the government (Doherty, Lewis, and Limbocker, 2019; Richardson, 2019; Cameron and De Figueiredo, 2020; Bolton, De Figueiredo, and Lewis, 2021), whereby it is important to understand how managers exacerbate or mitigate the personnel responses to these shifts. The reform we study is one example.

2 Conceptual Framework

Here, we present a simple model to organize and interpret our empirical analyses. Each police officer is endowed with three characteristics. First, $\eta \in \{\eta_L, \eta_H\}$ refers to an officer's emotional stability. We assume this can be high or low, consistent with our empirical measurement of above/below median. That is, in our empirical analysis, we treat η as observable, at least for male police officers during most age ranges. Second, π reflects his public service motivation, which we do not observe. This is an officer's intrinsic motivation for policing as a vocation and public safety as a mission. Finally, ω is his counterfactual pay outside of policing; that is, ω is his outside option. While we cannot observe ω, we know that it is positively correlated with η (Edin et al., 2022), and our empirical strategy generates plausibly exogenous shocks to it.

Employment within policing brings two types of utility. First, officers have an intrinsic component, which reflects the amenity value they receive from pursuing policing as a career and working towards public safety. We assume that this intrinsic utility is increasing in the overall performance and effectiveness of the police force (which we denote a, and which is common for all officers) and in the officer's public service motivation (π, which differs across individuals). Second, officers receive a wage w_p. Importantly, we assume that emotional stability improves officers' performance, but that rigid pay-setting rules prevent this improvement from being passed on to wages. Appendix Table A1 shows that having high

emotional stability leads to 5% higher wages in the private sector, and only 1% higher wages among police officers.[7] Thus, we model the wage as being constant for all police officers.

In addition to their outside option wage ω, officers receive an idiosyncratic *iid* preference shock ε from taking employment outside of policing. We assume that ε follows a Gumbel distribution with location parameter 0 and scale parameter 1. As such, the Cumulative Distribution Function of ε is given by $F(x) = \exp\{-e^{-x}\}$ and its density is given by $f(x) = e^{-x}\exp\{-e^{-x}\}$.

Given these assumptions, an officer will choose to remain in policing if

$$\begin{aligned} &\pi a + w_p > \omega + \varepsilon \\ &\quad \Leftrightarrow \varepsilon < \pi a + w_p - \omega \end{aligned}$$

Thus, the probability that an officer will chose to stay in policing is given by:

$$p \equiv Pr(\text{retain}) = F(\pi a + w_p - \omega)$$

A policy-relevant comparative static is how the retention probability changes if the Police Authority raises wages:

$$\frac{\partial p}{\partial w_p} = f(\pi a + w_p - \omega)$$

Using variation in officers' wages, we could estimate this quantity. However, like many unionized public sector workplaces worldwide, wages in the Swedish police follow a fairly rigid pay schedule that offers little idiosyncratic variation to use in estimating retention effects. Instead, since police officers are stationed across the country, and shifts in outside options vary within Sweden, we can generate plausibly exogenous variation in ω. It is straightforward to see that

$$\frac{\partial p}{\partial w_p} = -\frac{\partial p}{\partial \omega}$$

Thus, in our empirical strategy, we estimate $\partial p/\partial \omega$ and use these estimates to draw conclusions about $\partial p/\partial w_p$.

Next, given our assumption that ε follows a Gumbel distribution, it is useful to note that

[7] Much of the OLS wage returns within policing are explained by management status: Managers tend to have higher emotional stability scores than officers.

we can write the elasticity of retention with respect to officer wages as:[8]

$$\begin{aligned}\nu_w &\equiv \frac{\partial p}{\partial w_p} \times \frac{1}{p} \\ &= e^{-(\pi a + w_p - \omega)} \\ &= e^{\omega - \pi a - w_p}\end{aligned}$$

How does the retention elasticity differ for highly emotionally stable officers ($\eta = \eta_H$) compared to less emotionally stable officers ($\eta = \eta_L$)? Let π_K and ω_K denote the intrinsic motivation and outside options, respectively, of K-type officers.[9] Then we can calculate the ratio of retention elasticities as:

$$\begin{aligned}\frac{\nu_w(H)}{\nu_w(L)} &= \frac{e^{\omega_H - \pi_H a - w_p}}{e^{\omega_L - \pi_L a - w_p}} \\ &= e^{(\omega_H - \omega_L) - (\pi_H - \pi_L)a}\end{aligned}$$

Both types of officers respond positively to increased wages, but whether high emotional stability officers respond by more or less than non-high officers depends on whether or not the ratio $\nu_w(H)/\nu_w(L)$ is greater than one, which, in turn, depends on whether $(\omega_H - \omega_L) - (\pi_H - \pi_L)a$ is greater than zero. This expression compares the difference in outside options by emotional stability scores with the utility value of the difference in intrinsic motivation.

Edin et al. (2022) show that non-cognitive and socio-emotional skills accrue substantial returns in the general labor market. In Appendix Table A1, we verify that this is true for emotional stability, and so $\omega_H - \omega_L > 0$. The sign of $\pi_H - \pi_L$ is not known, but if more emotionally stable officers select into policing *despite having higher paying opportunities elsewhere*, then it seems likely that $\pi_H - \pi_L > 0$, at least for the set of people who choose to work in policing, if not the full population. Thus, both terms are likely positive.

However, as the expression above shows, it is the *relative magnitude* of these terms that determines whether more or less emotionally stable officers are more responsive to pay changes. If the gap in wages is large relative to the gap in intrinsic valuations, then more emotionally stable officers will be more responsive to pay increases. On the other hand, even if there is a gap in wages, if the gap in intrinsic valuations is larger, then less emotionally stable officers will respond more to wage increases. If more emotionally stable officers care

[8] If different types of officers showed different baseline exit rates, using the elasticity could be misleading. However, empirically, they do not, so it makes little difference whether we consider the elasticity or the effect on probability in levels. Considering elasticities makes the expressions simpler and clearer.

[9] We model π and ω as deterministic functions of emotional stability. This is obviously unrealistic, but simplifies the exposition of our simple model. If these were random variables, we could still derive variations related to the *expected* retention probabilities for different types of officers.

more about the work itself, then wages matter less for their decision-making, and a wage change will have a smaller effect on them than it will for less stable officers.

What about management? We view managers as improving the ability of organizations to achieve their missions. That is, good managers improve police performance, and leadership turnover and management turmoil (particularly in the midst of an ongoing crisis) reduce the ability of the police to actually improve public safety. This is consistent with police officers' complaints about the reform. In the words of one police officer, "The police today cannot be police, there are so many administrative tasks one has to do... I think there is poor leadership inside the Police, and a new organization which takes us further away from civilians" (Radio Sweden, 2016)" (authors' translation). Even the Vice-Chair of the Swedish Police Union — which had every incentive to attribute the exits to low pay, particularly in the midst of salary negotiations in 2016 — emphasized that increased exits were due to organizational problems that made officers "feel that the reasons they went into the police are not what they can deliver today " (Radio Sweden, 2016).

Thus, we model changes in management quality as changes in a (police performance). Changes in a have particularly large effects on the utility of intrinsically motivated officers because they care more about whether the police are doing a good job. To see this, note that the retention elasticity with respect to changes in a can be written as:

$$\nu_a \equiv \pi e^{\omega - \pi a - w_p}$$

Again, we can calculate the ratio of retention elasticities to see whether more or less emotionally stable officers respond to changes in management:

$$\frac{\nu_w(H)}{\nu_w(L)} = (\pi_H/\pi_L)e^{(\omega_H - \omega_L) - (\pi_H - \pi_L)a}$$

As shown above, larger differences between π_H and π_L make it more likely that less emotionally stable officers respond to pay increases (since the pay was more likely to influence their decision-making). Note how large differences between π_H and π_L also have a direct effect: They determine how much the different groups of officers value improvements in police performance.

Our model offers a simple, parsimonious explanation for why higher pay might differentially retain less emotionally stable officers, while improved management might differentially retain more emotionally stable ones. However, the model also illustrates how this conclusion depends on the relative magnitudes of parameters not directly observed. Ultimately, then, it is an empirical question.

3 Data and context

3.1 Data and sample

For our analyses, we use linked population-level data from administrative registers, covering basic demographic information, family links, educational attainments, income and employment information, and military enlistment test scores. To identify police officers, we begin from the Longitudinal integrated database for health insurance and labor market studies (LISA), which is an annual register that covers the labor market activities of the universe of Swedish residents aged 16 and above (15 and above in later years), for the years 1985-2022. Using records of the highest attained educational degree, we identify everyone who at any point in time has completed police training, and limit our data set to these people. Since the register on the highest attained level of education goes back further in time, this includes people who completed police training before 1985. We thus construct the complete labor market history of all those whom we observe have ever trained to be a police officer.

Our main analysis sample uses two definitions of police officers. To identify people actively working as police officers (i.e., police officers in patrolling duty) in any given year, we merge the LISA data with the *Wage Structure Survey*, which is a labor market survey covering the entire public sector (divided into state, region, and municipality firms) and a large sample of private sector firms. The state sector survey, including the Police Authority, covers salaries, contracted hours, occupational codes, industry codes, and employer codes for all employees as of September of the survey year. We define a person as a police officer if either of the following is true: a) their occupational code defines them as a police officer, or b) their occupational code is public sector manager, they work for the Police or in the Policing industry, and have completed training. In this way, we capture police officers at any rank, but exclude police employees (including trained officers) in administrative or pure investigator roles. This creates the variable "police officer".[10]

Arguably, a trained officer who has transferred to desk duty within the Police is still a productive resource for the Police authority. For the purpose of analyzing exits from policing altogether, we therefore augment this definition of officer with codes for industry of employment from the WSS database. The industry code for "policing" is unique for people employed by the Police Authority, and covers police employees in any occupation. With this definition, a person-year observation is recorded as a police officer if any of the following three criteria are fulfilled: a) working in policing and having completed police officer training,

[10]Granted, the Police Authority also employs civilians, but they are left outside of our police officer sample.

b) being a police employee and having completed police officer training, and c) having the police officer occupation code. If either of these criteria is met in one year, but none of them are true in the following year, we record this as an exit; An exit from policing is defined as no longer working for the Police authority, not having police officer as an occupation, and not working in the policing industry. Unless explicitly stated otherwise, we thus don't classify a person transferring from patrolling officer to an administrative task or to crime investigation as an exit from policing.

If a person exits temporarily for the duration of one year, e.g., for a leave of absence, parental leave, or sick leave, we don't record this as an exit. On the other hand, cases where a person leaves policing and then comes back after several years are recorded as exits. For about 2.5% of the officers in our sample, we observe several exits over time.

3.1.1 Emotional stability

We link the labor market statistics at the individual level to test results from the Swedish Armed Forces enlistment tests. These were carried out at age 18 for the full male population born in the years 1951 to 1986, and include tests of physical capacity, cognitive ability, and psychological traits.[11] The purpose of these was to evaluate each man's suitability for military service and placement within the army. Cognitive ability was evaluated through a written test, summarized in an overall score ranging from 1 to 9 on a Stantine scale. Psychological, or non-cognitive, ability was evaluated by a psychologist based on a semi-structured interview. Each man was scored between one and five on four dimensions: *emotional stability, intensity, social maturity*, and *psychological energy*, and also received an overall score between one and nine, reflecting their general suitability for military service. While the overall cognitive and non-cognitive ability scores are available for about 90-95% of the male Swedish-born population, the subscore availability is somewhat lower. See Appendix Figure A1 for an account of the enlistment data coverage across birth cohorts.

In this paper, we focus primarily on *emotional stability*, which aims to measure resilience to stress and pressure. It includes three "undercategories": disposition to anxiety, ability to control and channel nervousness, and tolerance of stress (Mood et al., 2012). Nilsson (2017) shows that these undercategories are most closely related to the "Big Five" trait of neuroticism.[12] Widiger and Oltmanns (2017) define neuroticism as follows:

> Neuroticism is the trait disposition to experience negative affects, including

[11] The share of men with test data available is 97% across birth cohorts 1951 to 1986, with the exception of men born in 1960, for whom data is available for only about 20%.

[12] This is helpful because documentation for the Big Five traits is far more complete than the Swedish military's publicly available documentation on its measures and subscores.

> anger, anxiety, self-consciousness, irritability, emotional instability, and depression. Persons with elevated levels of neuroticism respond poorly to environmental stress, interpret ordinary situations as threatening, and can experience minor frustrations as hopelessly overwhelming... [Neuroticism] provides a dispositional vulnerability for a wide array of different forms of psychopathology, including anxiety, mood, substance, somatic symptom, and eating disorders. Many instances of maladaptive substance use are efforts to quell or quash the dismay, anxiousness, dysphoria, and emotional instability of neuroticism... Neuroticism is also associated with a diminished quality of life, including feelings of ill-will, excessive worry, occupational failure, and marital dissatisfaction.

A limitation of our study is that we cannot directly verify that there are performance problems associated with less emotionally stable (i.e., more neurotic) police officers. However, using data form a long-standing citizen survey about attitudes towards public institutions (the SOM Institute annual survey, University of Gothenburg, SOM Institute (2025)), we can provide descriptive evidence on the correlation between police officer personality traits and trust in the Police. Figure A2 plots the share of respondents who state a high or relatively high trust in the Police as an institution against the share of officers in their local police unit who received a high score on emotional stability. There is a clear positive association; the estimated change from a regression framework shows that a one standard deviation increase in average emotional stability among officers is associated with a 12 percentage point (32%) increase in citizen trust.

Logically, we see clear reasons to be concerned about officers who are disposed towards anger, irritability, and emotional instability; who respond poorly to environmental stress or interpret ordinary situations as threatening; and who have a dispositional vulnerability to mood or substance disorders. Rather than empirically verifying this, we focus on how well-defined policy levers (pay and management instability) shift how officers of different personality types select out of policing.

3.1.2 Separating officers and managers

To study the effects of manager turnover in the midst of a crisis, we use occupation codes to separate officers, managers, and other police employees (e.g., civil investigators, HR specialists, accountants, etc.). We define police managers here as genuinely senior managers within units, such as local police chiefs or higher-level officials in the hierarchy. Because the Swedish Standard Classification of Occupations underwent a major update in 2014,

coincident with the Police reform, our ability to distinguish senior management also differs. For this reason, our analyses of management focus on the years 1995-2013, when the old classification was in effect.

For most parts of Sweden, a policing unit can be thought of as a municipality — the core administrative unit in citizen service provision.[13] We observe that in 2013, roughly half of municipalities did not have a manager. This is consistent with the organizational structure of the Swedish Police Authority: Municipalities ($n = 290$) are not distinct operational entities. In 2013, the county ($n = 21$) was the operational entity, and while most municipalities had a police presence and office, the office would have reported to the county police headquarters. Each office would most likely have a lower-level manager (e.g., a Sergeant), but not a unique senior-level manager of the type we focus on here. Conditional on having any senior manager, the median municipality has two, and 75% have six or fewer. Among these senior managers, our retirement analysis focuses on the oldest manager observed in 2013, i.e., the one closest to retirement age during the crisis.

Table 1 summarizes the demographic characteristics, employment statistics and enlistment test scores for police officers (column 1), police managers (column 2) and all other workers aged 25-65 (column 3). A few facts stand out. First, policing is generally a non-transitory occupation; the industry-specific years of experience is on average 15, compares to 9.4 in other sectors. The exit rate is also relatively low, at less than one percent annually across all years in our sample. Second, the annual earnings of officers is slightly higher than the average in other sectors, and the monthly salary is very close to the male median wages. Third, and most importantly, the average police officer is positively selected in terms of non-cognitive skills, and especially so in terms of emotional stability. On the other hand, their average cognitive skills match up well with the general male working population.

[Table 1 about here.]

3.2 Exits from policing

A central fact motivating our analysis is the increase in separations from policing. Figure 1 shows the fraction of officers who left policing each year since 2003. The reform was announced in January 2013 and was fully implemented by January 2015.[14] As seen in Figure 1, after years of stability, the exit rate from policing began to rise in 2014. In Appendix

[13] Exceptions include the major cities, where a cluster of municipalities will generally form larger policing units, while a single municipality can also be split into several policing areas.

[14] Given the large scale of the reform and its associated restructuring, changes would certainly have been notable to and experienced by officers prior to 2015, though we cannot provide an exact timeline of the specific changes.

Figure A3, we show that this was a nationwide shock, shared across all regions of the country and officers with all levels of experience. Given our definition of exits, this means individuals observed employed as police officers at some point in 2014, but not employees of the Police Authority in September 2015. Substantial media attention at the time emphasized that this increase was caused by the reform (The Local, 2016; Radio Sweden, 2016; Cameron, 2017).[15]

[Figure 1 about here.]

The Swedish Police Union has argued that the government should address this retention crisis by raising police officers' pay (Cameron, 2017; The Local, 2016). Salaries for police officers are, to some extent, set at the individual level based on tasks and work performance, but the salary and terms of employment are heavily regulated through industry-wide agreements between the Police Union and the police authority. While officer salaries have kept roughly pace with nationwide trends in median salaries (see Appendix Figure A7), this does not imply that they have kept pace with the actual set of alternative opportunities that officers consider. Consistent with this, in Figure 2, we show how individual earnings change when officers leave policing. Looking at exits from policing 1985-1999, officers used to experience a 10-20% earnings cut when they left policing. Looking at the post-2000 period, however, there are virtually no changes in earnings upon exit. This suggests that officer pay relative to outside options has declined, even if officer pay in real terms has grown commensurate with median wage growth.[16]

[Figure 2 about here.]

With that said, the decline in relative pay is unlikely to explain the rising exit rate seen in 2014, which is sharp, discontinuous, and coincident with the reform. The reform did not affect officer salaries and was not opposed by the police union Cameron (2017); it was aimed at organizational restructuring rather than changing personnel policies (Cameron, 2017; Landström et al., 2020). In Appendix Figure A4, we show time trends in police officer salaries, both in real terms and measured as the change in salary upon exit from policing.

[15] In 2006, there was a large one-time set of layoffs induced by budget cuts. Since our interest is in the *decision* of officers to leave, all of our analyses in the paper omit exits from 2006. As the journalistic and academic discussions highlight, the post-reform increase in exits was due to voluntary exits.

[16] There is some ambiguity about whether this analysis should consider base salaries or earnings, since earnings include overtime pay, which is more common in policing than many other sectors. Theoretically, it depends on the extent to which the employee has control over overtime pay. With that said, it matters little in practice; Appendix Figure A6 shows the comparable figure for base salaries (which includes inconvenience pay and on-call pay, but not overtime pay). From 1985-1999, salaries did not change upon exit from policing (which is consistent with Figure 2 if overtime pay is greater in the police), while from 2000-2017, salaries rose by 10% upon exit.

Neither series shows sharp or discontinuous jumps. Thus, although salaries have worsened, this is unlikely to explain the rise in exits.[17] Of course, the government might still be able to *increase* retention by raising salaries, and we now turn to exploring this possibility.

4 The Effects of Relative Pay

4.1 Methods

Given the rigid pay setting among police officers, there is no exogenous variation available for estimating how retention responds to pay changes. However, the *relative* pay in policing compared to other industries varies, and, as we show in our conceptual framework above, we see this as the symmetric effect of counterfactual pay increases *inside policing*.

We construct variation in outside options using an adapted version of the standard Bartik shock (Bartik, 1991; Bound and Holzer, 2000). The main idea of a Bartik shock is that pay increases over time vary across industries. Since local labor markets have different industrial compositions at baseline, idiosyncratic differences across industries in the nationwide wage growth they experience mean that even common industry-specific shocks will lead to very different shifts in pay across local areas. This logic yields a basic shift-share structure that has been useful for various applications in applied microeconomics.

We depart from the standard methodology in two ways. In both cases, our adjustments are motivated by the fact that our goal — understanding an individual police officer's decision to leave policing — differs from the standard goal of Bartik shocks, which is to generate variation in overall local economic growth.

First, police officers do not transition equally to all industries. Using all years and all officers leaving policing, we observe which industries officers most frequently transition into. This turns out to reflect a small set of industries where their skills and experience have clear value: insurance, the armed forces, prosecutorial services, and other forms of inspection and investigation. If one aims to construct a shock to total local economic growth, it is natural to consider the full set of all industries, as in a standard Bartik shock. However, for the purpose of capturing changes in the officer incentives to leave policing, it is motivated to focus on the specific industries that constitute the officer's choice set.[18]

Thus, we supplement the standard Bartik instrument with an additional industry-specific weight, which measures the probability that an exiting officer would transition into that

[17] Our Bartik results, below, are very similar if we restrict to the pre-reform years (Appendix Table A3).

[18] This is similar, in spirit, to Caldwell and Danieli (2024), who propose a more general method to determine the relevant choice set for all workers, and use a similar shift-share design to show that individual-specific outside options matter for private sector workers' wages even beyond the overall local component.

industry. This effectively means that we are only calculating shocks among industries that departing police officers actually enter, which improves statistical power, since we are only using variation relevant for police officers' decisions. With respect to identification, it means that our shocks capture changes in officers' employment opportunities without picking up broader shocks to total local economic growth that might affect the general experience of being a police officer.[19]

Second, because we are interested in changes to the incentives facing a given police officer, we use growth in residual wages, controlling for industry and year effects, rather than overall wages. Changes in overall wages will include a composition effect from industries attracting and hiring different types of workers, which is generally relevant if one wishes to shock local economic growth. In our context, however, given that we are already considering only industries into which police officers frequently transition, such composition changes are not helpful because they do not reflect changes in the wages available to a given worker. Instead, we focus on changes in residual wages, which directly reflect changes in the monetary incentives for a worker considering leaving policing.

Appendix Table A2 and Appendix Figure A5 describe the industry trends that drive identification in this analysis. Appendix Table A2 shows the most common industries that exiting police officers transition into. These include prosecution services, the military, insurance, inspections and licensing, and forestry. Most of these are clear examples where police officer training, experience, and skills are relevant (e.g., insurance investigations). Appendix Figure A5 then plots the annual growth in residual median wages for a set of these industries.

Many of these series exhibit large changes that are easy to understand with reference to Swedish economic and policy trends. Demand for property and casualty insurance varies over time and across space with, e.g., extreme weather events and "burglary sprees" (Svensk Försäkring, 2025), causing long periods of increased staffing needs for insurance companies. Growth in composition-adjusted military salaries began rising considerably after 2015, when Swedish military spending sharply rose in the wake of Russia's invasion of Crimea (Russia and Sweden being longstanding adversaries). Trends in forestry salaries largely follow trends in Swedish lumber prices (which fell sharply in 2008 and 2009 and then rose slowly, apart from a spike in 2014; Danske Bank (2021)). These are substantial and interpretable wage changes that have meaningful effects on the outside options available to police officers. Like extreme weather events, military bases and commercial timber forests are distributed irregularly across the country, whereby these labor demand shifts affect local communities differently.

[19]If a stronger labor market reduces crime (Raphael and Winter-Ebmer, 2001; Street, 2025) then this would reasonably imply fewer exits through an improved working climate, the opposite of what we find.

Our final estimating equation is given by:

$$Exit_{i,\ell,t} = \alpha_\ell + \delta_t + \beta \sum_{j \neq \text{police}} \theta_j s_{\ell,t-1,j} \Delta \ln(w)_{j,t}^{res,med} + \varepsilon_{i,\ell,t} \quad (1)$$

where $Exit_{i,\ell,t}$ denotes that officer i working in labor market ℓ left policing between $t-1$ and t. θ_j is the share of all exiting police officers who entered industry j (calculated over the full sample period). $s_{\ell,t-1,j}$ is industry j's share of total employment in labor market ℓ during year $t-1$.

In (1), the local labor market fixed effects α_ℓ ensure that we are not comparing exit rates across areas with more or fewer outside options, but we are considering exit rates specifically during periods in which that location is experiencing outside option wage growth. The year fixed effects δ_t ensure that we are not simply attributing changes in exit rates to aggregate nationwide wage growth, but specifically comparing localities that had a meaningful presence of the industries that are growing.

$s_{\ell,t-1,j}$ denotes lagged industry employment shares by local labor market, which are the standard Bartik weighting term. We add to this industry-specific weights θ_j, reflecting the likelihood that police officers transition into industry j. Our other modification to the standard Bartik is median residual wages (which are composition-adjusted) rather than the standard average wages.[20]

We estimate the specification from (1) for non-overlapping periods. That is, we pool together the set of officers employed in 2007, 2009, 2010, etc., and estimate whether they have left by 2008, 2010, 2012, etc.

4.2 Results

In Table 2, we present estimates of equation (1). In column (1), we estimate the effects of improved outside options on the change in wages for remaining police officers. We find no effect of improved outside options on wage increases. The estimated magnitudes imply that a 5% increase in outside options raises the salaries of remaining officers by 0.04% (compared to the 4% average annual wage growth). This is consistent with our conceptual framework (in which w_p does not respond to changes in ω) and with rigid wage-setting in the public

[20] We use median wages instead of averages because of a number of outliers that have large effects on average wages. These outliers most likely emerge because we are using very precise industry codes (which often employ a modest number of people, given that Sweden is a relatively small country). However, the benefit of using precise industry codes is that officers are observed transitioning into fairly precise industries in which their specific training and skills are intuitively relevant.

sector.[21]

[Table 2 about here.]

In column (2), we estimate the effects of improved outside options on exits from policing. We find a significant increase in the likelihood of leaving the police when the wages of alternative employment opportunities improve. Together with the null result on wages, this is inconsistent with evidence from the private sector, where employers who increase wages retain workers (Beaudry, Green, and Sand, 2012; Caldwell, Haegele, and Heining, 2025), which indicates that the separations effect we estimate reflects the inability of departments to raise wages to compete with improved outside options.

To interpret magnitudes, consider a 5% increase in outside options relative to pay in policing. This increase is roughly half of the decline in relative pay within policing that we documented above over a long period, and roughly equal to two standard deviations of our Bartik shock. Our results imply that this would increase separations from policing by 1.7 percentage points, which is large relative to the baseline separation rate of 1.1 percentage points, and close to the total increase in separations that we observe at the onset of the reform. Of course, as discussed above, it is difficult for a salary-based explanation to explain the *timing* of the pay changes. Nonetheless, it suggests that salary increases could be effective for addressing the retention crisis and reducing turnover within the police force. However, this begs the question of which officers this salary increase would retain.

In columns (3) and (4), we separate men and women. We find similar responses between women (for whom we cannot observe non-cognitive skills) and men (for whom we can), although our estimates are less precise for women because of the relative scarcity of female officers. Finally, in columns (5) and (6), we separate between men with high emotional stability and non-high emotional stability. These samples are roughly equal size (since we split at approximately the police officer median), and the standard errors are quite similar. For high emotional stability officers (column 5), however, we find no evidence that they respond to improved outside options. In column (6), on the other hand, we find large responses among officers with non-high emotional stability, effects which are roughly twice as large as the effects for the full sample.

One concern is whether the Bartik shock has a different relevance for high and non-high emotional stability officers. We think this is unlikely for three reasons. First, because both groups of officers show similar baseline separations rate, the group of former officers that

[21] DeSouzaDowneyPark study an exogenous increase in the wages of federal government workers, and find that private sector employers raised wages to compete. However, state and local governments did not, and saw a dramatic shock to employment as a result.

we use to construct the industry shares is made up of roughly equal proportions of both types. Thus, the shock we construct does not differentially reflect either group. Second, when we look at earnings changes upon exit from policing, we do not see differences between the two groups (see Appendix Figure A8). This suggests neither group of officers is leaving for systematically higher-paying jobs or sectors than the other group. Third, a χ^2 test for whether industry shares are the same for both groups cannot reject the null that they are. Taken together, this evidence suggests that the shock to outside options is equally relevant for both groups.

Instead of a statistical explanation, our conceptual framework offers a parsimonious substantive explanation. If officers with higher emotional stability have more intrinsic motivation to be police officers (i.e., they care more about the public safety mission of policing),[22] then wages are less likely to influence their decision, and they are less responsive to changes in outside options.

One implication of this framework is that because highly stable officers value the mission of policing more, they might be more responsive to changes in the operational performance of the police. We turn to this question next.

5 The Effects of Management Turmoil

As we showed above, the increase in officer exits was concentrated in the wake of the controversial reform initiated in 2013.[23] This is consistent with the anecdotal objections documented in the media about administrative and organizational inefficiencies. In settings like this, managers are most valuable, as shown in very different contexts by Adhvaryu et al. (2022) and Diaz et al. (2025): the key gains of having a good manager manifest in how they respond to unexpected and disruptive shocks, rather than in their day-to-day conduct during normal times. The broader management literature has also emphasized that a key advantage of good managers is that they retain good workers (Bender et al., 2018).

There are several reasons to expect manager turnover to affect worker retention. First, it can be consequential because of difficulties in finding a replacement.[24] Additionally, it

[22] As we noted above, regardless of whether this is true in the full population, it is very likely to be true among the people who select into policing. Because the wage returns to emotional stability are higher outside of policing, all else equal, the foregone non-policing earnings will be higher for highly emotionally stable officers to start with.

[23] Nonetheless, our estimates of the effects of relative pay are very similar if we only focus on the period before the reform (see Appendix Table A3).

[24] Jäger and Heining (2022) find that unexpected deaths of managers substantially lower the wages of workers at the firm because of the difficulty of finding replacements. See Nguyen and Nielsen (2014) for similar evidence with respect to CEO's.

will take time for a new manager's practices and effectiveness to set in.[25] Existing managers also have established relationships with, e.g., front-line officers, who are surely important for retention. However, beyond that, managers will have existing relationships with higher-level administration and employees within the Police Authority's national headquarters, and these relationships are likely important for ongoing negotiations within the context of this controversial reform aiming to centralize decision-making. With all of this in mind, we assess whether the turmoil brought by manager turnover in the midst of the retention crisis increases exits.

5.1 Methods

To assess the effects of the turmoil brought on by manager turnover in the midst of the retention crisis, we make use of Swedish retirement rules. Sweden operates a universal and mandatory *defined contribution* pension system. Pension payouts consist of three components: a public part, an occupational pension, and private savings. The statutory retirement age is 65, when all residents are eligible for public pension payments. However, the age of retirement is not fixed, and some employers allow the occupational pension component to be paid out from as early as age 55. State employees – who enjoy generous occupational pensions – could, at the time relevant for our study, start withdrawing occupational pensions from age 61, but benefited greatly in terms of total payouts by waiting until at least age 63[26]. In addition, the collective agreement for police employees stipulates additional pension savings, ensuring that early retirement (i.e., before 65) is feasible for officers of all ranks.[27]

In Figure 3, we look at the empirical age patterns in managers' retirements. To do so, we focus on the most senior managers within the municipality. In Panel (a), we plot the exit age of all managers who we observe exiting at some point when aged 50 or older in years 2000-2013 (when the occupation codes remain unchanged). Evidently, exits begin to rise at age 63. In Panel (b), we show the probability of manager retirement during the retention crisis (2014-2018) at different ages, for everyone who we observe in a manager position in year 2013. We see a large and discrete shift in the probability of retirement among managers age 58 or older (i.e., among managers turning 63 at some point during the crisis).

[Figure 3 about here.]

With this in mind, we leverage the pre-determined, cross-sectional variation in whether a municipality had a manager aged 58 or older, and ask whether these same units saw a

[25]Bandiera et al. (2020) find that it takes three years before new CEO's begin to affect firm performance.

[26]Source: The National Government Employee Pensions Board, https://www.spv.se/privatperson/statlig-tjanstepension/forsta-din-tjanstepension/tjanstepension-fodd-fore-1988/ (access 2025-11-03).

[27]Source: Polisförbundet, https://www.polisforbundet.se/rad-och-stod/din-pension/ (access 2025-11-03).

differential rise in exits during the crisis. Our estimating equation is:

$$ExitRate_{m,t} = \alpha_m + \delta_t + \beta\big(ManAge63midCrisis_m \times Crisis_t\big) + \varepsilon_{m,t} \tag{2}$$

where $Crisis_t$ is a dummy variable denoting the 2014-2018 crisis years and $ManAge63midCrisis_m$ denotes that the manager in the municipality turns 63 during the crisis.

In Equation (2), β is the key coefficient of interest, which captures the marginal increase in exits during the crisis among the municipalities most likely to experience manager turnover during this period, after accounting for the general rise in exits with year fixed effects δ_t and persistent cross-sectional differences in exit rates with municipality fixed effects α_m. Below, we also estimate a dynamic version of this specification to test whether pre-trends are parallel. As a control group, our baseline specification uses any municipality with a manager who didn't reach age 63 during the crisis, although we show that the results are robust to more restrictive control groups (e.g., municipalities with managers aged 55 or older in 2013).

5.2 Results

Figure 4 presents the difference-in-difference results in two ways. In Panel (a), we show police officer exit rates, in levels, for municipalities whose manager turned 63 during the crisis, compared to municipalities with managers of other ages. Both sets of municipalities show a dramatic increase in exits during the crisis, consistent with the administrative and organizational disruptions being a nationwide phenomenon. However, despite extremely similar exit rates leading up to the crisis, municipalities where the manager reached retirement age during the crisis see a larger increase in exits. Panel (b) then presents the coefficient plot for year-by-year changes in the difference between these groups of municipalities. As with the result in levels, there is a clear differential increase in exits among the municipalities where the manager turned 63 during the crisis.

[Figure 4 about here.]

In Table 3, we present static results showing the average effect during the crisis period. The coefficient on the crisis dummy shows that exit rates increased 1.1-1.3 percentage points during the crisis.[28] The coefficient on the interaction term shows that this increase was roughly 0.35 percentage points larger among the municipalities whose manager turned 63

[28]This specification excludes year fixed effects in order to estimate a "crisis dummy" to compare magnitudes. For regressions with year fixed effects (in which the coefficient on a crisis dummy cannot be estimated), the coefficient on the interaction term is very similar.

during the crisis. Thus, the marginal increase induced by manager turnover is about one-fourth as large as the general increase seen during the crisis— a non-trivial magnitude. Another way to interpret magnitudes is to compare it to the relative wage estimates from above, which show that manager retirements are roughly equivalent to a 1.2% wage change.[29] In Appendix Table A4, we consider different approaches to restrict the control group to municipalities with managers whose age is closer to 58. The point estimates are unchanged, and generally still statistically significant, up to the point where we restrict to only a very narrow range.

The remainder of Table 3 studies how these effects differ for different types of officers. In columns (2) and (3), we find very similar effects for men and women, though less precise for women because the sample of female officers is smaller. In columns (4) and (5), however, we find very different effects for men with high versus non-high emotional stability. We find a large and marginally significant increase in exits for emotionally stable officers, and no response for less emotionally stable officers.

[Table 3 about here.]

As discussed in our conceptual framework, much like the literature from the private sector (Gartenberg et al., 2019), we think of managers as aligning the workers of an organization with its mission and purpose, and the consequence of manager turnover in the midst of a crisis is that it can undermine the ability of the organization to pursue its purpose. With respect to policing, this purpose is public safety. If more emotionally stable officers attach higher importance to public safety, then they are more responsive to the shifts in organizational effectiveness brought on by multiple, coinciding, compounding crises.

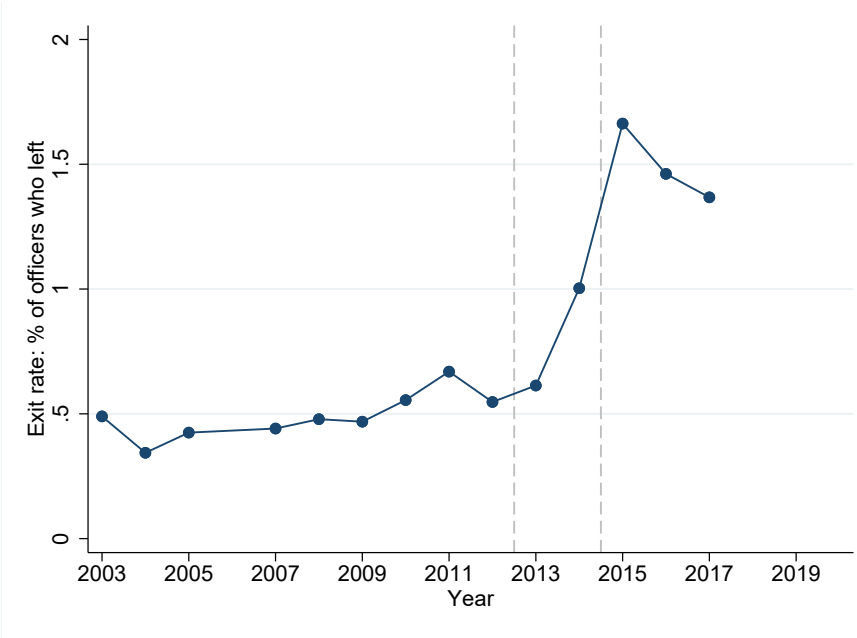
6 Conclusions

In this paper, we aim to estimate the retention effects of two separate personnel policies: Changes in pay relative to workers' outside options, and managerial turnover in the midst of an ongoing crisis. Our application is the Swedish Police, which has lately been characterized by large organizational change and staff turnover. We show that both worsening relative pay and disruptive changes in management lead to increased worker exits. However, these personnel policies have very different effects on the selection of officers who choose to

[29] Of course, as emphasized in the monopsony literature, a small wage increase can be very costly if organizations cannot identify the marginal worker, because the wage increase must be awarded to all workers (including the inframarginal). Thus, if exit rates are roughly 1%, then the costs of a 1.2% wage increase for all workers are equivalent to a 120% wage increase for the marginal workers.

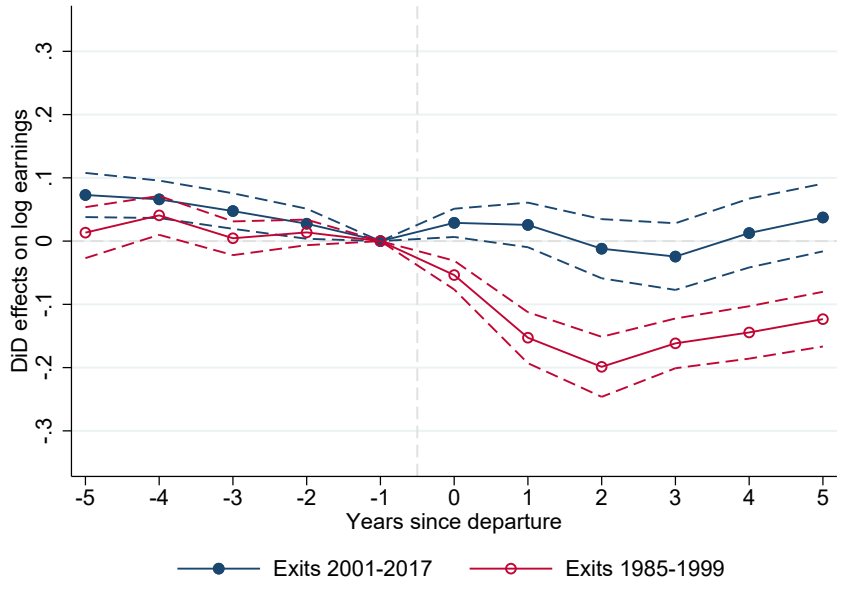
stay. While officers with lower measured emotional stability appear to attach greater value to relative pay, we find that more emotionally stable officers appear to respond more to management turmoil and crisis. This suggests that improving ongoing management issues within policing is likely to improve the composition of officers, more so than improving their relative pay.

Figure 1: The Exit Rate of Police Officers in 2003-2017.



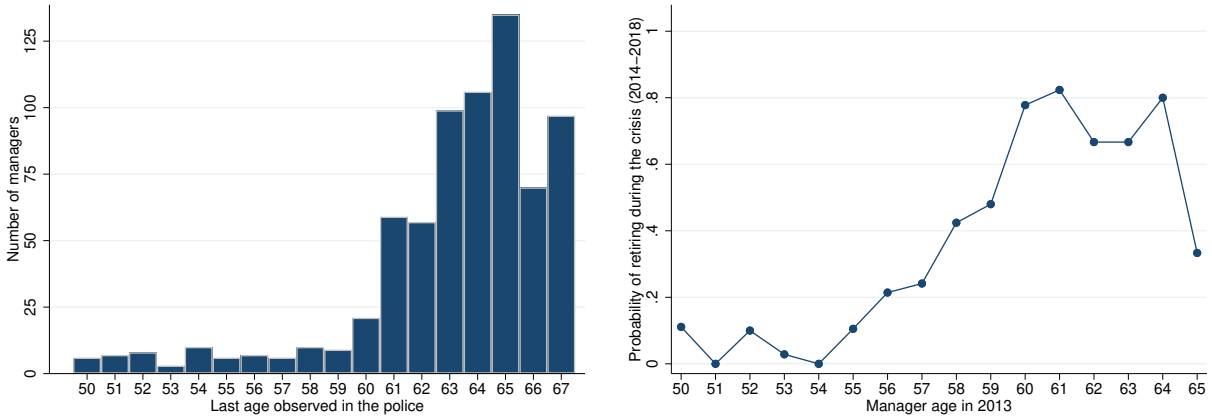
Notes: This figure shows the share of all police officers (as defined in Section 3.2) who exits policing in years 2003-2017. Exit definition: observed as police officer in year t, but not employed by Swedish Police in year $t+1$, excepting officers returning to policing within two years. 2006 is excluded because of data quality. The dashed lines indicate the time of decision (2013) and the time of implementation (2015) of the Swedish police reform.

Figure 2: Changes in Annual Earnings Upon Exit from Policing.



Notes: Sample based on individuals leaving policing and becoming employed in other sectors. For each individual, we calculate "potential police earnings" based on the average earnings of police officers during that year who have the same years of policing experience that the individual would have if they were still in policing. We then construct individual-specific "relative earnings" as the difference between the observed individual-specific earnings and their potential police earnings. We then regress these individual-specific relative earnings on individual and event time fixed effects (where event time refers to the years since we first observe the former officer employed outside of policing) for the five years before and after the exit from policing. The figure displays point estimates and 95% confidence intervals, separately for officers who left 2001-2017 and those who left 1985-1999.

Figure 3: Retirement behavior among police managers.

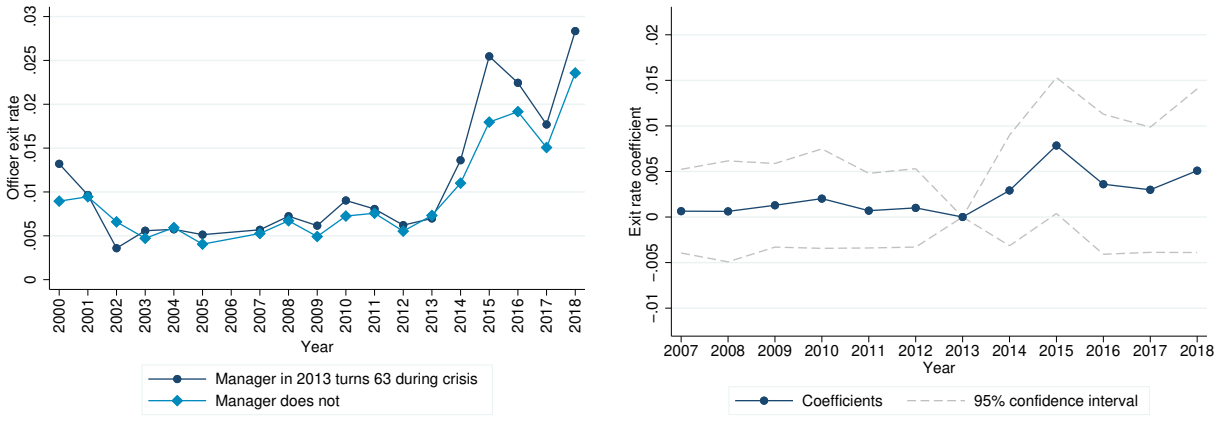


(a) Age at retirement

(b) Probability of mid-crisis retirement

Notes: Panel (a) is based on all police managers observed between 2000 and 2013 for whom we record an exit from policing. The Figure displays the histogram of the last age at which we observe them working as police employees. Panel (b) is based on all police managers observed in 2013, as a function of the age at the end of the year, and presents the share who left policing between 2014 and 2018 (i.e., during the crisis period). In both panels, manager is defined as the oldest manager for municipalities with more than one senior-level managers.

Figure 4: Marginal effect of manager turnover on exits during the 2014-2018 crisis



(a) Retirement in levels

(b) Coefficient plot

Notes: Panel (a) presents the fraction of officers who left policing in each year, separately for municipalities with and without high retirement-risk managers in 2013. By high retirement-risk, we mean that the manager in 2013 would turn 63 during 2014-2018 (i.e., during the crisis period), which is based on the oldest manager in the municipality. Panel (b) is based on the dynamic specification presented in equation (2), which includes municipality and year fixed effects. The post-2013 coefficients are jointly statistically significant. Standard errors are clustered at the municipality level.

Table 1: Summary statistics: Police officers, police managers, and other workers.

	(1) Officers	(2) Managers	(3) Other workers
Male	0.771	0.804	0.431
	(0.420)	(0.397)	(0.495)
Age	44.65	49.51	44.60
	(10.68)	(7.921)	(10.73)
Industry work experience	15.09	21.46	9.496
	(9.179)	(7.386)	(6.357)
Married	0.556	0.682	0.508
	(0.497)	(0.466)	(0.500)
Foreign background	0.0484	0.0416	0.156
	(0.215)	(0.200)	(0.363)
Monthly wages (1,000 SEK 2019)	31.98	46.73	23.40
	(7.255)	(9.796)	(12.58)
Annual income (1,000 SEK 2019)	396.9	581.4	334.2
	(113.9)	(121.3)	(160.7)
Contracted weekly hours	39.29	39.81	36.21
	(3.386)	(1.748)	(7.451)
Police training	0.997	1.000	0.00255
	(0.0527)	(0.0152)	(0.0504)
Entry into policing	0.0778	0.00620	
	(0.268)	(0.0785)	
Exit/separation	0.00743	0.0116	0.0422
	(0.0859)	(0.107)	(0.201)
Non-missing draft data	0.659	0.830	0.654
	(0.474)	(0.375)	(0.476)
Non-missing subscores	0.617	0.774	0.568
	(0.486)	(0.418)	(0.495)
Cognitive main score (1-9)	5.654	5.841	5.306
	(1.447)	(1.357)	(1.956)
Non-cog. main score (1-9)	6.495	6.768	5.196
	(1.393)	(1.293)	(1.700)
Emotional stability = 1	0.00347	0.00139	0.0202
	(0.0588)	(0.0372)	(0.141)
Emotional stability = 2	0.0443	0.0248	0.167
	(0.206)	(0.155)	(0.373)
Emotional stability = 3	0.449	0.402	0.565
	(0.497)	(0.490)	(0.496)
Emotional stability = 4	0.442	0.495	0.217
	(0.497)	(0.500)	(0.412)
Emotional stability = 5	0.0573	0.0697	0.0204
	(0.232)	(0.255)	(0.141)
Observations	374,480	17,265	50,084,943

Observations are person-year. Column 3 does not include police employees. The exit rate in column 3 is higher than the workforce separation rate because the panel is not necessarily consecutive years for private sector workers. Foreign background is defined as being born outside Sweden or both parents born outside Sweden.

Table 2: Officer separation responses to improved outside options

	(1)	(2)	(3)	(4)	(5)	(6)
DV:	Δ Salary	Exits				
Sample	Stayers	All	Women	Men		
Em. Stability	All	All	All	All	High	Non-high
ΔMedian Wage$_{\ell,t}$	0.008	0.339***	0.408*	0.291**	-0.053	0.593**
	(0.435)	(0.111)	(0.218)	(0.115)	(0.187)	(0.224)
N	67,443	72,010	22,685	49,325	19,398	21,245
R^2	0.030	0.005	0.013	0.004	0.008	0.007
DV Mean	0.044	0.011	0.011	0.012	0.013	0.011
σ_x	0.023	0.022	0.022	0.023	0.024	0.023

* $p < .10$, ** $p < .05$, *** $p < .01$. Unit of observation is an individual-year. Standard errors clustered at the local labor market level are in parentheses. The sample is based on police officers in 2007, 2009, 2011, 2013, 2015, and 2017, and the change in salary (column 1) or exits from policing (columns 2-6) are calculated within the next two years. All specifications include year and local labor market fixed effects, and the key independent variable is the Bartik shock to median non-police wages in locally available sectors that police officers frequently transition to; see Equation (1). "High" emotional stability refers to scores 4 or 5, while "non-high" refers to 1-3. Sample sizes for all men do not reflect the sum of high and non-high men because we do not observe draft subscores for a small number of male officers.

Table 3: Marginal effect of manager turnover on exits during the 2014-2018 crisis

DV: Exit rate	(1)	(2)	(3)	(4)	(5)
Sample:	All	Women		Men	
Em. Stability:	All	All	All	High	Non-high
Crisis_t	1.107***	1.194***	1.068***	1.317***	1.131***
	(0.109)	(0.173)	(0.115)	(0.140)	(0.139)
$\text{ManagerTurns63midCrisis}_m$	0.350**	0.346	0.349**	0.536*	-0.100
$\times\text{Crisis}_t$	(0.148)	(0.264)	(0.168)	(0.315)	(0.240)
N	1,166	1,109	1,155	1,103	1,102
R^2	0.286	0.204	0.245	0.192	0.150
N. municipalities	100	98	100	99	99
DV Mean	1.20	1.10	1.15	1.34	1.04

* $p < .10$, ** $p < .05$, *** $p < .01$. Unit of observation is a municipality-year. Standard errors clustered at the municipality level are in parentheses. Sample is based on municipality-years from 2007-2018, for municipalities in which we observe a manager in 2013. All regressions weight by the number of officers. All specifications include municipality fixed effects. "Crisis" dummy refers to 2014-2018 (when we observed elevated separations); results are very similar if we include year effects, but the "Crisis" coefficient cannot be estimated, which prohibits comparison of magnitudes. $\text{ManagerTurns63midCrisis}_m$ is based on the eldest manager within the district in 2013. For the estimating equation, see Equation (2). "High" emotional stability refers to scores 4 or 5, while "non-high" refers to 1-3.

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Online Appendix

A Additional Results

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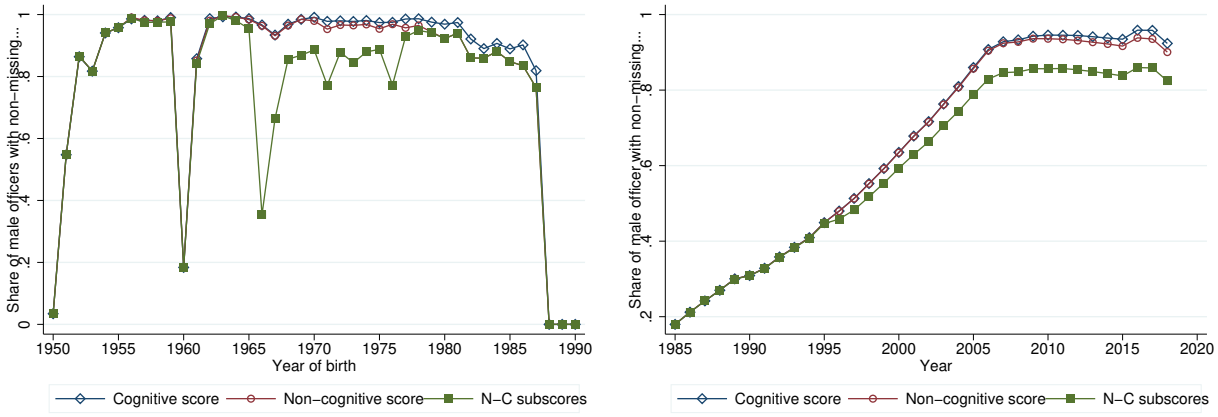
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Figure A1: Availability of military draft data for Swedish-born males.

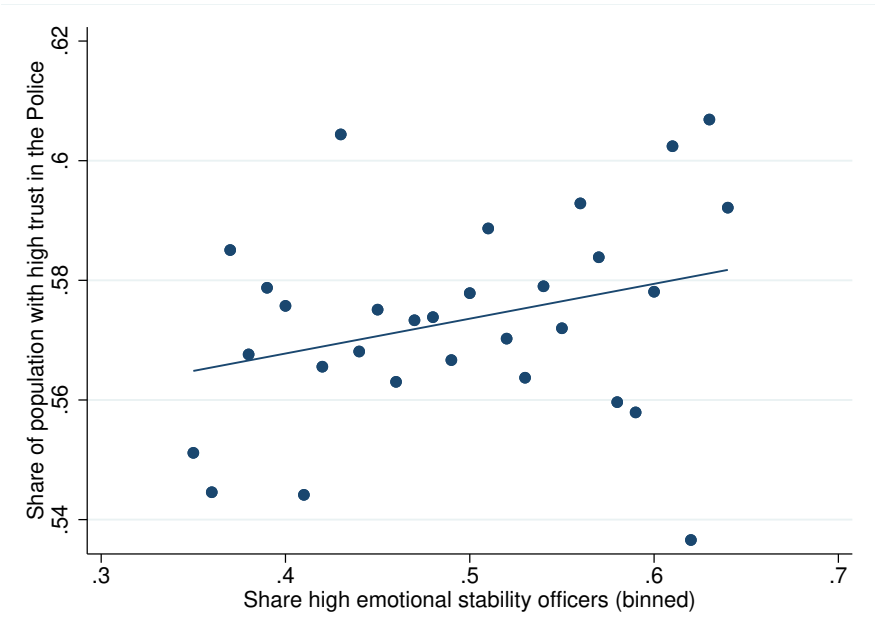


(a) Test scores by birth cohorts

(b) Test scores by labor market year

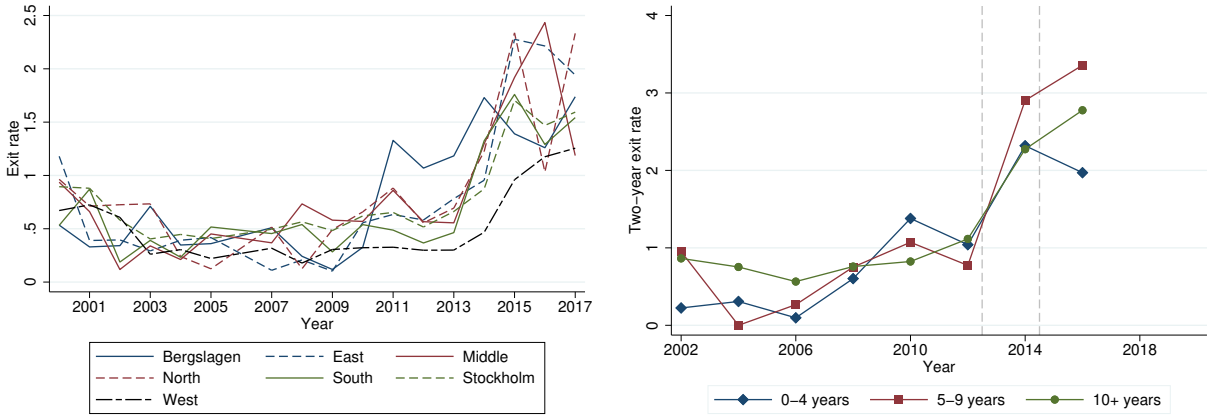
Notes: This figure shows the share of men in each birth cohort from 1950 to 1990 (panel a) and among all police officers in each calendar year (panel b) for whom the military enlistment test data is available. *Cognitive score* shows the share with a non-missing cognitive main score, i.e., with any test data available. *Non-cognitive score* shows the share with a non-missing psychological (non-cognitive) main score. *N-C subscores* shows the share with non-missing non-cognitive subscores, including *emotional stability*. The sample is limited to men born in Sweden, and in panel b to men aged 30 to 55.

Figure A2: Association between citizen trust in the Police and share of high emotional stability police officers.



Notes: This figure shows a binned scatter plot of the association between trust in the police and share of officers with high scores on emotional stability, and a fitted linear relation. Each dot represents a region-year (*län*-year) observation, aggregated into bins of 0.01 along the x-axis. The x-axis shows the share of a the men in local police unit with a score of 4 or 5 on emotional stability. The y-axis shows the share of survey respondents in that same region and year stating that they have medium or high trust in the police, from the SOM Institute datset (University of Gothenburg, SOM Institute, 2025). Data from years 1986 to 2018.

Figure A3: Exit rate among police officers, by region and level of experience.

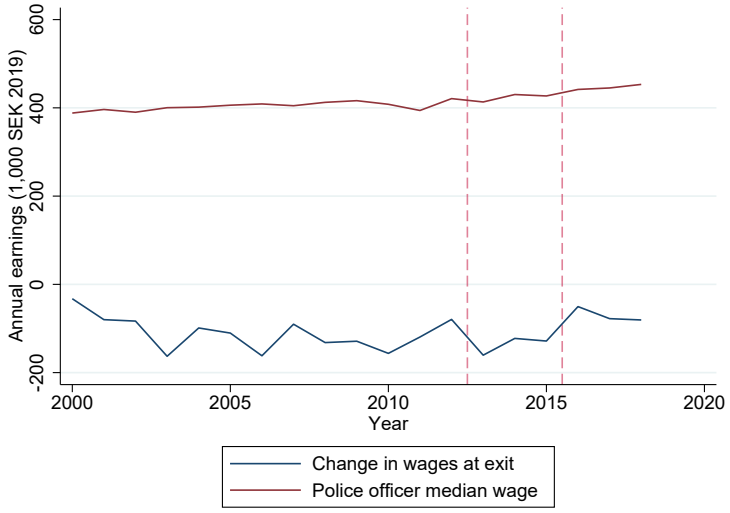


(a) Exit rate by police region

(b) Exit rate by work experience

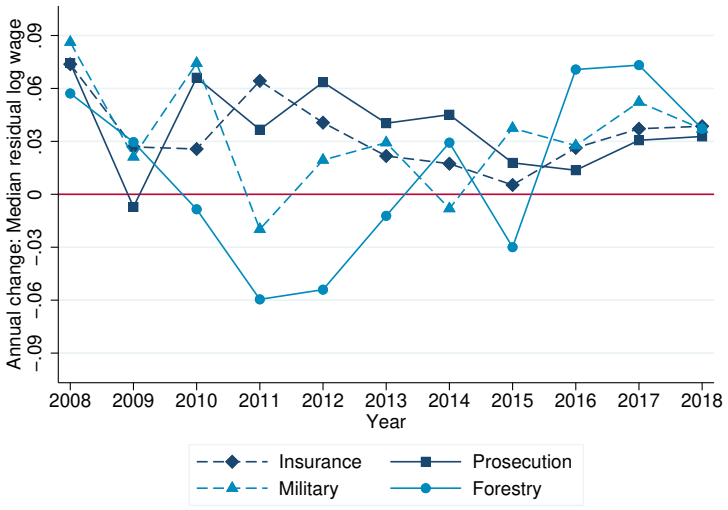
Notes: This figure shows the exit rates among police officers, by Police Regions in panel (a) and by number of years employed as a police officer (in bins) in panel (b). Exits are defined as being employed as a police officer in year t but no longer working for the Swedish Police in year $t+1$. Police regions were instituted during the 2015 reform, but the previous administrative units (*län*) map seamlessly into Police Regions. Experience is calculated as the number of years since graduation from Police College.

Figure A4: Police officer median wages and average change in earnings from leaving policing.



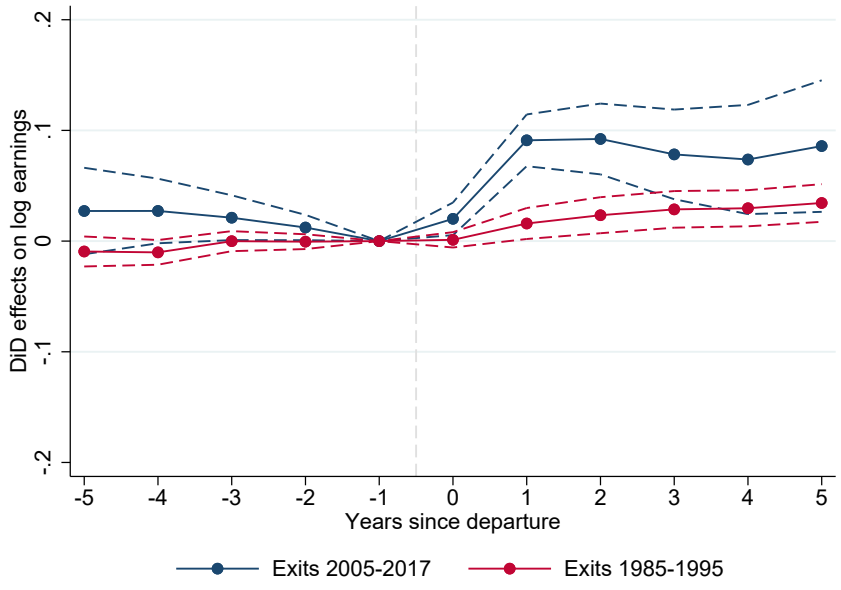
Notes: This figure shows median police officer annual earnings across years 2000 to 2018, and the average change in earnings that officers get when transitioning to another job. The red dashed lines indicated the period of decision and implementation of the Swedish police reform.

Figure A5: Annual changes in median residual log wages in select industries.



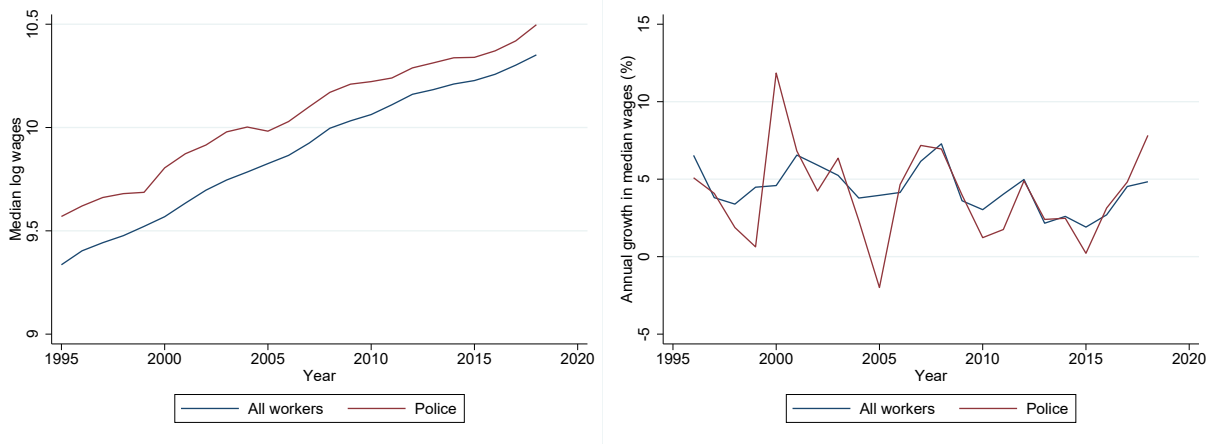
Notes: This figure shows the annual changes in median log residual wages (controlling for a full set of 5-digit industry codes and year effects), for four sectors among the set of industries that police officers most often transition into. *Insurance*: 65.120, Non-life insurance. *Prosecution*: 84.231, Public prosecutor activities- *Military*: 84.221, Military defence activities. *Forestry*: 02.101, Forest management.

Figure A6: Changes in monthly salary upon exit from policing.



Notes: Sample based on individuals leaving policing and becoming employed in other sectors. For each individual, we calculate "potential police salaries" based on the average salary of police officers during that year who have the same years of policing experience that the individual would have if they were still in policing. We then construct individual-specific "relative salaries" as the difference between the observed individual-specific salary and their potential police salaries. We then regress these individual-specific relative salaries on individual and event time fixed effects (where event time refers to the years since we first observe the former-officer employed outside of policing) for the five years before and after the exit from policing. Figure displays point estimates and 95% confidence intervals, separately for officers who left 2005-2017 and those who left 1985-1995.

Figure A7: Median (log) monthly salaries and salary growth, among police and all workers

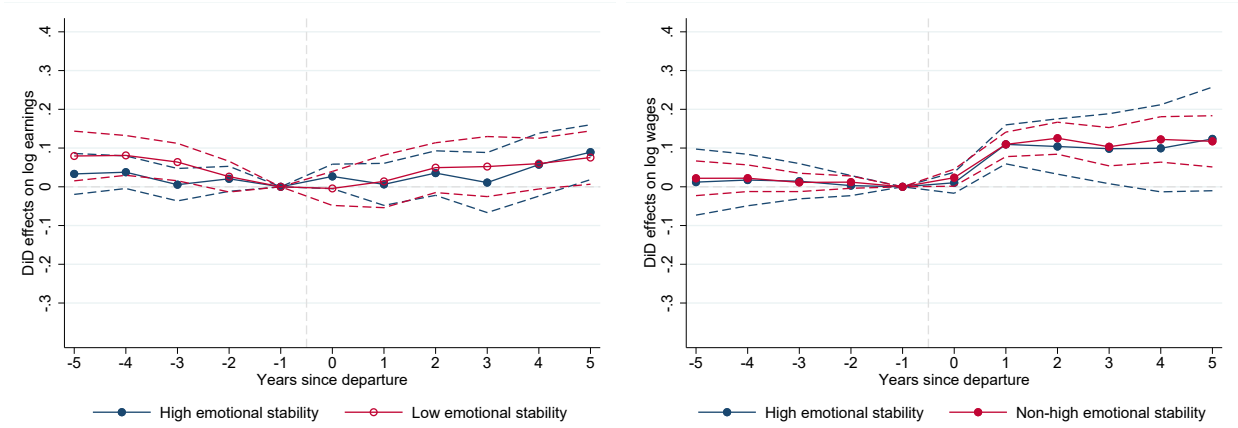


(a) Median log salary

(b) Change in median log salary

Notes: This figure shows the development of pay across years 1995 to 2018, for police officers and all other workers. Panel (a) depicts growth in real median (log) monthly salaries, Panel (b) shows annual wage growth (of median wages) in percent, in policing and on average across all other sectors.

Figure A8: Earnings and salary changes upon exit from policing, separately by emotional stability score



(a) Earnings changes

(b) Salary changes

Notes: Sample based on individuals leaving policing and becoming employed in other sectors in years 2000-2017 for officers aged 30-55. For each individual, we calculate "potential police earnings" (Panel (a)) or "potential police salaries" (Panel (b)) based on the average earnings or salary, respectively, of police officers during that year who have the same years of policing experience that the individual would have if they were still in policing. Note that earnings includes overtime, while salaries do not. We then construct individual-specific "relative earnings/salaries" as the difference between the observed individual-specific earnings/salary and their potential police earnings/salaries. We then regress these individual-specific relative earnings/salaries on individual and event time fixed effects (where event time refers to the years since we first observe the former-officer employed outside of policing) for the five years before and after the exit from policing. Figure displays point estimates and 95% confidence intervals, separately for officers with emotional stability scores 4 or 5 (high) compared to those with scores 1-3 (low or non-high).

Table A1: Wage returns to high emotional stability

	Police			Private sector		
	(1)	(2)	(3)	(4)	(5)	(6)
High emotional stability	0.025***	0.019***	0.010***	0.187***	0.056***	0.048***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Occupation FE	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	Yes	No	Yes	Yes
Age	No	No	Yes	No	No	Yes
Age^2	No	No	Yes	No	No	Yes
Work experience	No	No	Yes	No	No	Yes
N	131,767	131,767	131,767	7,116,253	7,116,253	7,116,253

* $p < .10$, ** $p < .05$, *** $p < .01$. Observations are person-year. Standard errors clustered at the individual level in parentheses. *High emotional stability* is defined as being evaluated at 4 or 5 on emotional stability in the military enlistment psychological interview. The sample is restricted to men for whom we observe emotional stability scores (about 60% of police officers).

Table A2: Main industries of former officers

(1)	(2)
Industry	Share
Prosecution services	7.9%
Military/defense	7.5%
Management of apartment buildings	4.7%
Inspection, control, and licensing	4.7%
Non-life insurance	4.1%
Government support activities (n.e.c.)	2.3%
Forestry	2.2%
Government legislation and planning	1.9%

This table lists the top industries that police officers transition into when leaving policing. Industries are defined as 5-digit industry (SNI) codes that describe the activities of firms and public sector employees; see `https://snisok.scb.se/en` for a full description of the activities belonging to each code. *Exit* is an indicator variable taking the value one if a person was a police officer last year, but not employed in any capacity by the Police in the present year.

Table A3: Officer separation responses to improved outside options (excluding crisis years)

	(1)	(2)	(3)	(4)	(5)	(6)
DV:	Δ Salary	Exits				
Sample	Stayers	All	Women	Men		
Em. Stability	All	All	All	All	High	Non-high
ΔMedian Wage$_{\ell,t}$	0.165	0.317**	0.467*	0.241*	-0.213	0.649***
	(0.595)	(0.144)	(0.274)	(0.131)	(0.271)	(0.241)
N	32,998	35,257	10,613	24,641	10,303	10,749
R^2	0.047	0.004	0.012	0.005	0.008	0.013
DV Mean	0.039	0.007	0.006	0.008	0.008	0.008
σ_x	0.029	0.029	0.029	0.030	0.030	0.030

* $p < .10$, ** $p < .05$, *** $p < .01$. Unit of observation is an individual-year. Standard errors clustered at the local labor market level are in parentheses. Sample is based on police officers in 2007, 2009, and 2011, and the change in salary (column 1) or exits from policing (columns 2-6) within the next one year. All specifications include year and local labor market fixed effects, and the key independent variable is the Bartik shock to median non-police wages in locally available sectors that police officers frequently transition to; see Equation (1). "High" emotional stability refers to scores 4 or 5, while "non-high" refers to 1-3. Sample sizes for all-men do not reflect the sum of high and non-high men because for a minority of male officers, we do not observe draft subscores.

Table A4: Robustness: More restrictive control groups

DV: Exit rate	(1)	(2)	(3)	(4)
Control group manager ages	All	45+	50+	55+
ManagerTurns63midCrisis$_m$ $\times$Crisis$_t$	0.363** (0.146)	0.357** (0.150)	0.325** (0.155)	0.329** (0.159)
N	1332	1166	1039	932
R^2	0.301	0.331	0.352	0.355
N. municipalities	114	100	89	80
DV mean	1.28	1.20	1.22	1.29

* $p < .10$, ** $p < .05$, *** $p < .01$. Unit of observation is a municipality-year. Standard errors clustered at the municipality level are in parentheses. Sample is based on municipality-years from 2007-2018, for municipalities in which we observe a manager in 2013. All regressions weight by the number of officers. All specifications include municipality fixed effects and year fixed effects. "Crisis" dummy refers to 2014-2018 (when we observed elevated separations); results are very similar if we include year effects, but the "Crisis" coefficient cannot be estimated, which prohibits comparison of magnitudes. ManagerTurns63midCrisis$_m$ is based on the eldest manager within the district in 2013. For the estimating equation, see Equation (2). Relative to our primary specification (Table 3), columns 2-4 restrict the control group to only include municipalities with manager ages close to 58.