Do Higher Civil Servant Salaries Limit Corruption? Evidence from Hong Kong

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This draft: June 2024

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Abstract

We analyse a hand-collected sample of 41,540 corruption complaints by the public that have led to 2,196 prosecutions and 933 convictions of government officials during 1974-2019 in Hong Kong (over 2,649 department-years). We measure civil service corruption and civil service salaries at the government department level. Our analysis allows us to compare across departments at the same period of time, thus keeping market-level and time-varying enforcement and institutional factors constant. We find a strong negative relationship between civil service salaries and corruption, which is robust to different estimation approaches. Our results are economically significant. We find that a 10% increase in salary leads to a 4% reduction in prosecutions, between 7.5% and 21% reduction in convictions (three years later), and between 3.4% to 4.9% reduction in aggregate bribe amounts solicited or accepted (after one year). Unlike the inconclusive results obtained in previous studies that use real world data, our results using our more granular data are strongly in line with the theoretical and controlled laboratory experimental evidence in previous studies.

Keywords: Corruption, bribes, civil service; salary; wages

***JEL* classification:** D73; J31; K42; M52

1. Introduction

Does paying civil servants higher salaries prevent them from becoming corrupt? Policymakers have been grappling with this question for at least a thousand years. In 1070s China, chief minister Wang Anshi increased the salaries of government officials in an effort to prevent embezzlement of state funds, and around 200 years later, the Kublai Khan (Emperor Shizu) did the same in order to reduce rampant corruption.[1] In 1868, Hong Kong's Governor MacDonnell *opposed* salary increases for police officers, on the grounds that "it would probably only lead… to the acceptance of bribes in addition to increased salaries."[2] In 1891, Governor Des Voeux identified the low level of salaries (relative to the profits from illegal gambling activities) as a major driving force behind corruption in the police.[3] More recently, Singapore's Prime Minister Lee Kuan Yew emphasized that paying high salaries to government officials is crucial in ensuring probity in government.[4]

The academic literature on the relationship between salaries and corruption offers equally conflicting results. On the one hand, the theoretical and the experimental literature mostly shows that higher salaries reduce corruption. The theoretical case behind high salaries to limit corruption has been articulated by Becker and Stigler (1974) and Cadot (1987).[5] Well-paid civil servants may be unwilling to risk everything by engaging in corrupt activities (alternatively, the opportunity cost for engaging in such activities becomes higher), thus leading to less corruption. Moreover, empirical studies that conduct controlled laboratory experiments have mostly found a negative relationship between wages and corruption (see, for example, Azfar and Nelson, 2007; Armantier and Boly, 2011; and Van Veldhuizen, 2013).[6]

In contrast, studies that use real world within-country or cross-country data produce very inconsistent results that range from a negative relationship between salaries and

[1] Von Glahn (2016), p 238; Ha (2017)
[2] "Votes and Proceedings of the Legislative Council of Hong Kong," The Hong Kong Government Gazette, Vol XIV, No 43, 3 October 1868
[3] Minutes of the Legislative Council, 5/19 March 1891
[4] "Singapore will remain clean and honest only if honest and able men are willing to fight elections and assume office… If we underpay men of quality as ministers, we cannot expect them to stay long in office… Adequate remuneration is vital for high standards of probity in political leaders and high officials." (Lee, 2000; p 166-167)
[5] Although Barro (1973), Besley and McLaren (1993), and Sosa (2004) qualify this argument based on different assumptions.
[6] Although Abbink (2000) and Barr, Lindelow and Serneels (2009) find no significant relationship.

corruption,[7] to no significant relationship,[8] to a relationship that changes sign according to circumstances,[9] all the way to a positive relationship which suggests that corrupt individuals may opt to receive both higher salaries and more bribes.[10] Often different studies offer conflicting results for the same country. The answer to this question has far-reaching public policy implications. If the level of salaries does affect corruption, increasing civil servant salaries can complement other anti-corruption mechanisms that are more difficult to set up.

The reason behind the inconsistent results when using real world within-country and cross-country data is likely the difficulty in measuring corruption, salaries, and opportunities to engage in corrupt activities when comparing across countries, states or provinces as these studies do (see Section 2, Table 1).

First, corruption generally involves illegal or unauthorized transfers, either monetary or in-kind, which are undisclosed (Rose-Ackerman, 1975, p. 185). Most previous studies rely on indexes that measure corruption *perceptions* or self-reported questionnaires, and others on indirect measures (such as examination scores or input prices) rather than actual corruption activity. Even for studies that examine convictions for corrupt activities, there is variation in how different countries, states or provinces (for example, in the US, China or Russia) prosecute corruption cases. For example, Goel and Nelson (1998) show that conviction rates for abuse of public office by elected officials vary more than tenfold across U.S. states. It is hard to control for institutional factors, both in cross-country and cross-state/province comparisons. Moreover, salary levels are also measured with significant noise as averages at the state/province or country level.

Second, different occupations in the civil service offer different opportunities for engaging in corrupt activities. Occupations that have frequent contact with the public (even more so if the contact is with citizens willing to break the law, as in the case of the police of judicial authorities), may offer more opportunities for corruption compared to occupations without such contact. Different provinces may have different composition of civil services, for

[7] Goel and Rich (1989), Goel and Nelson (1998), Chand and Moene (1999), McLeod (2008), Dutt (2009), Le, de Haan and Dietzenbacher (2013), Dong and Torgler (2013), Borcan, Lindahl, and Mitrut (2014), Schulze, Sjahrir and Zakharov (2016), An and Kweon (2017).
[8] Treisman (2000), Rauch and Evans (2000), Panizza (2001), Swamy, Knack, Lee and Azfar (2001), Van Rijckeghem and Weder (2001), Mishra, Subramanian and Topalova (2007), Pellegrini and Gerlagh (2008), Dahlström, Lapuente and Teorell (2012), Alt and Lassen (2014).
[9] Di Tella and Schargrodsky (2003), Herzfeld and Weiss (2003), Chen and Liu (2018), Demirguc-Kunt, Lokshin and Kolchin (2023).
[10] Karahan, Razzolini, and Shughart II (2006), Gong and Wu (2012), Foltz and Opoku-Agyemang (2015), Navot, Reingewertz and Cohen (2016).

example, different proportions of customs, immigration and police officers. Using data for 2016 from the U.S. Annual Survey of Public Employment & Payroll (ASPEP) from Kaplan (2018), we estimate that the proportion of policemen in total state/local civil service employment is 2.6 times higher in the District of Columbia (DC) compared to Alaska, and the proportion of judicial and legal employees is 3.5 times higher in Hawaii than in Mississippi or Maine.[11] The composition of civil services across provinces and states may depend on state characteristics (more customs officers in provinces with ports, immigration officers in border states, or police officers in metropolitan centres with higher criminality), making opportunities for corruption unequal across states/provinces. The probability of observing a corruption case should be positively related to corruption opportunities in the state's civil service but previous studies that compare corruption across states or provinces lack adequate controls, since opportunities for corruption across different occupations are difficult to measure.

Third, Besley and McLaren (1993), Di Tella (2001), Graf Lambsdorff (2005) and McLeod (2008) suggest that the relationship between salaries and corruption in previous studies may be driven by reverse causality. Corrupt countries (or provinces) may lack resources and thus pay low civil service salaries or they may be paying low salaries deliberately in order to sustain a corrupt bureaucracy. Moreover, Treisman (2007) suggests that one of the problems with the literature is that it is not known with what lag political or economic variables affect corruption. For these reasons, Meyer-Sahling, Mikkelsen and Schuster (2018) suggest that examining the relationship between civil service management practices and corruption requires more granular data at the organizational level.

Our data enable us to tackle better all these measurement issues. We analyse a comprehensive dataset of corruption data obtained from Hong Kong's Independent Commission Against Corruption (ICAC), comprising an unbalanced panel of 90 government departments over 46 years (2,649 department-year observations).[12] These departments have experienced 41,540 corruption complaints by the public, 2,196 prosecutions and 933 convictions of government officials during 1974-2019. In addition, we analyse data from

[11] Across U.S. states, the proportion of police employees in total state/local public employment (measured in full-time equivalent staff) ranges from 3.8% in Alaska to 9.8% in DC. That of judicial and legal employment ranges from 1.4% in Maine and Mississippi to 4.9% in Hawaii. Similar differences are observed across other occupations.

[12] In 1974, anti-corruption enforcement in Hong Kong was entrusted to a new independent agency, the ICAC. The work of the ICAC succeeded in transforming Hong Kong from one of the most corrupt territories in the world to one of the cleanest in a short period of time (see Section 3).

ICAC's 7,129 press releases during 1974-2017 that allows us to obtain dollar amounts for bribes accepted or solicited by civil servants in these departments.

Our data and tests improve on previous studies in three important ways. First, our data is more granular. We analyse four different measures of civil service corruption (complaints, prosecutions, convictions, and bribe amounts). While each of the measures may measure corruption with noise, taken together they provide a very comprehensive picture of corruption activity. Moreover, we measure civil service corruption and civil service salaries at the *government department level*. Our analysis effectively allows us to compare across departments at the same period of time, thus keeping market-level and time-varying enforcement and institutional factors constant. Average salary levels across departments are estimated more accurately by reference to departmental expenses on staff emoluments and staffing levels.

Second, we can control for differences in the opportunities to engage in corrupt activities across departments. The Corruption Prevention Department (CPD) of the ICAC is tasked with providing advice on processes that create opportunities for corruption in order to eliminate such opportunities. This advice may be requested by the department or initiated at the discretion of the ICAC. Consequently, it reflects the perception of the department's management that there may be corruption opportunities and/or a similar perception formed independently by the ICAC. During our sample period the ICAC has conducted 2,476 department-assignments. By measuring these assignment studies for each department in our sample, we obtain a very good time-varying control for the opportunities for corruption offered by each department.

Finally, having 46 years of data allows us to estimate more robust specifications that are not possible in previous studies. They include regressions of first differences in corruption activity and salaries, and Heckman two-stage procedures, where the first stage models the likelihood of corruption activity and the second stage examines the relationship between corruption and salaries. Moreover, we can estimate the lag with which changes in salary affect corruption.

Our results using our more granular data are strongly in line with the laboratory experimental evidence in previous studies, and align with the theoretical predictions of Becker and Stigler (1974) and Cadot (1987). We find a strong negative relationship between civil service salaries and corruption, which is present using all four measures of corruption activity,

and is robust to different estimation approaches. Our results are also economically significant. Based on our Heckman two-step specifications, a 10% increase in average departmental salary leads to a 4% reduction in prosecutions, between 7.5% and 21% reduction in convictions, and between 3.4% to 4.9% reduction in aggregate bribe amounts solicited or accepted by staff of the department (with lags between 1-3 years). Our results are robust to different specifications using levels, percentage first differences, and percentage deviations from average civil service salary, co-integration equations, to analysing individual bribery cases (obtained from ICAC's press releases), to excluding outliers and to estimating logit models of the likelihood of observing corruption cases. Moreover, all our specifications include department and year fixed effects. Some specifications also control for corruption perceptions in Hong Kong and willingness to report corruption from ICAC surveys, overall non-corruption criminal cases handled by the Hong Kong Police, post-secondary education attainment, trade with Mainland China, GDP per capita, and annual GDP growth rates.

Our paper contributes to the literature on corruption in several ways. First, we analyze a comprehensive dataset of direct data on actual corruption activity, and we do not rely on corruption perceptions or self-reported survey data with limited generalizability. Our more granular data, which allows us effectively to compare across different departments by keeping enforcement and market factors constant, and to use four different proxies for corruption activity, improves on measurement problems in previous studies that analyse real world data. Second, possibly because of our improved measurement, our results are in line with the theoretical framework of Becker and Stigler (1974) and Cadot (1987), and with the controlled laboratory experimental evidence in previous studies. They contrast with the bulk of real world studies that find inconclusive evidence. Moreover, our results are in contrast to the indirect findings by Di Tella and Schargrodsky (2003), who find no relationship between salaries and hospital input prices during periods of high outside monitoring by authorities and a negative relationship during periods of less monitoring. Hong Kong civil servants have been under very high levels of outside anti-corruption monitoring throughout the period since 1974, as ICAC engaged in sustained investigations, elimination of corruption opportunities, and education of the public. It is under this very strict monitoring regime, when corrupt officials could more easily be identified, that we find a strong negative relationship between salaries and corruption.

The remaining of the paper proceeds as follows. The next section reviews the related literature. Section 3 discusses the history of corruption in Hong Kong and the institutional

environment. Section 4 describes the data and the variables used in this study. Sections 5 and 6 report our main results and robustness tests. Finally, Section 7 concludes.

2. Review of the literature

The literature on the causes of corruption identifies several key factors which are related to the economic and political environment, enforcement, and culture.[13] However, many of these studies find conflicting results. Furthermore, the majority analyse corruption *perceptions* (rather than actual corruption activity), data from self-reported questionnaire surveys, field experiments or discuss clinical evidence with potentially limited generalizability. When examining the size of the benefits that firms receive from bribery in a sample of actual corruption cases worldwide, Cheung, Rau and Stouraitis (2021) find little evidence that many of these institutional factors have an impact on the benefits that corrupt firms receive.

Table 1 reports an extensive list of previous studies that examine the relationship between wages and corruption, and the main characteristics and findings of these studies. We classify them as theoretical and empirical, with empirical studies further classified into studies analysing experimental evidence, real world within-country evidence, cross-country evidence, and country case studies that describe a relationship without reporting formal tests. The theoretical and experimental studies almost overwhelmingly hypothesize/document a negative relationship between salaries and corruption. In contrast, studies that analyse within- and cross-country real-world data provide mixed results, as do case studies.

The theoretical case behind high salaries to limit corruption (Panel A) has been articulated by Becker and Stigler (1974). Assuming that corrupt officials are fired and lose everything they have gained from malfeasance if caught, the optimal wage to deter corruption is inversely related to the probability of detection and directly related to the gain from the

[13] For surveys of the extensive academic literature on the overall determinants and consequences of corruption, see Bardhan (1997), Jain (2001), Azfar, Lee and Swamy (2001), Svensson (2005), Graf Lambsdorff (2005) or Olken and Pande (2012). Less corruption has been associated with more competition, low regulation, and low barriers to trade (Ades and Di Tella, 1999; Henderson and Kuncoro, 2004), strong institutions and judicial system independence (Ades and Di Tella, 1996; Aidt, 2011), freedom of the press and media exposure (Treisman, 2007; Pellegrini and Gerlagh, 2008; Goel et al., 2012; Schulze et al., 2016; Dong and Torgler, 2013), democratic exposure (Treisman, 2000; Pellegrini and Gerlagh (2008), economic growth and unemployment (Glaeser and Saks, 2006; Schulze et al., 2016), the degree of fiscal and political decentralization of the political system (Albornoz and Cabrales, 2013; Birney, 2014), the concentration of urban population (Goel and Nelson, 2010), cultural factors such as Protestantism, British colonial heritage, female participation in government (Treisman, 2000; Dong and Torgler, 2013), education (Glaeser and Saks, 2006; Dong and Torgler, 2013), religiosity (Armantier and Boly, 2011), social capital and generalized trust (Bjørnskov and Paldam, 2004), how political power (formal and informal) is exercised (Li et al., 2017), and high IQ among the population (Potrafke, 2012).

corrupt activity (the bribe). Well-paid civil servants may be unwilling to risk losing everything by engaging in corrupt activities (or alternatively, the bar for engaging in such activities becomes higher), thus leading to less corruption. Cadot (1987) shows how higher wages increase the opportunity costs of corruption, thus reducing corrupt behaviour, while low wages and strong regulatory power concentrated in the hands of government officials produce incentives to become corrupt. In contrast, in Barro (1973), Besley and McLaren (1993), and Sosa (2004) the relationship is sensitive to specific assumptions and conditions. For example, Sosa's (2004) theoretical model suggests that anticorruption policies designed to increase the income of potentially corrupt agents not only may be ineffective but may actually encourage more corruption. Nevertheless, a negative relationship between wages and corruption could be obtained – but is not guaranteed – when the penalties meted against corrupt officials are high enough to totally deprive them from receiving their legal income.

When we examine studies that conduct controlled experiments (Panel B), they also mostly document a negative relationship between wages and corruption. Armantier and Boly (2011) conduct a controlled field experiment in Burkina Faso, with subjects correcting examinations, and find that offering higher wages to the examiners lowered the probability that they would accept a bribe. Azfar and Nelson (2007) and Van Veldhuizen (2013) conduct laboratory experiments and also find an inverse relationship between wages and corruption. Nevertheless, in other experimental settings, Abbink (2000) and Barr, Lindelow and Serneels (2009) find inconclusive evidence. Most experimental studies are conducted on small sample sizes, which may limit generalizability.

The results of the remaining empirical studies that analyse real world data fail to replicate the consistency of the theoretical and experimental studies. More closely related to the analysis in this paper are studies that analyse within-country real world data in Panel C. These studies show mixed results that range from a negative relationship to no relationship to a positive relationship, even when analysing data from the same country. For example, analysing data at the US state level, Goel and Rich (1989) and Goel and Nelson (1998) find that higher government salaries discourage corruption, Alt and Lassen (2014) find that relative wages have little impact on corruption, and Karahan, Razzolini and Shughart II (2006) find a positive relationship with wages when analysing a small sample of corruption cases in Mississippi.

Most of the studies that find a negative relationship between salaries and corruption suffer from measurement problems. One has a very small sample size (39 observations in Goel and Rich, 1989), another measures salaries indirectly as Gross Regional Product (GRP) per capita across Chinese provinces (Dong and Torgler, 2013), and two others use indirect proxies for corruption, by analysing examination scores (Borcan, Lindahl, and Mitrut, 2014) and hospital input prices (Di Tella and Schargrodsky, 2003). Moreover, most studies measure salaries as averages at the country or province level, which introduces considerable noise in the analysis. Finally, all studies that examine direct proxies for corruption invariably examine only one such proxy, mostly convictions across provinces in the US and China or complaints across provinces in Russia (Schulze, Sjahrir and Zakharov, 2016). However, as observed by Goel and Nelson (1998), even across U.S. states anti-corruption enforcement differs significantly. Conviction rates for abuse of public office by elected officials vary more than tenfold across U.S. states.

Studies that analyse cross-country data in Panel D also offer mixed results, most of them inconclusive, but none of these studies analyse direct measures of corruption. They focus on corruption perceptions (Dutt, 2009; Le, de Haan and Dietzenbacher, 2013; An and Kweon, 2017; Demirguc-Kunt, Lokshin and Kolchin, 2023; Herzfeld and Weiss, 2003; Treisman, 2000; Rauch and Evans, 2000; Panizza, 2001; Swamy, Knack, Lee and Azfar, 2001; Van Rijckeghem and Weder, 2001; Pellegrini and Gerlagh, 2008; Dahlström, Lapuente and Teorell, 2012) or attitudes towards corruption (Navot, Reingewertz and Cohen, 2016) obtained from published corruption perceptions indexes or questionnaire surveys. Salaries are also measured with considerable noise as averages at the country level.

Finally, the case studies in Panel E describe a relationship without reporting formal tests. Chand and Moene (1999) describe how increased salaries and anti-corruption enforcement were jointly associated with reduced corruption in tax collection agencies in Ghana in the 1990s. Using anecdotal observations from Soeharto's Indonesia, McLeod (2008) discusses how the regime offered very low salaries in order to make public sector employees financially dependent on corruption. Finally, Gong and Wu (2012) describe how convictions for corruption and average salaries increased in tandem in China in the 2000s.

3. Corruption and Related Institutional Background in Hong Kong

British ships anchored off the island of Hong Kong in 1839, marking the beginning of British colonial administration over the territory. Following the two Opium Wars, the island

was ceded to Britain with the Treaty of Nanking (1842), and the Kowloon peninsula opposite was annexed with the Peking Convention (1860). In 1898, an additional area encompassing the New Territories and several outlying islands was leased for 99 years. In 1984, with the lease expiration approaching, the UK and the People's Republic of China (PRC) signed the Sino-British Declaration, which stipulated the return of Hong Kong to China upon the expiration of the lease. Since 1997, Hong Kong has been administered as a Special Administrative Region (SAR) of the PRC. Under the *Basic Law*, the constitutional law governing the Hong Kong SAR, Hong Kong enjoys a high degree of autonomy. It has a border with mainland China, and its own currency. It retains the Common Law legal system with an independent judiciary and freedom of the press.

Table 2 reports general statistics about Hong Kong. The territory received large influxes of population in the 1930s and 1940s, following the Japanese invasion and civil war in China, and the population doubled again from 3.8 to 7.5 million from 1968-2020. Employment in the civil service increased from almost 73,000 in 1967 to over 177,000 in 2020. GDP per capita in constant HK$ increased tenfold during the same period. The city has developed into a major international financial center. Since the early 1990s, the local stock market has served as a gateway for Chinese companies to raise international capital. Trade with mainland China represented around 11% of Hong Kong's total exports and imports in 1975. This proportion has increased to over 50% since 2012. The proportion of the population aged over 15 with post-secondary education degrees surpassed 5% in 1990 and reached over 25% by 2020. The overall crime rate peaked in the mid-1990s, and has declined since. Hong Kong ranks consistently among the world's top 5-10% of countries or territories with the *least* corruption in many international rankings.[14]

3.1. Corruption in Hong Kong before 1974

Corruption has been endemic in Hong Kong from the beginning of British administration. In 1856, the Attorney General charged the Assistant Magistrate with accepting

[14] In 2020, Hong Kong ranked 11th (among 180) in Transparency International's Corruption Perceptions Index, tied with Australia, Canada, and the United Kingdom; 15th (among 185) in the Government Integrity sub-category (which measures corruption in the government sector) of the Index of Economic Freedom compiled by the Heritage Foundation, ahead of Austria, France, Germany, Japan, and the United States; 8th (among 128) in the Absence of Corruption sub-category of the Rule of Law Index compiled by the World Justice Project; and 20th (among 194) in the TRACE Bribery Risk Matrix compiled by TRACE International, ahead of South Korea, the United States, and France.

bribes from prisoners for lighter sentences.[15] Illegal gambling, prostitution, drugs, and other unlawful activities were identified as the main sources behind police corruption almost continuously during 1867-1939.[16] Corruption was widespread across many government departments and did not exist only among the police.[17]

After World War II, economic and social conditions remained conducive to corruption. Fast development, a *laissez-faire* economic attitude, and an influx of refugees (which caused overcrowding and shortages of necessary facilities) generated new sources of corruption. By the early 1970s, corruption permeated all aspects of life, and it was in plain sight. It existed "from womb to tomb."[18] It was both of the one-to-one "satisfied customer" type, and of the "syndicated" type (involving large corruption syndicates). In the private sector illegal commissions were common.

Syndicated corruption was in line with the coalitions modelled by Tirole (1986), which were characterized by side transfers, threats, and repetitive relationships. The overall environment of corruption also followed closely the high corruption equilibrium described by Akerlof and Yellen (1994), which was characterized by both lack of enforcement and consequently lack of community engagement in fighting corruption. Community tolerance for corruption was high and community cooperation with the police had been eroded, since the low probability of prosecution of corrupt individuals had reduced the willingness of the community to supply information. The significant profits from corrupt activity had increased the probability of retaliation by corruption syndicates, making the public unwilling to report corrupt activity. Lack of trust in the effectiveness of the anti-corruption authority was also significant. Informants considered the anti-corruption enforcement as ineffective, and where unwilling to provide information. Finally, the willingness of the public to cooperate with the anti-corruption authority also depended on the fairness of police procedures. When the innocent

[15] Scott and Gong (2019), pages 30-31
[16] "Votes and Proceedings of the Legislative Council of Hong Kong," *The Hong Kong Government Gazette*, Vol XIII, No 37 (30 August 1867); Welsh (1997), p 279; Minutes of the Legislative Council (5/19 March 1891); Minutes of the Legislative Council (24 October 1912; 26 October 1922; 10 November 1938); Perdue (1940)
[17] Public Works Department (O'Malley, Lister, and Johnson, 1884); immigration services (Correspondence from the Colonial Secretary's Office, *The Hong Kong Government Gazette*, 16 March 1895); various government departments (Minutes of the Legislative Council, 8 November 1897); tenders and inspections by the Sanitary Department (Hewett et al, 1907); ship's officers assisting smuggling activities (Minutes of the Legislative Council, 26 October 1922); the enforcement of import and export duties (Lloyd, 1924, 1926); the operation of illegal opium divans (Scott and Gong, 2019, page 35); the issuance of entry and residence permits to refugees from China (Minutes of the Legislative Council, 28 November 1940); and even the removal of human waste buckets from households in urban areas without sewers (Minutes of the Legislative Council, 6 March 1941).
[18] *ICAC Operations Department Report 2004,* page 6

were punished along with the guilty, as a result of retaliation, the public was unwilling to report corruption.

A local saying about the inevitability of corruption also highlighted the futility of expecting a solution: "get on the bus" (accept corruption and join us); "run alongside the bus" (at least do not interfere); but "never stand in front of the bus" (you will be knocked over).[19]

3.2. Anti-Corruption Enforcement until 1973

Bribery of public officers was an offence in Hong Kong under the English Common Law since 1843. In 1898, Hong Kong enacted the *Misdemeanours Punishment Ordinance*, which codified some of these common law rules. In 1948, the *Prevention of Corruption Ordinance* incorporated laws that had already been in effect in the UK. Corrupt acts in election settings were covered by the *Corrupt and Illegal Practices Ordinance* 1955.

By the late 1960s it was obvious that Hong Kong's legislation was not effective in curbing corruption. The UK Government appointed Charles Sutcliff as Police Commissioner in 1969, and Murray MacLehose as Governor in 1971, with a mandate to make changes. A new *Prevention of Bribery Ordinance* also became effective in 1971. It extended its provisions to both the public and the private sectors, and imposed criminal liability on both the offerors and the receivers of bribes. Two statutes proved of particular significance. First, it became an offence for a civil servant to possess wealth which was disproportionate to his official emoluments, with the burden of proof that the wealth was legally acquired placed on the defendant. This enabled the conviction of corrupt officials in cases where it was difficult to obtain evidence on specific bribery transactions. Second, the new legislation did not require a link between the acceptance of an advantage (widely defined to include from monetary rewards to other forms of favors) and a specific corrupt *quid pro quo* action taken as a result. It was enough for the prosecution to prove that the accused had received an advantage without permission. This law greatly facilitated prosecutions and convictions.[20]

Originally, corruption was investigated by the police like ordinary crime. In 1952, the police established a specialized unit to investigate corruption cases, which was made a separate formation in 1971, the Anti-Corruption Office (ACO) of the Royal Hong Kong Police (RHKP).

[19] Blair-Kerr (1973b).
[20] See Scott and Gong (2019), pages 16-17, 36-40.

The *Godber affair* in 1973 became the major catalyst for change. While under investigation by the ACO, and facing imminent arrest, Peter Fitzroy Godber, Deputy Police Commander of the Kowloon District, used his police-issued airport pass to bypass immigration controls and escape to London. The investigation uncovered that he was in possession of bank deposits five times larger than his aggregate emoluments in the 20 years he had served in Hong Kong. Godber's abscondment generated widespread public outcry and anti-corruption demonstrations. Governor MacLehose tasked Justice Blair-Kerr with public inquiries to establish the facts behind Godber's abscondment (Blair-Kerr, 1973a) and to assess the effectiveness of the existing anti-corruption framework (Blair-Kerr, 1973b). One of the issues examined was whether anti-corruption enforcement should remain within the police. Given long-standing public perceptions that the police was corrupt (reinforced by the Godber affair), there were political and psychological arguments in favor of a clean break from the past and the establishment of a new agency.[21]

3.3.The ICAC approach

The *Independent Commission Against Corruption* (ICAC) was established on February 15, 1974, following the enactment of the *Independent Commission Against Corruption Ordinance*. It was an independent agency, not part of the civil service, formally responsible directly to the Governor. To highlight its independence, it hired its own staff, and was not housed in government buildings.

The way the ICAC went about in fighting corruption followed closely the prescriptions of the low crime equilibrium model by Akerlof and Yellen (1994). The manipulation of social values regarding tolerance of corruption was as important in deterring corruption as strict legal enforcement. Altering public attitudes towards corruption became a major strategy for controlling it. Simultaneously, the higher probability of prosecuting corrupt individuals increased the willingness of the public to lodge corruption complaints. With low corruption, the rewards from and the probability of retaliation by the corruption syndicates declined, so that the public became more willing to cooperate with the anti-corruption authority. When informants trust that the anti-corruption authority will be effective, they become more willing to report corruption. Finally, as discussed previously, the public's willingness to inform depends on the fairness of the anti-corruption authority's procedures. When there is trust that

[21] Blair-Kerr (1973b), p 51.

only the guilty will be prosecuted, and the innocent will be spared, the public will be more willing to report corruption.

The ICAC developed a three-pronged approach to tackle corruption, each assigned to one of its three departments:

1. The **Operations Department** is tasked with receiving, investigating, and prosecuting complaints alleging corruption offences. ICAC investigative officers have the same powers of investigation, search, arrest, and detention typically observed in police forces and can carry firearms. The ICAC can investigate and prosecute *all* crimes its corruption investigations uncover, even those that do not directly involve corruption. This empowers it to deal with offences comprehensively, and offers a better chance of bringing wrongdoers to justice.[22]
2. The **Corruption Prevention Department** conducts "audits" of draft legislation, government departments, public bodies, professional associations or private companies/organizations, in order to identify processes which may be conducive to corruption and make suggestions on how corruption opportunities can be eliminated.
3. The **Community Relations Department** is tasked with educating the public on the evils of corruption using diverse means. It also handles international liaison activities.

From its establishment, the ICAC gained the trust of the public. The number of corruption-related complaints *tripled* in the two years following the establishment of the ICAC (see Figure 1). The public also channeled a large number of *non-corruption related complaints* through the ICAC (Figure 2). During 1968-1973, the Anti-Corruption Office of the police received close to 400 non-corruption related complaints. During 1974-1976 the ICAC received 8,800 corruption related complaints but more than 11,000 non-corruption related complaints. The public viewed the new agency as an ombudsman who could help address grievances beyond corruption. They trusted that complaints would be taken more seriously if forwarded through the ICAC.[23] Before the establishment of the ICAC, two-thirds of corruption complaints received were anonymous. Complainants worried about potential reprisals from the perpetrators. By 1977, more than 50% of the complaints were eponymous, and 10 years later

[22] Corruption investigations often lead to charges not for the bribery itself, but for crimes that are easier to prosecute, such as accounting fraud. See the example of BAE's contracts in Saudi Arabia (Timeline: BAE corruption probe, 26/06/2007; Blair defends Saudi probe ruling, 15/12/2006, BBC News, www.news.bbc.co.uk; U.S. launches corruption probe into Britain's BAE, 26/06/2007, Reuters, www.reuters.com; BAE pays fines of £285m over arms deal corruption claims, 05/02/2010, The Guardian, www.guardian.co.uk).

[23] The number of non-corruption complaints dropped after the Office of the Ombudsman was established in 1989.

this percentage had reached two-thirds or more. The percentage of respondents in the ICAC's opinion surveys willing to report corruption increased from around 30% in 1988 (the first year the question was asked) to over 80% in 2020 (another 10-20% of respondents answer that they might report corruption depending on circumstances).

Hong Kong's judiciary assisted in fighting corruption. The courts were willing to hand down prison sentences that could be viewed as deterrents to prospective corrupt individuals.[24] Pre-ICAC, between 16-74 persons were prosecuted for corruption annually, and the number increased to 108-643 persons during 1974-2019 (see Figure 3). ICAC eradicated organised syndicated corruption in less than 10 years,[25] and then the focus shifted to the private sector. By 1979, the majority of prosecuted persons were private citizens, as opposed to civil servants, and by 1988 the majority of complaints received from the public involved the private sector (see Figure 4).[26]

Hong Kong's anti-corruption laws remained unchanged when it returned to the PRC. ICAC's independence was enshrined in Article 57 of the *Basic Law*, which makes the ICAC Commissioner directly responsible to the Chief Executive of the Hong Kong SAR. Currently, anti-corruption legislation consists of the *Prevention of Bribery Ordinance* 1971, the *Elections (Corrupt and Illegal Conduct) Ordinance* 2000, and the *Independent Commission Against Corruption Ordinance* 1974 (and their amendments). Over the past 20 years, the ICAC has also made prosecutions on the basis of the common law offence of *misconduct in public office* against public officials who misuse their office for personal gain without committing direct bribery offences.[27]

The ICAC's efforts have been successful in transforming Hong Kong from one of the most corrupt territories in the world to one of the cleanest. According to ICAC's opinion surveys, the percentage of respondents that consider corruption as very/quite common in Hong

[24] See relevant Court of Appeal decisions in 1983 (quoted in *ICAC Annual Report 1983*), and 2012 (*Secretary for Justice V Tang Shu Cheong [2012] 5 HKLRD 458*).
[25] *ICAC Annual Report 1983*
[26] In the 1980s, the ICAC prosecuted large scale fraud involving financial institutions and the former Chairmen of the Hong Kong Commodities Exchange and the Stock Exchange of Hong Kong. These investigations led to the establishment of the Securities and Futures Commission (SFC) in 1989 to regulate the financial sector. With changing conditions, the focus of investigations shifted to involve counterfeit credit card fraud, health insurance fraud, international illegal bookmaking syndicates, the financial sector in the aftermath of the 1997 Asian Financial Crisis, the construction industry, and publicly listed company directors (in 2006-2007, 39 listed companies were investigated, 3 were delisted, and 8 had their shares suspended following ICAC prosecutions for corruption facilitated fraud).
[27] The UN Convention Against Corruption (UNCAC) was extended to Hong Kong in 2006. Hong Kong participates in the United Nations Convention Against Transnational Organised Crime, and the Financial Action Task Force on Money Laundering (FATF).

Kong declined from 84% in 1977 (the first year the survey was conducted) to around 25% in 2020, and 98.4% of respondents had not encountered corruption personally. In 2020, Hong Kong was ranked as the 11th least corrupt country or territory worldwide in the Corruption Perceptions Index compiled by Transparency International, tied with Australia, Canada, and the United Kingdom.

4. Data, variables, and descriptive statistics

Our study requires measures of actual corruption activity, average salary, proxies for opportunities for corruption and other control variables, all at the departmental level. We discuss the sources of data and the definitions of the main variables below. We also tabulate this information in Appendix A. All observations are at the department-year level. We note that, following the onset of the Covid-19 pandemic, Hong Kong was subject to strict lockdowns, quarantines, and travel restrictions from early 2020 until late 2022, which limited contact between people and government departments. Corruption complaints against government departments and public bodies declined by almost 35% during 2019-2022, as contact between citizens and the government was reduced. We end our sample in 2019, to avoid the impact of the pandemic.

4.1.Measuring corruption at the departmental level

We analyse four measures of corruption, namely corruption complaints forwarded to the ICAC by the public or other government bodies, number of persons prosecuted for corruption, number of persons convicted of corruption offences, and aggregate amounts of bribes accepted or solicited. In all cases the perpetrator (person against whom a complaint has been made, person prosecuted or convicted, person who received or solicited the bribe) must be an employee of a government department or other public body/agency. Numbers are aggregated annually by department. For the first three measures, the numbers pertain to the year that the complaint was made, the person was prosecuted or convicted.

We obtain annual data on corruption complaints, prosecutions, and convictions, classified by government department, primarily from *ICAC Annual Reports* (1974-2019). For years with missing data, we supplement with figures reported in submissions by ICAC to Hong Kong's Legislative Council (LegCo) and replies to LegCo questions (1995-2020) (https://www.devb.gov.hk/en/legco_matters/replies_to_legco_questions/index.html). In

robustness tests, we also supplement with data for 1968-1973 obtained from the report of the commission of inquiry that preceded the establishment of the ICAC (Blair-Kerr, 1973b).

We obtain data on bribe amounts solicited or paid by analysing the universe of all 7,169 press releases made by ICAC during 1974-2017.[28] By reading ICAC press releases we identify whether the receivers of bribes work for a government department and what amounts were paid as bribes. We also identify the *exact year that the bribe was paid* (not the date of the press release). Bribe amounts have been allocated to the exact year that they were paid. We include only bribes that were actually solicited by or paid to a government official (we exclude bribes that were offered to a government official but were refused). We aggregate the dollar bribe amounts by department each year.

4.2.Measuring government employee salaries at the departmental level

We estimate average salaries by department by dividing aggregate expenditures on staff emoluments by the number of staff employed by the department. We obtain actual annual expenditures on staff emoluments for each department and the number of established positions (establishment) from the respective *Controlling Officer's Report* in the *Estimates of Revenue and Expenditure* submitted annually with the Hong Kong SAR Government Budget (1973-2022). Annual departmental expenses on personal emoluments are the sum of reported salaries, allowances, and job related allowances. We obtain historical actual staffing levels (strength) for each government department from the *Civil Service Bureau*.[29]

The number of staff employed in the department is based on the actual number of staff employed (*strength*). In cases where the actual strength is missing but the number of available positions in the department is available, whether they are filled or not (*establishment*), we estimate staffing by multiplying the establishment figure by the median of the nearest 5 years of available strength-to-establishment ratios for the department in question.[30] For departments

[28] We thank the ICAC for providing us with the historical press releases that are no longer in the public domain.
[29] We thank the Civil Service Bureau for making the data available to us.
[30] Generally, actual staff strength across departments in Hong Kong is around 95% of established positions and this percentage does not show significant variation from year to year. Our staffing series consists of 87% observations of actual strength and 13% estimated strength based on established positions and strength-to-establishment ratios. Our results are qualitatively similar if we use only actual staffing series to estimate average salaries.

or agencies that publish their own annual reports, we obtain additional staff emoluments and strength data from their annual reports. [31]

Hong Kong's financial year for budget purposes is from April 1 to March 31 of the following year. When necessary to match data obtained from the budget estimates with series reported on a calendar basis, we match data reported on March 31, with data reported on December 31 of the previous year. For example, budget data reported for fiscal year-end March 31, 2019 are matched with other data reported for calendar year-end December 31, 2018.

4.3.Control variables

We control for differences in the opportunities to engage in corrupt activities across departments by aggregating the number of assignment reports undertaken by ICAC's Corruption Prevention Department (CPD), over the past 5 years. The CPD provides advice across the public sector on regulations and processes that create opportunities for corruption, in order to eliminate such opportunities. This advice may be requested by the department in question, but may also be initiated at the discretion of the ICAC, for example, when it observes significant corruption activity in a given department. The advice takes the form of assignment studies (reports) conducted by the CPD. It is possible that a given department may receive more than one such assignments annually, examining different aspects of its operations. These assignment reports are listed in *ICAC Annual Reports* (1974-2019).

Finally, we use a number of economy-wide variables in a few specifications. Data on corruption perceptions in Hong Kong (the percentage of respondents who consider corruption "common" and "very common" or "quite common"), and willingness to report corruption (the percentage of respondents who provide unequivocal answer that they would report corruption if it came to their attention) are obtained from the *ICAC Mass Survey* (1977-1990), and the *ICAC Annual Survey* (1992-2020).[32] Overall criminality (the number of non-corruption criminal cases reported to or handled by the Hong Kong Police), post-secondary education attainment (the percentage of population aged 15 and over with post-secondary degrees), trade with Mainland China (the proportion of exports plus imports conducted with Mainland China),

[31] Communications Authority, Companies Registry, ICAC, Hong Kong Monetary Authority, Hong Kong Post, Hospital Authority, Housing Authority, Kowlooon-Canton Railway Company, Land Registry, Legislative Council Commission, Office of The Ombudsman.

[32] We thank the ICAC for making the complete opinion surveys available to us. While the ICAC announces publicly a summary of the results every year, the complete surveys are not in the public domain. In years with missing data we extrapolate the figure to the mid-point of the last available and next available figures. The ICAC conducted its first mass survey in 1977. We use the 1977 figures for 1974-1976.

GDP per capita (GDP divided by population), annual GDP growth rate (and other variables used in robustness tests that are not reported in tables) are obtained from *Annual Digest of Statistics* editions (1967-2021) published by Hong Kong's *Census and Statistics Bureau*. All monetary amounts throughout the study are expressed in constant 2020 HKD using the implied GDP deflator.

4.4.Descriptive statistics

Appendix B reports a list of government departments, agencies, and public bodies in our sample, aggregate corruption activity involving their staff, the average number of assignments studies conducted by the ICAC's CPD, and average salary levels. Overall, we have data on salaries and corruption for 90 departments, and they are ranked in declining number of corruption complaints received. Out of a total of 41,540 corruption complaints, 2,196 corruption-related prosecutions, and 933 convictions during 1974-2019, 58%, 50%, and 45% respectively are recorded by the police, with each of the other departments experiencing significantly fewer cases. Departments that have experienced more corruption activity have also received more CPD assignment studies. The police has received almost 3 such studies per year, on average, examining different aspects of its operations, and the Housing Department (with the 2nd highest number of corruption complaints in the sample) almost 4. In contrast, departments that have not received any corruption complaints over the sample period (at the bottom of the table) have also received few (if any) CPD assignments. Overall, the ICAC has conducted 2,476 assignment studies covering the 90 departments in our sample. [33] Average salaries across departments show significant variation.

Table 3 reports the number of departments with data annually. Post-1974, the number of departments with both corruption and salary data in our sample ranges from a low of 43 departments (in 1976) to a high of 67 departments (in 1998-2000), with the median year in the sample having data for between 61-62 departments. These numbers are driven by the number of departments with available data in order to estimate average annual salaries. The number of departments with corruption data is always larger and ranges from 55 departments (during 1977-1980) to 81 departments (during 2000-2002). The pre-1974 data pertain exclusively to the police, and are not used in the main analysis but only in robustness tests.

[33] Whenever an assignment report covers practices in more than one department, it has been assigned to each of the departments covered. So, this number exceeds the total number of assignment reports listed in the ICAC Annual Reports.

5. Main results: Departmental corruption and civil service salaries

In this section we report our main results on the relationship between departmental corruption and civil service salaries. We first examine the relationship between levels of corruption and salaries, where corruption is measured by complaints, prosecutions and convictions (Section 5.1), followed by analysis of first differences (changes) in corruption and salaries (Section 5.2). Our main tests estimate Heckman two-stage equations on percentage first differences (Section 5.3), and similar equations for bribe amounts (Section 5.4). We note that more than 50% of the number of complaints, prosecutions and convictions in the sample involve police officers (see Appendix B). This creates an outlier problem in levels specifications, so Sections 5.1-5.2 exclude the police. However, we include the police in our main specifications in Sections 5.3-5.4. Moreover, we examine separately the police in robustness tests (Section 6.2).

5.1. Salary levels and the level of complaints, prosecutions and convictions

Table 4 reports preliminary findings on the relationship between corruption levels (complaints, prosecutions, convictions) and salary levels. These specifications generally follow the specifications on levels of most of the previous literature (see, for example, Goel and Nelson, 1998; Dong and Torgler, 2013; Schulze, Sjahrir and Zakharov, 2016; Chen and Liu, 2018; Alt and Lassen, 2014; Karahan, Razzolini, and Shughart, 2006). If salary levels enter in the perpetrator's calculation on whether to engage in corrupt activity, it is the salary prevailing at the beginning of this activity (not when the case was prosecuted or convicted) that is relevant for our purposes. Based on an analysis of the universe of ICAC press releases that report corruption cases during 1974-2017, in around 70% of the reported cases, the time interval from the time the corrupt activity started until the case reached court proceedings is 3 years. Therefore, in all specifications that measure corruption in terms of complaints, prosecutions and convictions, we lag salaries by 3 years. We report robustness tests using different lags later.

All salary measures in the paper are expressed in constant 2020 Hong Kong dollars. All specifications control for corruption opportunities and staffing levels. The CPD reports variable, which proxies for corruption opportunities, is the sum of such reports received by the

department in the past 5 years, a period which straddles the 3-year lag for salaries. All specifications include department and year fixed effects. Standard errors are heteroscedasticity-consistent and two-way clustered by department and year.

In Panel A, all variables are expressed in natural logs. In columns 1-3, departmental complaints, prosecutions and convictions represent annual figures for the 3rd year following the salary measure. In columns 4-6, the corruption variables represent the *sum* of complaints, prosecutions and convictions over the 3 year period following the salary measurement. While the coefficients of the lagged level of departmental salary are negative in all columns, they are statistically significant at conventional levels only for prosecutions and convictions.

In Panel B, departmental corruption levels are measured per capita (by dividing by the staffing level in the department). Effectively, they represent the percentage of the department's employees that engage in corrupt activity. Similarly, departmental salaries are measured as percentage deviations from the average salary across all departments with available data that year. Demirguc-Kunt, Lokshin and Kolchin (2023) suggest that wage inequality matters when examining the relationship between salaries and corruption. This measure also deflates departmental salaries for general increases of civil service salaries in real terms over time. The results are even stronger than in the previous panel. There is a negative and statistically significant relationship between departmental corruption activity and lagged departmental salaries across five out of the six columns in the table, both when analysing annual corruption levels (columns 1-3) and sum of 3 years of corruption activity (columns 4-6).

Overall, our preliminary results confirm a negative relationship between departmental salaries and departmental corruption activity. They suggest that departments with higher salaries experience fewer corruption cases, after controlling for departmental corruption opportunities and staffing levels.

Treisman (2007) suggests that one of the problems with the current literature is that it is not known with what lag political or economic variables affect corruption. Table 5 examines the robustness of the results to different lags for the salary measure. It reports the coefficients of the salary variable from estimating the specifications of Table 4, Panel A, columns 1-3 and Table 4, Panel B, columns 1-3 for different salary lags (ranging from contemporaneous measures to 5-year lags). Control variables are estimated but not reported. The coefficients of the 3-year lag specifications are identical to those in the first row of Table 4. Coefficients statistically significant at better than the 10% level are highlighted in bold font. Overall, we

observe negative coefficients between our salary measures and departmental corruption in 35 out of 36 specifications, with results stronger for prosecutions (5 statistically significant lags out of 12 specifications) and convictions (7 out of 12), but across all measures the *p*-values are generally lower when lagging salaries for 3 years, in line with our expectation from analysing the press releases.

5.2. Analysis of first differences in salary and corruption complaints, prosecutions and convictions

In this section, we address potential omitted variables problems by regressing percentage changes in corruption to percentage changes in salaries (first differences). The results are reported in Table 6. Given that a 3-year lag for salaries was used previously, we include two salary change variables, capturing percentage changes in salaries from *t*-4 to *t*-3 and for *t*-3 to *t*-2. Changes in corruption are measured from *t*-1 to *t*. In Panel A, changes in corruption measures are also expressed in percentages, whereas in Panel B they are expressed in integers. The specifications control for starting level of salary (*t*-4) and starting level of complaints, prosecutions and convictions (*t*-1) in natural logs.

Overall, the negative relationship between departmental salaries and departmental corruption is robust to these alternative specifications. In Panel A, both salary changes show a negative coefficient (statistically significant at better than the 10% level) for explaining changes in convictions in column 3, one of the two shows a negative coefficient (statistically significant at better than the 5% level) for changes in complaints in column 1, and one of the two shows a marginally insignificant coefficient (*p*-value 0.119) for prosecutions in column 2. In Panel B, both coefficients are statistically significant in columns 3, one becomes significant in column 2 (prosecutions), and those in column 1 become insignificant. These results are in line with the regressions of levels in the previous section.

5.3. Heckman two-stage equations of first differences (prosecutions and convictions)

It is possible that the previous analysis suffers from selection bias as the sample may not be randomly generated. For example, only cases that have been prosecuted will generate convictions, and most of the cases prosecuted have likely started as complaints. To address this potential sample selection bias, in our main specifications in this section, we replicate the analysis by estimating Heckman two stage models for the effect of departmental salaries on prosecutions and convictions.

The results are reported in Table 7. In the 1st stage (Panel A), we model the likelihood of the department receiving at least one corruption complaint and having at least one prosecution in year *t*. These specifications include departmental salary levels, the deviation of departmental salaries from average salaries across the entire civil service, our proxy for corruption opportunities, and staffing levels. In addition, we include dummy variables indicating whether the department has received corruption complaints in past years. Moreover, columns 1-2 include economy-wide variables that may have an impact on the likelihood of receiving complaints and conducting prosecutions. These include overall criminality (annual number of non-corruption cases handled by the police), education levels (percent of adult population with post-secondary education degree), GDP growth rate, GDP per capita, trade with the Mainland (as a proportion of total trade), corruption perceptions in society (from ICAC's annual surveys), and willingness to report corruption (from the same surveys). These are lagged for 3 years, following the salary variables. These specifications cannot be estimated with fixed effects. In contrast, columns 3-4 include department and year fixed effects without the economy-wide variables. We observe that relative departmental salaries are negatively related to the likelihood of complaints and prosecutions in all 1st stage specifications.

In the 2nd stage (panel B), we examine the impact of percentage changes in departmental salaries on percentage changes in prosecutions and convictions respectively. This is our main result, after correcting for potential selection bias. These specifications include the usual control for corruption opportunities, in addition to levels of lagged salary, staffing, complaints, prosecutions and convictions. Moreover, columns 1-2 include the economy-wide controls, whereas columns 3-4 include department and year fixed effects.

When we examine the economy-wide control variables in columns 1-2, we observe that prosecutions and convictions for corruption are positively correlated with overall (non-corruption) criminality, with corruption perceptions as reflected in surveys, and with the willingness of the public to report corruption activity. These results are not surprising.

More importantly, we observe a strong negative relationship between lagged percentage changes in departmental salaries and future percentage changes in prosecutions and convictions for corruption across all specifications (in addition, the level of salary is also negatively related to the percentage changes in future convictions). One coefficient is statistically significant at the 10% level and the remaining are close or better than the 1% level. The results suggest that salary increases lead to less corruption down the road. In addition to

being statistically significant, the results are economically significant too. Based on the coefficients in the first two rows, a 10% (0.1) increase in departmental salary over 2 years (5% each year), is associated with a 4% reduction in prosecutions, and between 7.5% and 21% reduction in convictions 3 years later.

5.4.Heckman two-stage equations of dollar bribe amounts

The previous analysis used complaints, prosecutions and convictions as corruption proxies. In this section, we analyse a fourth proxy for corruption, namely the aggregate dollar value of bribes received or solicited by the department's staff. We identify dollar amounts for bribes by analysing the universe of all 7,169 press releases made by ICAC during 1974-2017. We first identify press releases that refer to actual corruption cases (approximately 75% of the total), and then we identify whether the receivers of bribes work for one of the government departments in our sample, and what amounts were paid as bribes. We include only bribes that were solicited by the government official or accepted by the government official. These amounts reflect the estimate by the government official of how much the "service rendered" was worth. We exclude bribes that were offered but were refused (for example, when the official alerted the authorities and filed the complaint), because we are interested in the decision of the official to become corrupt. We also identify the exact year that the bribe was paid. Bribe activity and amounts have been allocated to the exact year when they were paid (*not* on the date of the press release). We aggregate the dollar bribe amounts by department each year. All monetary figures have been converted to constant 2020 HKD using the implied GDP deflator.

This analysis is reported in Table 8. We note that in the case of dollar bribe amounts derived from the press releases, we know the exact date when the bribe was paid. Therefore, we can regress the departmental bribe amounts on contemporaneous departmental salaries (there is no need to lag salaries, as in the case of complaints, prosecutions and convictions, where the exact date that the corrupt activity took place was unknown).

This analysis may suffer more from selection bias, since in order for a bribe amount to be recorded in year *t*, there must be at least one active (on-going) corruption case occurring in year *t* that involves departmental staff and has been described in an ICAC press release. Therefore, we employ again the Heckman two-stage approach, where in the 1st stage (Panel A) we model the likelihood of an active on-going corruption case reported in an ICAC press release. In addition to the departmental controls estimated in the previous section, we include lagged dummy variables that indicate on-going corruption cases in previous years, the number

of press releases issued by ICAC that year that pertain to the department and the total number of press releases that the ICAC has ever issued describing cases that involve staff from the department. Finally, in column 4, we also include the economy-wide controls from the previous section.

Panel B reports the main results, after controlling for possible selection bias, namely coefficients from regressions of dollar bribe amounts per departmental staff (column 1), dollar bribe amounts per perpetrator involved in the case (column 2),[34] and percentage changes in aggregate dollar bribe amounts received by all departmental staff (columns 3-4) on departmental salary levels, deviations from average civil service salary, and percentage changes in departmental salaries. Dollar bribe amounts and salary change variables measure percentage changes from year t-1 to t.[35]

Percentage deviations of the department's salary from average salary across the civil service is negatively related to dollar bribe per departmental staff and dollar bribe per perpetrator in the case in columns 1-2. Percentage changes in salary are also negatively related to percentage changes in aggregate dollar bribe amounts received by departmental staff in columns 3-4. All coefficients are statistically significant at better than the 5% level. These results are in line with the results of the previous section, where corruption was measured by number of complaints, prosecutions and convictions. Results are also economically significant. Based on columns 3-4, a 10% increase in departmental salaries is associated with a 3.4% to 4.9% reduction in the aggregate dollar bribe amount accepted or solicited by departmental staff.

In Table 9, we perform a robustness test where we treat each departmental corruption case as a separate observation and estimate a cross-sectional regression of dollar bribe amounts and dollar bribe amounts per perpetrator on levels and deviations from average salary respectively. These specifications are similar to Goel and Rich (1989). Therefore, amounts have not been aggregated by department and each case is treated as an independent observation. We observe that both the level of salary and the deviation of the departmental salary from average civil service salaries are negatively related to dollar bribe amounts. All coefficients are statistically significant at the 5% level or better. As an additional robustness test, column 5

[34] It is possible that more than one person received bribes in a single case.
[35] Annual changes in aggregate dollar bribe amounts for each department can show extreme variations in certain cases (unlike the numbers of cases in previous specifications). Therefore, we winsorize these amounts at the top and bottom 1%.

includes not only bribes that were solicited or accepted but also bribes that were offered but were rejected by the government official. The results are qualitatively similar.

In summary, our main Heckman specifications show a strong negative relationship between departmental salaries and corruption. Increases in salary are associated with reductions in corruption activity. Our results appear robust to measuring corruption as complaints, prosecutions, convictions or dollar bribe amounts, controlling for the opportunities for corruption in each department, including year and department fixed effects or economy-wide controls.

6. Robustness tests

Our results so far show a strong negative relationship between departmental salaries and departmental corruption that is robust to different proxies for corruption and different specifications. In this section, we perform a number of additional robustness tests. First, we estimate co-integrating equations between corruption measures and salaries (Section 6.1), followed by an analysis of the relationship between salaries and corruption in the police, which allows us to extend our sample period back to 1968, before the establishment of the ICAC (Section 6.2). Finally, we estimate logit models of the likelihood that a department has experienced at least one corruption case during our sample period (Section 6.3).

6.1. Co-integration

In our preliminary analysis of levels, an Augmented Dickey-Fuller Test rejects the null hypothesis of no co-integration. While this is not a problem in our main specifications that use differences, as an additional robustness test we estimate co-integrating equations of levels of corruption complaints, prosecutions, convictions, and aggregate dollar amounts on lagged salary levels. The results are reported in Table 10, using both panel fully modified least squares (FMOLS) and panel dynamic least squares (DOLS) estimation. With the exception of corruption complaints in column 1, all other corruption proxies exhibit a highly statistically significant negative relationship with departmental salaries. This is in line with our main results.

6.2. Corruption in the police

In this section, we conduct an analysis of the relationship between salaries and corruption in the police. Given that the police constitutes an outlier according to the number of complaints, prosecutions and convictions received (see Appendix B), we also examine it separately. Moreover, this allows us to extend our sample on prosecutions and convictions (but not complaints) back to 1968, before the establishment of the ICAC, by including data obtained from the independent public inquiry that was conducted in the aftermath of the Godber affair (Blair-Kerr, 1973b).

The results are reported in Table 11. Due to the small sample size, we include only a subset of the control variables that we use in previous specifications and we cannot include fixed effects. We control for lagged salary, staffing, complaints, prosecutions and convictions, we include a dummy variable for the period after the ICAC establishment, and we also control for overall (non-corruption) criminality. In line with the results in the rest of the paper, we obtain negative coefficients, both for the level of salaries in explaining the level of corruption and for the percentage changes in salaries in explaining changes in the number of corrupt actions.

6.3. Likelihood that the department reports at least one corrupt case in the 1974-2019 period

In this section, we estimate logit models of the likelihood that the department reports at least one corruption case in the entire 1974-2019 period. In these logits, all 46 department-year observations are equal to 1 if there's at least one non-zero year for the department in question in the entire 46 year sample period (these are different logits than the ones in the 1st stage of the Heckman approach where the department-year dependent variable equals 1 if there are positive corruption cases *in that year*).

The results are reported in Table 12. We report specifications for corruption complaints (Panel A), prosecutions (Panel B), and convictions (Panel C), both for the absolute level of salary and for salary deviations from the average across all departments in the civil service, and include either year fixed effects or economy-wide variables as in previous specifications. In all 12 specifications, we observe a negative and statistically significant at the 1% level coefficient for the salary variables. Departments where salaries are lower experience at least one corruption case and departments where salaries are higher do not experience corruption cases.

7. Conclusions

The relationship between civil service salaries and corruption has occupied the minds of policy-makers and academics for a very long time. Neither policy nor academia offer conclusive insights. Previous studies on the relationship between government official salaries and corruption find mixed results. The theoretical literature and studies that report the results of controlled experiments invariably find that higher salaries limit corruption, but studies that use real world data offer inconclusive results.

Our study analyses more granular data compared to other studies that use real world data, by comparing corruption and salaries across different government departments in Hong Kong, thus keeping institutional, enforcement, cultural and other economy-wide factors constant. Moreover, our data allows us to control for different corruption opportunities offered by different departments.

We find a strong negative relationship between average departmental salaries and four different measures for corruption (complaints received from the public by the anti-corruption authority, prosecutions, convictions, and dollar bribe amounts accepted or solicited by civil servants). The relationship is robust to examining levels as well as percentage first differences, and is also robust to a number of different specifications. We conclude that increasing civil servant salaries does reduce corruption. Based on our estimates, a 10% increase in salary leads to a 4% reduction in prosecutions, between 7.5% and 21% reduction in convictions (three years later), and between 3.4% to 4.9% reduction in aggregate bribe amounts solicited or accepted (after one year). Unlike the inconclusive results obtained in previous studies that use real world data, our results using our more granular data are strongly in line with the controlled laboratory experimental evidence in previous studies.

During the period of our study Hong Kong had strict anti-corruption enforcement through the work of the ICAC, a straightforward anti-corruption legislation that facilitated the work of prosecutors, and an independent (largely non-corrupt) judiciary that was willing to hand down harsh punishments to convicted individuals. Therefore, potentially corrupt civil servants had a lot to lose if found out. Under these conditions, our results suggest that higher salaries could lead to lower corruption. It is an open question whether the results would hold in an environment that made it unlikely for corrupt officials to face repercussions for their corrupt actions.

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Table 1: Previous literature on the relationship between salaries and corruption

Study	Country of data	Sample duration	Sample size	Measurement of corruption	Measurement of salary	Relationship between salary and corruption
A. Theoretical						
Becker and Stigler (1974)	n/a	n/a	n/a	n/a	n/a	–
Cadot (1987)	n/a	n/a	n/a	n/a	n/a	–
Barro (1973)	n/a	n/a	n/a	n/a	n/a	– [a]
Besley and McLaren (1993)	n/a	n/a	n/a	n/a	n/a	– [a]
Sosa (2004)	n/a	n/a	n/a	n/a	n/a	–/+ [a]
B. Empirical: Experimental evidence						
Azfar and Nelson (2007)	USA	n/a	96	Bribe amount	Individual wage	–
Armantier and Boly (2011)	Burkina Faso	n/a	247	Bribe amount	Individual wage	–
Van Veldhuizen (2013)	Netherlands	n/a	76	Bribe amount	Individual wage	–
Abbink (2000)	Germany	n/a	24	Bribe amount	Individual wage	No effect
Barr, Lindelow and Serneels (2009)	Ethiopia	n/a	144	Bribe amount	Individual wage	No effect
C. Empirical: Real-world within-country data						
Goel and Rich (1989)	USA	1970-83	39	Convictions	Federal, state, local level	–
Goel and Nelson (1998)	USA	1983-87	50 states	Convictions	Federal, state, local level	–
Dong and Torgler (2013)	China	1998-07	31 provinces	Convictions	Province level (GRP per capita)	–
Borcan, Lindahl, and Mitrut (2014)	Romania	2007-10	850 schools	Exam scores	Country level (public sector)	–
Schulze, Sjahrir and Zakharov (2016)	Russia	2004-13	79 provinces	Complaints	Province level	–
Di Tella and Schargrodsky (2003)	Argentina	1996-97	544	Hospital supplies prices	Individual level (survey)	–/No effect [b]
Chen and Liu (2018)	China	1985-14	30 provinces	Bribe amounts	Province level	U-shaped
Mishra, Subramanian and Topalova (2007)	India	1987-03	328,090	Tariff evasion	Country level (customs staff)	No effect
Alt and Lassen (2014)	USA	1977-03	50 states	Convictions	State level	No effect
Karahan, Razzolini, and Shughart (2006)	USA	1984	82 counties	Convictions	County level (supervisors)	+
Foltz and Opoku-Agyemang (2015)	Ghana	2006-12	47,499	Bribe amounts (survey)	Country level (police)	+
D. Empirical: Real world cross-country data						
Dutt (2009)	Multiple	2000	49 countries	Corruption perceptions	Country level	–
Le, de Haan and Dietzenbacher (2013)	Multiple	1989-00	76 countries	Corruption perceptions	Country level	–
An and Kweon (2017)	Multiple	1999-08	43 countries	Corruption perceptions	Country level	–
Demirguc-Kunt, Lokshin and Kolchin (2023)	Multiple	2000-19	36 countries	Corruption perceptions	Country level	– /+ [c]
Herzfeld and Weiss (2003)	Multiple	1982-97	130 countries	Corruption perceptions	Country level	–/No effect

Treisman (2000)	Multiple	1996-98	36 countries	Corruption perceptions	Country level	No effect
Rauch and Evans (2000)	Multiple	1990	32 countries	Corruption perceptions	Country level	No effect
Panizza (2001)	Multiple	1981-99	27 countries	Corruption perceptions	Country level	No effect
Swamy, Knack, Lee and Azfar (2001)	Multiple	1981-91	93 countries	Corruption perceptions	Country level	No effect
Van Rijckeghem and Weder (2001)	Multiple	1982-94	31 countries	Corruption perceptions	Country level	No effect
Pellegrini and Gerlagh (2008)	Multiple	2004	106 countries	Corruption perceptions	Country level	No effect
Dahlström, Lapuente and Teorell (2012)	Multiple	2008	47 countries	Corruption perceptions	Country level	No effect
Navot, Reingewertz and Cohen (2016)	Multiple	2014	18,800	Attitude towards corruption	Individual level (survey)	+
E. Empirical: Country case studies						
Chand and Moene (1999)	Ghana	1960-94	Case study	Tax revenues/GDP	Country level (tax authority)	–
McLeod (2008)	Indonesia	1968-98	Case study	Public sector budgets	Country level (public sector)	–
Gong and Wu (2012)	China	1999-08	Case study	Convictions	County level	+

Notes:

[a] Under certain conditions

[b] – under a low enforcement regime, no effect under a high enforcement regime

[c] – under low wage inequality, + under high wage inequality

Table 2: Descriptive statistics about Hong Kong

The table reports descriptive statistics about Hong Kong's economy and society. Unless otherwise stated, sources of data appear in Appendix A.

Year	Population	GDP (mil HKD 2020)	GDP growth rate (% average of past 5 years)	GDP per capita (HKD 2020)	Total crime reports to police	Civil service strength	Trade with mainland China as % of Hong Kong's total trade	Population aged over 15 with post-secondary education degree (%)	Newspapers (number)	Corruption Perceptions % (ICAC Survey)	Willingness to Report Corruption % (ICAC Survey)	Transparency International Corruption Perceptions Index Ranking	Heritage Foundation Government Integrity Ranking (sub-category of the Index of Economic Freedom)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1961	3,168,100	108,148		34,137	15,189		11.4	2.2	40				
1965	3,597,900	178,194	13.3	49,527	20,007	72,936 [a]	15.4	2.7	40				
1970	3,959,000	231,713	8.7	58,528	29,052	81,438	8.6	2.6	70				
1975	4,461,600	317,777	14.0	71,225	56,520	104,157	11.0	3.1	107	97.6 [b]	29.6 [b]		
1980	5,063,100	548,447	20.7	108,322	75,754	139,252	10.5	3.4	97	54.5	38.6		
1985	5,456,200	724,438	12.6	132,773	86,944	174,946	25.8	4.2	66	40.7	35.0		
1990	5,704,500	1,051,309	15.6	184,295	88,300	190,448	30.8	5.6	72	42.0	30.7		
1995	6,156,100	1,360,983	11.7	221,079	91,886	182,675	34.8	8.2	59	50.6	61.4	17	1
2000	6,665,000	1,549,017	2.2	232,411	77,245	180,968	38.9	11.4	59	42.1	64.7	15	18
2005	6,813,200	1,904,942	0.8	279,596	77,437	155,019	45.0	15.1	49	29.1	65.3	15	14
2010	7,024,200	2,308,742	4.2	328,684	75,965	156,886	48.9	18.1	46	20.9	75.9	13	12
2015	7,291,300	2,669,732	5.4	366,153	66,439	166,150	51.2	23.3	53	28.1	78.8	18	15
2020	7,474,200	2,675,708	1.6	357,667	63,232	177,327	51.8	25.5	94	25.7	81.7	11	15

Source: *Hong Kong Annual Digest of Statistics* (1947-2022); *ICAC Mass/Annual Surveys* (1977-2020); *Transparency International*; *Heritage Foundation*; [a] data for 1967; [b] data for 1977

Table 3: Department observations by year

The table reports the number of departments with enough data to estimate average departmental salaries and departmental corruption data included in the sample. Sources of departmental salary and corruption data appear in Appendix A.

Year	Department with:			Year	Department with:		
	Salary data	Corruption data	Both		Salary data	Corruption data	Both
1965	1	0	0	1993	58	78	58
1966	1	0	0	1994	60	79	60
1967	1	0	0	1995	62	79	62
1968	1	1	1	1996	63	80	63
1969	1	1	1	1997	61	80	61
1970	1	1	1	1998	67	79	67
1971	1	1	1	1999	67	80	67
1972	1	1	1	2000	67	81	67
1973	5	1	1	2001	65	81	65
1974	45	56	45	2002	59	81	59
1975	44	56	44	2003	62	79	62
1976	43	56	43	2004	64	75	64
1977	44	55	44	2005	65	73	65
1978	46	55	46	2006	65	74	65
1979	45	55	45	2007	65	74	65
1980	46	55	46	2008	65	73	65
1981	46	60	45	2009	65	72	65
1982	50	60	49	2010	65	72	65
1983	47	61	47	2011	65	72	65
1984	47	61	47	2012	65	72	65
1985	44	63	44	2013	65	72	65
1986	50	66	50	2014	65	72	65
1987	50	65	50	2015	65	72	65
1988	50	65	50	2016	65	72	65
1989	53	69	52	2017	65	72	65
1990	57	73	57	2018	65	72	65
1991	57	73	57	2019	65	72	65
1992	58	74	58				

Table 4. Departmental salaries and corruption

The table reports preliminary findings on the relationship between corruption levels (complaints, prosecutions, convictions) and salary levels. In Panel A, all variables are expressed in natural logs. In Panel B, departmental corruption levels are measured per capita (by dividing by the staffing level in the department), and departmental salaries are measured as deviations from the average salary across all departments with available data that year. In columns 1-3, departmental complaints, prosecutions and convictions represent annual figures for the 3rd year following the salary measure. In columns 4-6, the corruption variables represent the sum of complaints, prosecutions and convictions over the 3 year period following the salary measurement. Salaries are lagged by 3 years. CPD reports represent the sum of such reports received by the department in the past 5 years. All monetary amounts are expressed in constant 2020 Hong Kong dollars. Variables are defined in Appendix A. These specifications exclude the police. Intercepts, year, and department fixed effects are estimated but not reported. *P*-values in parentheses are based on White heteroscedasticity-consistent standard errors two-way clustered by department and year. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Annual and sum of last 3 years Complaints/Prosecutions/Convictions

	Log (Complaints)$_t$ (1)	*Log (Prosecutions)$_t$* (2)	*Log (Convictions)$_t$* (3)	*Log (Complaints)$_{[t-3,t]}$* (4)	*Log (Prosecutions)$_{[t-3,t]}$* (5)	*Log (Convictions)$_{[t-3,t]}$* (6)
Log (Salary)$_{t-3}$	-0.249 (0.274)	-0.062 (0.039)**	-0.072 (0.031)**	-0.345 (0.236)	-0.250 (0.109)	-0.225 (0.023)**
Log (CPD Reports) [$_{t-5,t}$]	0.180 (0.000)***	0.026 (0.040)**	0.001 (0.862)	0.248 (0.001)***	0.114 (0.001)***	0.026 (0.224)
Log (Staffing)$_{t-3}$	0.103 (0.224)	0.017 (0.333)	0.000 (0.991)	0.093 (0.464)	0.019 (0.707)	-0.011 (0.788)
Intercept	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Department Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1,391	2,352	2,352	1,297	2,351	2,351
Adj. R^2	0.84	0.41	0.31	0.87	0.61	0.57

Panel B. Annual and sum of last 3 years Complaints/Prosecutions/Convictions per staff employees

	[Compl/Staff]$_t$ (1)	*[Prosec/Staff]$_t$* (2)	*[Conv/Staff]$_t$* (3)	*[Compl/Staff] $_{[t-3,t]}$* (4)	*[Prosec/Staff] $_{[t-3,t]}$* (5)	*[Conv/Staff] $_{[t-3,t]}$* (6)
[Salary/Avg Salary All Depts]$_{t-3}$	-0.0038 (0.009)***	-0.0003 (0.021)**	-0.0002 (0.044)**	-0.0125 (0.154)	-0.0008 (0.035)**	-0.0004 (0.045)**
Log (CPD Reports) [$_{t-5,t}$]	0.0002 (0.724)	0.0001 (0.110)	0.000 (0.121)	0.0021 (0.154)	0.0002 (0.036)**	0.0001 (0.107)
Log (Staffing)$_{t-3}$	-0.0025 (0.053)*	-0.0001 (0.315)	-0.0001 (0.264)	-0.010 (0.027)**	-0.0003 (0.258)	-0.0002 (0.201)
Intercept	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Department Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1,388	2,351	2,351	1,281	2,349	2,350
Adj. R^2	0.04	0.02	0.01	0.28	0.12	0.11

Table 5. Lagged effect of departmental salary on corruption

The table reports the coefficients of the salary variable from estimating the specifications of Table 4, Panel A, columns 1-3 and Table 4, Panel B, columns 1-3 for different salary lags for complaints, prosecutions and convictions (ranging from contemporaneous measures to 5-year lags). Variables are defined in Appendix A. These specifications exclude the police. Control variables, intercepts, year, and department fixed effects are estimated but not reported. *P*-values in parentheses are based on White heteroscedasticity-consistent standard errors two-way clustered by department and year. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	Complaints $_t$ (1)	*Prosecutions* $_t$ (2)	*Convictions* $_t$ (3)
A. Log of Complaints/Prosecutions/Convictions Total number			
Log (Salary)$_t$	-0.036 (0.860)	-0.049 (0.431)	-0.048 (0.208)
Log (Salary)$_{t-1}$	-0.267 (0.171)	-0.113 (0.156)	**-0.093 (0.063)***
Log (Salary)$_{t-2}$	-0.162 (0.437)	-0.205 (0.187)	**-0.100 (0.027)****
Log (Salary)$_{t-3}$	-0.249 (0.274)	**-0.062 (0.039)****	**-0.072 (0.031)****
Log (Salary)$_{t-4}$	-0.071 (0.728)	-0.121 (0.179)	-0.067 (0.158)
Log (Salary)$_{t-5}$	0.0320 (0.874)	-0.030 (0.605)	-0.035 (0.325)
B. *Complaints/Prosecutions/Convictions Per staff employee*			
[Salary/Avg Salary All Depts]$_t$	-0.000 (0.925)	-0.0002 (0.168)	-0.0001 (0.253)
[Salary/ Avg Salary All Depts]$_{t-1}$	-0.002 (0.403)	**-0.0002 (0.049)****	**-0.0001 (0.085)***
[Salary/ Avg Salary All Depts]$_{t-2}$	-0.003 (0.279)	**-0.0003 (0.062)***	**-0.0001 (0.054)***
[Salary/ Avg Salary All Depts]$_{t-3}$	**-0.004 (0.009)*****	**-0.0003 (0.021)****	**-0.0002 (0.044)****
[Salary/ Avg Salary All Depts]$_{t-4}$	-0.002 (0.274)	**-0.0003 (0.098)***	**-0.0002 (0.078)***
[Salary/ Avg Salary All Depts]$_{t-5}$	-0.000 (0.966)	-0.000 (0.290)	-0.0001 (0.256)

Table 6. Analysis of 1st differences

This table presents coefficients from regressions of percentage changes in departmental corruption complaints, prosecutions and convictions (Panel A), and integer changes of these corruption measures (Panel B) on percentage changes in departmental salaries. Salary variables measure percentage changes in salaries from years *t*-4 to *t*-3 and for *t*-3 to *t*-2. Changes in corruption are measured from *t*-1 to *t*. Variables are defined in Appendix A. These specifications exclude the police. Intercepts, year, and department fixed effects are estimated but not reported. *P*-values in parentheses are based on White heteroscedasticity-consistent standard errors two-way clustered by department and year. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Annual Changes in Complaints/Prosecutions/Convictions (%) and Salaries (%)

	Δ (Complaints)$_{[t-1,t]}$(%)	Δ (Prosecutions) $_{[t-1,t]}$(%)	Δ (Convictions) $_{[t-1,t]}$(%)
	(1)	(2)	(3)
Δ (Salary) $_{[t-4,t-3]}$(%)	-0.4256 (0.027)**	-0.2282 (0.119)	-0.1128 (0.068)*
Δ (Salary) $_{[t-3,t-2]}$(%)	0.6792 (0.477)	-0.0247 (0.848)	-0.1205 (0.084)*
Log (Salary)$_{t-4}$	0.0219 (0.943)	-0.4504 (0.105)	-0.2365 (0.051)*
Log (CPD Reports) $_{[t-5,t]}$	0.134 (0.194)	-0.0864 (0.177)	-0.0123 (0.541)
Log (Staffing)$_{t-3}$	0.2188 (0.438)	-0.1194 (0.118)	-0.012 (0.730)
Log (Complaints)$_{t-1}$	-0.4917 (0.000)***	0.1438 (0.002)***	
Log (Prosecutions)$_{t-1}$		-1.0232 (0.000)***	0.0167 (0.839)
Log (Convictions)$_{t-1}$			-1.2563 (0.000)***
Intercept	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Department Fixed Effects	Yes	Yes	Yes
Obs	1,166	1,341	2,219
Adj. R^2	0.04	0.07	0.24

Panel B. Annual Changes in Complaints/Prosecutions/Convictions (numbers) and Salaries (%)

	Δ Complaints$_{[t-1,t]}$ (1)	*Δ Prosecutions* $_{[t-1,t]}$ (2)	*Δ Convictions* $_{[t-1,t]}$ (3)
Δ (Salary) $_{[t-4,t-3]}$*(%)*	-1.036 (0.332)	-0.3751 (0.084)*	-0.1227 (0.051)*
Δ (Salary) $_{[t-3,t-2]}$*(%)*	-0.2191 (0.904)	-0.2033 (0.228)	-0.1365 (0.076)*
Log (Salary)$_{t-4}$	0.065 (0.977)	-0.5458 (0.200)	-0.2849 (0.085)*
Log (CPD Reports) $_{[t-5,t]}$	0.5282 (0.196)	-0.0367 (0.689)	0.0082 (0.809)
Log (Staffing)$_{t-3}$	0.5402 (0.71)	-0.0561 (1.000)	0.0072 (0.882)
Complaints $_{t-1}$	-0.5019 (0.000)***	0.0264 (0.004)***	
Prosecutions $_{t-1}$		-1.0907 (0.000)***	-0.0522 (0.314)
Convictions $_{t-1}$			-0.8964 (0.000)***
Intercept	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Department Fixed Effects	Yes	Yes	Yes
Obs	1,166	1,341	2,219
Adj. R^2	0.25	0.52	0.47

Table 7. Heckman 2-stage procedure for corruption convictions on 1st differences

This table presents coefficients from regressions using the Heckman two-stage model of percentage changes in departmental corruption complaints, prosecutions and convictions. Panel A reports the results of the 1st stage, where we model the likelihood of complaints and prosecutions. Panel B reports coefficients from regressions of percentage changes in departmental salaries on percentage changes in prosecutions and convictions respectively. Salary variables measure percentage changes in salaries from years *t*-4 to *t*-3 and for *t*-3 to *t*-2. Changes in corruption are measured from *t*-1 to *t*. Variables are defined in Appendix A. Intercepts, year, and department fixed effects are estimated but not reported. Estimates are computed using maximum likelihood. *P*-values in parentheses are based on Huber-White standard errors. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Stage 1 (Selection equation): Modeling the likelihood of complaints and prosecutions

Dependent Variable: (=1 if cases >0)	Complaints $_t$ (1)	Prosecutions $_t$ (2)	Prosecutions $_t$ (3)	Prosecutions $_t$ (4)
Log (Salary)$_{t-3}$	0.319 (0.305)	-0.1959 (0.534)	1.9205 (0.018)**	1.7899 (0.013)**
[Salary/Avg Salary All Depts]$_{t-3}$	-0.7669 (0.008)***	-0.5747 (0.059)*	-2.3817 (0.009)***	-1.8567 (0.028)**
Log (CPD Reports) [$_{t-5,t}$]	0.3225 (0.000)***	0.4087 (0.000)***	0.1337 (0.090)*	0.0301 (0.774)
Log (Staffing)$_{t-3}$			0.4199 (0.000)***	0.6855 (0.000)***
Complaints $_t$ dummy variable		0.5988 (0.004)***	0.7244 (0.004)***	0.7891 (0.003)***
Complaints $_{t-1}$ dummy variable	1.0161 (0.000)***	0.1928 (0.181)	0.3563 (0.169)	0.5136 (0.067)*
Complaints $_{t-2}$ dummy variable	0.6762 (0.000)***	0.2351 (0.144)	-0.1994 (0.433)	-0.104 (0.675)
Log (Criminality)$_{t-3}$	3.7025 (0.000)***	0.6231 (0.541)		
Post-Secondary Education (%)$_{t-3}$	12.003 (0.000)***	0.0481 (0.992)		
GDP Growth Rate$_{t-3}$	0.4572 (0.706)	-2.9948 (0.030)**		
Trade with Mainland (%)$_{t-3}$	-2.3892 (0.381)	-5.6247 (0.022)**		
Log (GDP per capita)$_{t-3}$	-1.7314 (0.018)**	1.9098 (0.019)**		
Corruption Perceptions (%)$_{t-3}$	0.8149 (0.229)	0.7874 (0.323)		
Willing to Report Corruption(%)$_{t-3}$	1.0333 (0.187)	0.202 (0.843)		
Intercept	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes
Department Fixed Effects	No	No	No	Yes

Panel B. Stage 2 (Response equation): Explaining the number of prosecutions and convictions

Dependent variable:	Δ (Prosecutions)$_{[t-1,t]}$ (%)	Δ (Convictions)$_{[t-1,t]}$ (%)	Δ (Convictions)$_{[t-1,t]}$ (%)	Δ (Convictions)$_{[t-1,t]}$ (%)
	(1)	(2)	(3)	(4)
Δ (Salary) $_{[t-4,t-3]}$(%)	-0.2434 (0.518)	-1.5361 (0.079)*	-1.957 (0.010)***	-1.9498 (0.011)**
Δ (Salary) $_{[t-3,t-2]}$(%)	-0.4955 (0.023)**	-2.6589 (0.013)**	0.4632 (0.759)	0.4364 (0.774)
Log (Salary)$_{t-4}$	-0.2984 (0.128)	-1.3693 (0.006)***	-1.1441 (0.003)***	-1.1283 (0.003)***
Log (CPD Reports) $_{[t-5,t]}$	0.091 (0.337)	0.2055 (0.162)	-0.3726 (0.003)***	-0.3609 (0.004)***
Log (Staffing)$_{t-3}$	0.1183 (0.037)**	-0.0416 (0.742)	-0.0723 (0.629)	-0.0675 (0.677)
Log (Complaints)$_{t-1}$	0.3369 (0.000)***	0.3467 (0.000)***	0.3675 (0.001)***	0.3672 (0.001)***
Log (Prosecutions)$_{t-1}$	-0.6788 (0.000)***	-0.0307 (0.832)	-0.1936 (0.296)	-0.1944 (0.294)
Log (Convictions)$_{t-1}$		-0.7856 (0.001)***	-0.7707 (0.001)***	-0.7703 (0.001)***
Log (Criminality)$_{t-3}$	2.2886 (0.018)**	3.978 (0.059)*		
Post-Secondary Education (%)$_{t-3}$	1.796 (0.601)	3.9666 (0.637)		
GDP Growth Rate$_{t-3}$	0.6214 (0.536)	-3.3104 (0.178)		
Trade with Mainland (%)$_{t-3}$	-0.6791 (0.788)	-2.9733 (0.520)		
Log (GDP per capita)$_{t-3}$	-0.373 (0.647)	1.1418 (0.417)		
Corruption Perceptions (%)$_{t-3}$	1.0357 (0.028)**	2.4061 (0.104)		
Willing to Report Corruption(%)$_{t-3}$	1.4074 (0.072)*	1.1568 (0.510)		
Intercept	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes
Department Fixed Effects	No	Yes	Yes	Yes
Obs	1,101	1,130	1,169	1,169

Table 8. Heckman 2-stage procedure for $ bribe amounts

This table presents coefficients from regressions using the Heckman two-stage model of levels and percentage changes in departmental dollar bribe amounts received or solicited. Panel A reports the results of the 1st stage, where we model the likelihood of an on-going corruption case in the department reflected in press releases. *Active Case* is a dummy variable indicating that there is at least one on-going corruption case in the department in year *t* that has been reported in ICAC press releases. Panel B reports coefficients from regressions of dollar bribe amounts per departmental staff (column 1), dollar bribe amounts per perpetrator involved in the case (column 2), and percentage changes in aggregate dollar bribe amounts received by all departmental staff (columns 3-4) on departmental salary levels, deviations from average civil service salary, and percentage changes in departmental salaries. Salary change variables measure percentage changes in salaries from year *t*-1 to *t*. Changes in dollar bribe amounts are measured from *t*-1 to *t*. Variables are defined in Appendix A. All amounts have been converted to constant 2020 HKD. Dollar bribe change percentages have been winsorized at the top and bottom 1%. Intercepts, year, and department fixed effects are estimated but not reported. Estimates are computed using maximum likelihood. *P*-values in parentheses are based on Huber-White standard errors. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Stage 1 (Selection equation): Modeling the likelihood of an active corruption case reported in the press

Dependent Variable: (=1 if active cases reported in press releases implicating the department that year >0)	*Active Case $_t$ dummy variable* (1)	*Active Case $_t$ dummy variable* (2)	*Active Case $_t$ dummy variable* (3)	*Active Case $_t$ dummy variable* (3)
Log (Salary)$_t$	-0.3009 (0.625)	-0.2959 (0.633)	2.6019 (0.016)**	-0.4658 (0.446)
[Salary/Avg Salary All Depts]$_t$	-0.558 (0.448)	-0.5675 (0.443)	-3.5701 (0.003)***	-0.4424 (0.473)
Log (CPD Reports) [$_{t-5,t}$]	-0.0019 (0.982)	-0.0018 (0.983)	0.1302 (0.075)*	0.0594 (0.438)
Log (Staffing)$_t$	0.1934 (0.023)**	0.192 (0.024)**	0.0405 (0.564)	0.1761 (0.030)**
Active Case $_{t-1}$ dummy variable	1.6267 (0.000)***	1.6232 (0.000)***	1.5944 (0.000)***	1.5437 (0.000)***
Active Case $_{t-2}$ dummy variable	-0.1912 (0.211)	-0.1895 (0.218)	-0.2205 (0.093)*	-0.1895 (0.104)
Active Case $_{t-3}$ dummy variable	0.2199 (0.111)	0.2247 (0.102)	0.2746 (0.004)***	0.1800 (0.076)*
Press Releases $_t$	0.0861 (0.376)	0.0875 (0.371)	0.1799 (0.010)**	0.1915 (0.010)**
Press Releases (Total)	0.6023 (0.000)***	0.6057 (0.000)***	0.3618 (0.000)***	0.5079 (0.00)***
Log (Criminality)$_t$				-0.6100 (0.350)
Post-Secondary Education (%)$_t$				-13.964 (0.000)***
GDP Growth Rate$_{t-3}$				-1.6686 (0.184)
Trade with Mainland (%)$_t$				7.8010 (0.049)**
Log (GDP per capita)$_t$				-1.0120 (0.272)
Corruption Perceptions (%)$_t$				-0.7477 (0.179)
Willing to Report Corruption(%)$_t$				1.5563 (0.025)**
Intercept	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	No
Department Fixed Effects	Yes	Yes	Yes	Yes

Panel B. Stage 2 (Response equation): Explaining the $ amount of bribes

Dependent variable:	*Log ($Bribes/Staffing)$_t$*	*Log ($Bribes/Acceptor)$_t$*	*Δ ($Bribes) [$_{t-1,t}$](%)*	*Δ ($Bribes) [$_{t-1,t}$](%)*
	(1)	(2)	(3)	(4)
Log (Salary)$_t$	0.6735 (0.172)	0.5041 (0.693)		
[Salary/Avg Salary All Depts]$_t$	-2.2305 (0.022)**	-4.976 (0.044)**		
Δ (Salary) [$_{t-1,t}$](%)			-0.4931 (0.024)**	-0.3408 (0.038)**
Log (Salary)$_{t-1}$			-0.5734 (0.173)	-0.2467 (0.432)
Log (CPD Reports)[$_{t-5,t}$]	0.2097 (0.270)	0.8024 (0.105)	0.0365 (0.615)	0.0655 (0.344)
Log (Staffing)$_{t-1}$	0.5266 (0.004)***	1.8156 (0.000)***	0.0437 (0.533)	0.0305 (0.680)
Log (Criminality)$_t$				-1.049 (0.038)**
Post-Secondary Education (%)$_t$				-6.0025 (0.004)***
GDP Growth Rate$_{t-3}$				0.6254 (0.526)
Trade with Mainland (%)$_t$				4.0649 (0.205)
Log (GDP per capita)$_t$				-0.4344 (0.588)
Corruption Perceptions (%)$_t$				0.0136 (0.976)
Willing to Report Corruption(%)$_t$				0.4921 (0.335)
Intercept	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	No
Department Fixed Effects	Yes	Yes	Yes	Yes
Obs	2,291	2,306	2,284	2,284

Table 9. Analyzing $ bribe amounts for individual bribe cases

This table presents coefficients from regressions of $ bribe amounts on salaries for individual bribe incidents (as opposed to annual totals). Columns 1-4 include only bribes that were actually solicited or accepted. The sample in Column 5 also includes bribes that were offered but were not accepted by the government official. All other variables are defined in Appendix A. Intercepts, year, and department fixed effects are estimated but not reported. *P*-values in parentheses are based on heteroscedasticity-consistent standard errors clustered by year. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	*Log ($Bribe)$_t$*	*Log ($Bribe)$_t$*	*Log ($Bribes/Acceptor)$_t$*	*Log ($Bribes/Acceptor)$_t$*	*Log ($Bribes/Acceptor)$_t$*
	(1)	(2)	(3)	(4)	(5)
Log (Salary)$_t$	-1.7735 (0.007)***		-1.9954 (0.003)***		
[Salary/Avg Salary All Depts]$_t$		-2.6128 (0.059)*		-2.8821 (0.038)**	-2.7531 (0.044)**
Log (CPD Reports)[$_{t-5,t}$]	-0.2485 (0.409)	-0.2994 (0.255)	-0.2377 (0.435)	-0.2982 (0.260)	-0.1274 (0.666)
Log (Staffing)$_t$	0.226 (0.590)	0.1854 (0.597)	0.1985 (0.633)	0.1569 (0.648)	0.0295 (0.942)
Number of Acceptors	0.2843 (0.000)***	0.2849 (0.000)***			
Intercept	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Department Fixed Effects	Yes	Yes	Yes	Yes	Yes
Obs	554	554	554	554	564
Adj. R^2	0.34	0.34	0.32	0.32	0.29

Table 10. Estimating co-integration equations

This table presents coefficients from co-integrating regressions of corruption complaints, prosecutions, convictions, and $ bribe amounts on salaries for individual bribe incidents (as opposed to annual totals). All other variables are defined in Appendix A. Intercepts, year, and department fixed effects are estimated but not reported. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Panel Fully Modified Least Squares (FMOLS) estimation

Dependent variable:	*Log (Complaints)$_t$*	*Log (Prosecutions)$_t$*	*Log (Convictions)$_t$*	*Log ($Bribes)$_t$*
	(1)	(2)	(3)	(4)
Log (Salary)$_{t-3}$	0.0178 (0.786)	-0.1265 (0.000)***	-0.088 (0.000)***	-0.6663 (0.026)**
Log (CPD Reports)$_{[t-5,t]}$	0.0741 (0.349)	-0.0165 (0.590)	-0.0323 (0.169)	1.2002 (0.002)***
Log (Staffing)$_{t-3}$	0.3106 (0.000)***	0.018 (0.310)	-0.0221 (0.103)	0.1669 (0.443)
Year Fixed Effects	No	No	No	No
Department Fixed Effects	No	No	No	No
Obs	1,157	1,957	1,957	1,845
Adj. R^2	0.85	0.63	0.32	0.37

Panel B. Panel Dynamic Least Squares (DOLS) estimation

Dependent variable:	*Log (Complaints)$_t$*	*Log (Prosecutions)$_t$*	*Log (Convictions)$_t$*	*Log ($Bribes)$_t$*
	(1)	(2)	(3)	(4)
Log (Salary)$_{t-3}$	0.1695 (0.132)	-0.0663 (0.030)**	-0.0429 (0.041)**	-0.7795 (0.039)**
Log (CPD Reports)$_{[t-5,t]}$	0.0197 (0.887)	0.0223 (0.546)	-0.0179 (0.480)	1.3432 (0.003)***
Log (Staffing)$_{t-3}$	0.3912 (0.000)***	0.0972 (0.000)***	0.0291 (0.029)**	-0.4255 (0.075)*
Year Fixed Effects	No	No	No	No
Department Fixed Effects	No	No	No	No
Obs	899	1,748	1,748	1,685
Adj. R^2	0.85	0.72	0.68	0.48

Table 11. Corruption in the Police

This table presents coefficients from ordinary least squares regressions of levels and percentage changes in corruption complaints, prosecutions and convictions on lagged levels and percentage changes in salaries, where the corrupt individual is a member of the police. The sample for complaints is 1974-2019 and for prosecutions and convictions 1968-2019. The specifications in columns 3-6 include a dummy variable for the period of the ICAC (post-1974). All other variables are defined in Appendix A. Intercepts are estimated but not reported. *P*-values in parentheses are based on White heteroscedasticity-consistent standard errors. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	Log (Complaints)$_t$	*Δ (Complaints)[t-1,t](%)*	*Log (Prosecutions)$_t$*	*Δ (Prosecutions) [t-1,t](%)*	*Log (Convictions)$_t$*	*Δ (Convictions) [t-1,t](%)*
	(1)	(2)	(3)	(4)	(5)	(6)
Log (Salary)$_{t-3}$	-0.6700 (0.000)***		-1.2639 (0.001)***		-0.8964 (0.022)**	
Δ (Salary) [t-4,t-3](%)		0.3523 (0.461)		0.0429 (0.975)		0.3816 (0.854)
Δ (Salary) [t-3,t-2](%)		-0.3052 (0.638)		-3.4701 (0.002)***		-4.5097 (0.030)**
Log (Salary)$_{t-4}$		-0.1983 (0.071)*		-0.9527 (0.017)**		-1.682 (0.035)**
Log (Staffing)$_{t-3}$	-0.4974 (0.053)*	-0.0837 (0.624)	-1.3057 (0.012)**	-0.6971 (0.180)	-1.6365 (0.005)***	0.1248 (0.894)
ICAC period			0.9524 (0.113)	0.9489 (0.172)	0.8436 (0.162)	1.4993 (0.212)
Log (Complaints)$_{t-1}$		-0.2723 (0.014)**				
Log (Prosecutions)$_{t-1}$				-0.6432 (0.000)***		
Log (Convictions)$_{t-1}$						-0.8821 (0.000)***
Log (HK Criminality) $_t$	0.6823 (0.088)*	0.3406 (0.153)	1.5847 (0.032)**	0.1258 (0.889)	1.3855 (0.130)	-0.7568 (0.618)
Intercept	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	No	No	No
Department Fixed Effects	No	No	No	No	No	No
Obs	46	45	52	51	52	51
Adj. R^2	0.71	0.11	0.65	0.29	0.57	0.22

Table 12. Logit of the likelihood that a department has at least 1 corruption case 1974-2019

This table reports coefficients from logit models of the likelihood that the department has experienced at least one corruption case in the entire 1974-2019 period. In these logits, all 46 department-year observations are equal to 1 if there's at least one non-zero year for the department in question in the entire 46 year sample period. Panel A analyses corruption complaints, Panel B prosecutions, and Panel C convictions. All variables are defined in Appendix A. Intercepts and year fixed effects are estimated but not reported. *P*-values in parentheses are based on finite sample adjusted cluster-robust standard errors and covariances. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Likelihood the department has at least one complaint during 1974-2019

	Complaints (1)	*Complaints* (2)	*Complaints* (3)	*Complaints* (4)
Log (Salary)$_{t-3}$	-1.2783 (0.005)***	-1.3377 (0.002)***		
[Salary/Avg Salary All Depts]$_{t-3}$			-1.2884 (0.001)***	-1.2931 (0.001)***
Log (CPD Reports)$[_{t-5,t}]$	2.5086 (0.000)***	2.5002 (0.000)***	2.5355 (0.000)***	2.5219 (0.000)***
Log (Staffing)$_{t-3}$	0.6871 (0.000)***	0.6803 (0.000)***	0.6934 (0.000)***	0.6858 (0.000)***
Log (HK Criminality) $_t$		0.4106 (0.447)		0.2687 (0.640)
HK Post-Secondary Education (%) $_t$		3.7265 (0.100)*		2.6538 (0.273)
HK GDP Growth Rate $_t$		1.2096 (0.427)		0.568 (0.699)
HK Trade with Mainland/Trade Total (%) $_t$		-2.6071 (0.502)		-7.6398 (0.059)*
Log (HK GDP per capita) $_t$		1.3741 (0.166)		1.4323 (0.230)
HK Corruption Perceptions (%) $_t$		-1.1036 (0.019)**		-1.7689 (0.000)***
HK Willingness to Report Corruption (%) $_t$		-2.3139 (0.001)***		-2.6557 (0.000)***
Intercept	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No
Department Fixed Effects	No	No	No	No
Obs	2,405	2,398	2,403	2,398
MsFadden R^2	0.35	0.35	0.36	0.35

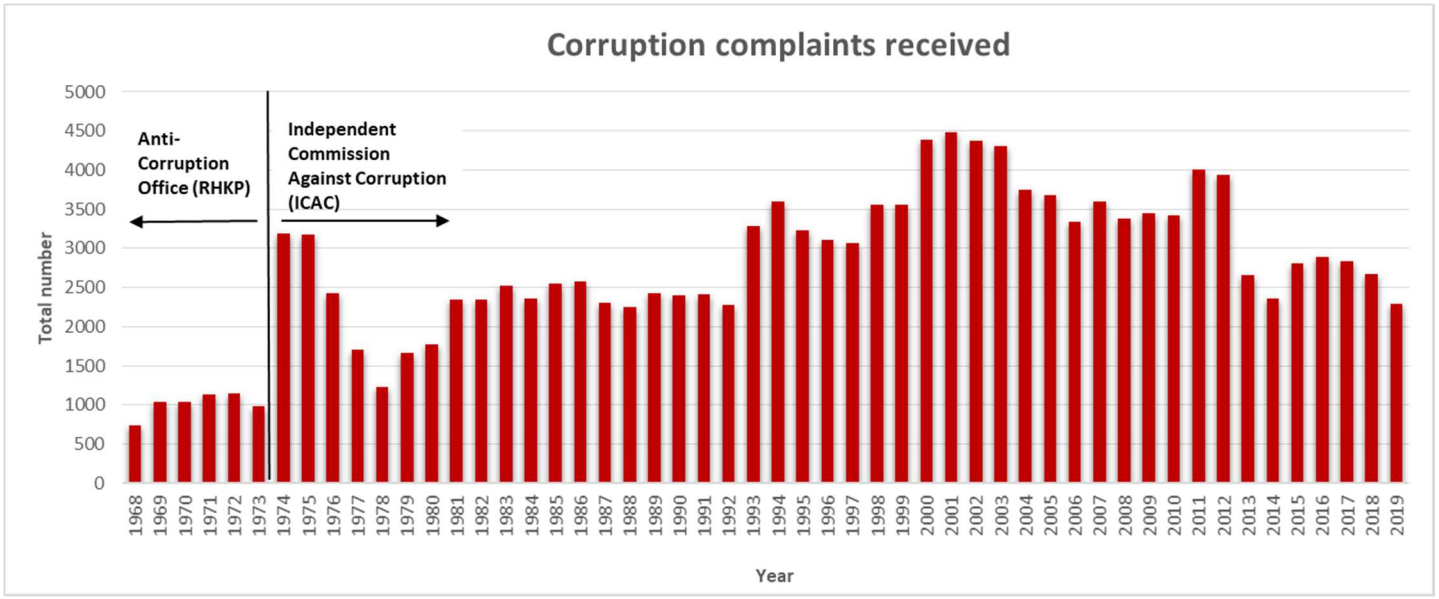
Panel B. Likelihood the department has at least one prosecution during 1974-2019

	Prosecutions (1)	*Prosecutions* (2)	*Prosecutions* (3)	*Prosecutions* (4)
Log (Salary)$_{t-3}$	--1.5483 (0.000)***	-1.543 (0.000)***		
[Salary/Avg Salary All Depts]$_{t-3}$			-1.3462 (0.000)***	-1.3307 (0.000)***
Log (CPD Reports)$[_{t-5,t}]$	1.0259 (0.000)***	1.0146 (0.000)***	1.0259 (0.000)***	1.0095 (0.000)***
Log (Staffing)$_{t-3}$	1.0257 (0.000)***	1.0227 (0.000)***	1.0252 (0.000)***	1.0211 (0.000)***
Log (HK Criminality) $_t$		0.3681 (0.296)		-0.0108 (0.976)
HK Post-Secondary Education (%) $_t$		2.9309 (0.030)**		1.1752 (0.339)
HK GDP Growth Rate $_t$		-0.116 (0.890)		-0.6537 (0.466)
HK Trade with Mainland/Trade Total (%) $_t$		-2.3382 (0.200)		-7.4413 (0.002)***
Log (HK GDP per capita) $_t$		1.0465 (0.023)**		0.9937 (0.100)
HK Corruption Perceptions (%) $_t$		-0.4642 (0.038)**		-1.258 (0.000)***
HK Willingness to Report Corruption (%) $_t$		-0.8407 (0.029)**		-1.2333 (0.000)***
Intercept	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No
Department Fixed Effects	No	No	No	No
Obs	2,405	2,398	2,403	2,398
MsFadden R^2	0.45	0.44	0.44	0.44

Panel C. Likelihood the department has at least one conviction during 1974-2019

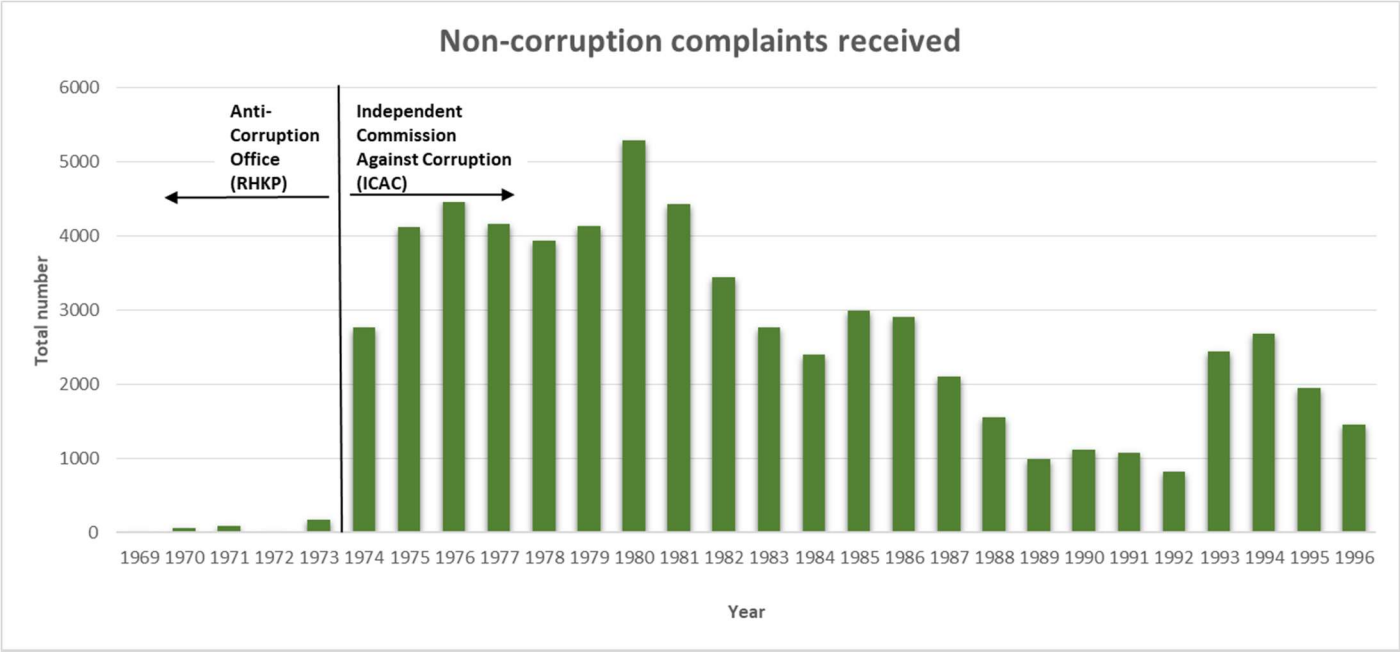
	Convictions (1)	*Convictions* (2)	*Convictions* (3)	*Convictions* (4)
Log (Salary)$_{t-3}$	-2.1304 (0.000)***	-2.114 (0.000)***		
[Salary/Avg Salary All Depts]$_{t-3}$			-1.8762 (0.000)***	-1.8607 (0.000)***
Log (Corruption Prevention Reports)[$_{t-5,t}$]	1.2995 (0.000)***	1.2848 (0.000)***	1.2923 (0.000)***	1.2708 (0.000)***
Log (Staffing)$_{t-3}$	1.1494 (0.000)***	1.1491 (0.000)***	1.1449 (0.000)***	1.1424 (0.000)***
Log (HK Criminality) $_t$		0.1025 (0.782)		-0.4588 (0.161)
HK Post-Secondary Education (%) $_t$		-0.8351 (0.571)		-3.3531 (0.010)**
HK GDP Growth Rate $_t$		0.0455 (0.952)		-0.6533 (0.389)
HK Trade with Mainland/Trade Total (%) $_t$		-1.1322 (0.541)		-7.9781 (0.000)***
Log (HK GDP per capita) $_t$		1.5497 (0.001)***		1.4494 (0.016)**
HK Corruption Perceptions (%) $_t$		-0.3433 (0.151)		-1.4401 (0.000)***
HK Willingness to Report Corruption (%) $_t$		-0.1416 (0.686)		-0.6838 (0.019)**
Intercept	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No
Department Fixed Effects	No	No	No	No
Obs	2,405	2,398	2,403	2,398
MsFadden R^2	0.52	0.52	0.52	0.52

Figure 1: Number of corruption complaints received by the ICAC



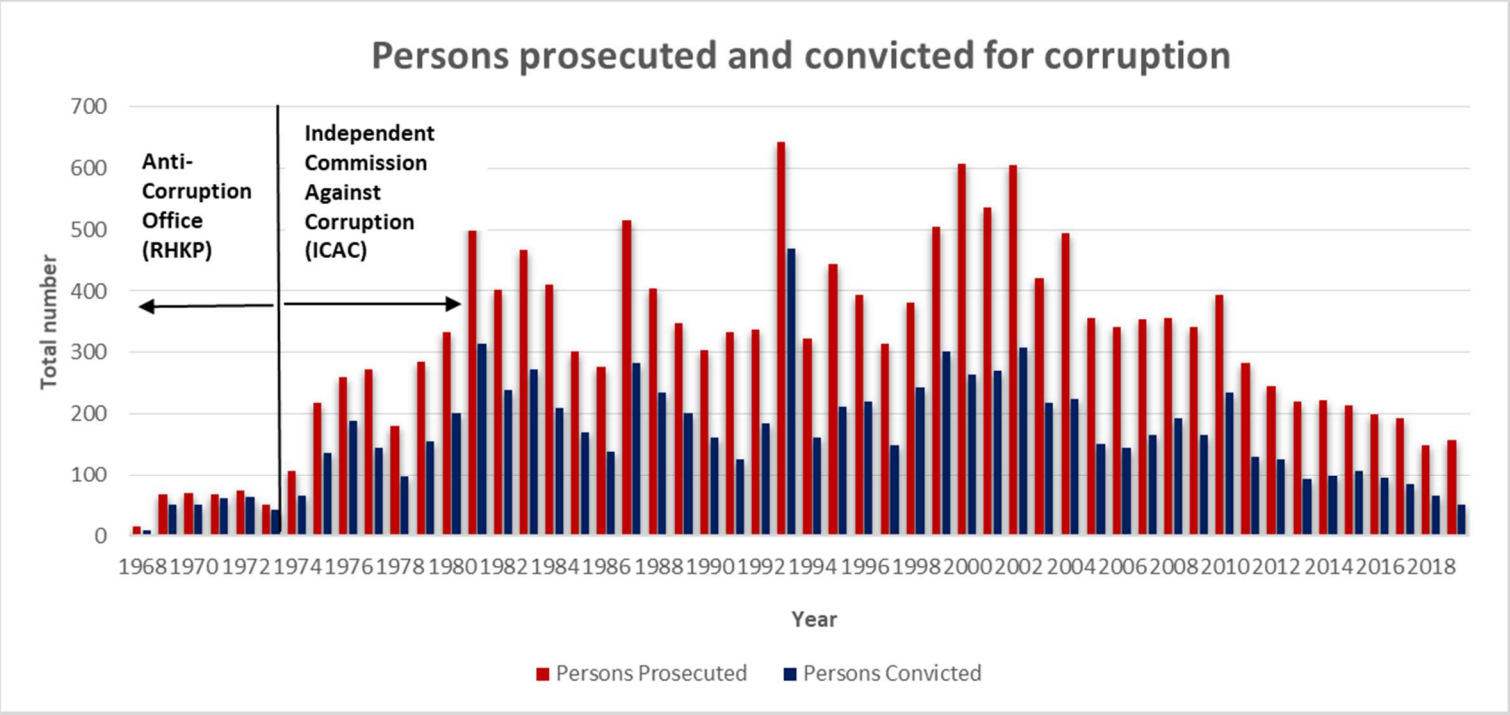
Source: Blair-Kerr (1973b); *ICAC Annual Reports* (1974-2019)

Figure 2: Number of complaints received not reporting corruption



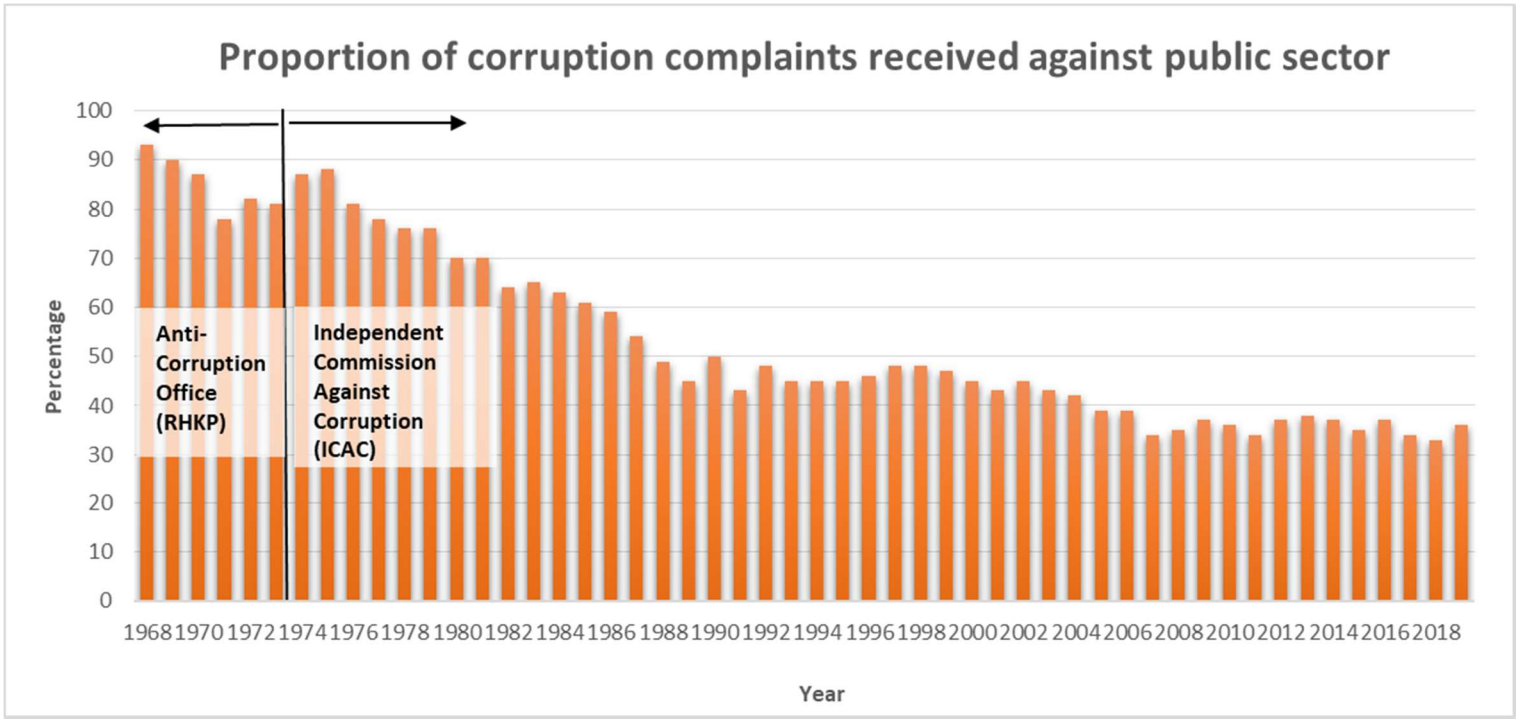
Source: Blair-Kerr (1973b); *ICAC Annual Reports* (1974-2019)

Figure 3: Number of persons prosecuted and convicted for corruption



Source: Blair-Kerr (1973b); *ICAC Annual Reports* (1974-2019)

Figure 4: Proportion of corruption complaints received against public sector



Source: Blair-Kerr (1973b); *ICAC Annual Reports* (1974-2019)

Appendix A: Variable definitions and sources of data

Variable	Definition	Sources of data
Complaints	Number of corruption complaints (reports) received by the ICAC, annually by department. Also expressed as sum of past 3 years, in natural logarithms, in percentage 1st differences, and as a percentage of departmental *staffing* [When estimating natural logarithms, underlying observations with a value of 0 take the value of 0, underlying observations with the value of 1 take the value of ln(0.5+1), and the remaining observations take the value ln(value)].	ICAC Annual Reports (1974-2019); ICAC Replies to Legislative Council Questions (1999-2021); Blair-Kerr (1973b)
Prosecutions	Number of persons prosecuted by the ICAC, annually by department. Also expressed as sum of past 3 years, in natural logarithms, in percentage 1st differences, and as a percentage of departmental *staffing* [When estimating natural logarithms, underlying observations with a value of 0 take the value of 0, underlying observations with the value of 1 take the value of ln(0.5+1), and the remaining observations take the value ln(value)].	ICAC Annual Reports (1974-2019); ICAC Replies to Legislative Council Questions (1999-2021); Blair-Kerr (1973b)
Convictions	Number of persons convicted, following prosecution by the ICAC, annually by department. Also expressed as sum of past 3 years, in natural logarithms, in percentage 1st differences, and as a percentage of departmental *staffing* [When estimating natural logarithms, underlying observations with a value of 0 take the value of 0, underlying observations with the value of 1 take the value of ln(0.5+1), and the remaining observations take the value ln(value)].	ICAC Annual Reports (1974-2019); ICAC Replies to Legislative Council Questions (1999-2021); Blair-Kerr (1973b)
$Bribes	By reading ICAC press releases about corruption cases we identify whether the receivers of bribes work for a government department and what amounts were paid as bribes. We also identify the exact year that the bribe was paid (not the date of the press release). Bribe amounts have been allocated to the exact year that they were paid. We include only bribes that were actually solicited or paid. We exclude bribes that were offered but were refused. We aggregate the dollar bribe amounts by department each year. Bribe amounts paid in foreign currencies have been converted to HK$ using quarterly exchange rates. All figures have been converted to constant 2020 HK$ using the implied GDP deflator. Expressed in natural logarithms, 1st differences, or scaled by departmental staffing and number of acceptors of bribes.	ICAC press releases (1974-2017)
Salary	Average salary by department, calculated by dividing annual departmental expenses on personal emoluments (sum of salaries, allowances, and job related allowances) by the number of staff employed in the department (*Staffing*). All	Hong Kong SAR Budget Estimates (Controlling Officer's Reports); Communications Authority, Companies Registry, ICAC, Hong Kong Monetary Authority, Hong

	figures have been converted to constant 2020 HK$ using the implied GDP deflator. Expressed in natural logarithms, in percentage 1st differences, and as a percentage deviation from the average salary across all departments with data in a given year.	Kong Post, Hospital Authority, Housing Authority, Kowlooon-Canton Railway Company, Land Registry, Legislative Council Commission, Office of The Ombudsman Annual Reports
Staffing	Number of staff employed in the department. It is based on the actual number of staff employed (*strength*). In cases where the actual strength is missing but the number of available positions in the department is available, whether they are filled or not (*establishment*), we estimate staffing by multiplying the establishment figure by the median of the nearest 5 years of available strength-to-establishment ratios for the department. Also expressed in natural logarithms.	Civil Service Bureau; Annual Digest of Statistics (Census and Statistics Bureau, 1967-2021); Hong Kong SAR Budget Estimates (Controlling Officer's Reports; 1967-2022); Communications Authority, Companies Registry, ICAC, Hong Kong Monetary Authority, Hong Kong Post, Hospital Authority, Housing Authority, Kowlooon-Canton Railway Company, Land Registry, Legislative Council Commission, Office of The Ombudsman Annual Reports
CPD Reports	Number of Assignment reports undertaken by ICAC's Corruption Prevention Department, annually by department (sum of past 5 years). Expressed in natural logarithms. [When estimating natural logarithms, underlying observations with a value of 0 take the value of 0, underlying observations with the value of 1 take the value of ln(0.5+1), and the remaining observations take the value ln(value)].	ICAC Annual Reports (1974-2019)
Hong Kong Criminality	Annual number of (non-corruption) criminal cases reported to or handled by the Hong Kong Police. Expressed in natural logarithms.	Annual Digest of Statistics (Census and Statistics Bureau, 1967-2021); Hong Kong SAR Budget Estimates (Controlling Officer's Report: Hong Kong Police Force, 1967-2022)
Post-Secondary Education	Percentage of population aged 15 and over with post-secondary degree.	Annual Digest of Statistics (Census and Statistics Bureau, 1967-2021)
GDP Growth Rate	Annual percentage growth rate of GDP in constant 2020 HK$.	Annual Digest of Statistics (Census and Statistics Bureau, 1967-2021)
Trade with Mainland	Proportion of total trade (exports plus imports) conducted with mainland China.	Annual Digest of Statistics (Census and Statistics Bureau, 1967-2021)
GDP per capita	GDP in constant 2020 HK$ divided by population. Expressed in natural logarithms.	Annual Digest of Statistics (Census and Statistics Bureau, 1967-2021)
Corruption Perceptions	Percentage of respondents who consider corruption "common" and "very common" or "quite common". In years with missing data we extrapolate the	ICAC Mass Survey (1977-1990); ICAC Annual Survey (1992-2020)

	figure to the mid-point of the last available and next available figures. The ICAC conducted its 1st mass survey in 1977. We use the 1977 figures for 1974-1976.	
Willingness to report corruption	Percentage of respondents who provide unequivocal answer that they would report corruption to the ICAC if it came to their attention. In years with missing data we extrapolate the figure to the mid-point of the last available and next available figures. The ICAC conducted its 1st mass survey in 1977. We use the 1977 figures for 1974-1976.	ICAC Mass Survey (1977-1990); ICAC Annual Survey (1992-2020)

Appendix B: Descriptive statistics about the sample

Department	Aggregate Corruption Activity (1974-2019)				Years with salary data available		Average annual salary per staff (1974-2019)	
	Complaints	Prosecutions	Convictions	CPD Assignments per year	From	To	Minimum	Maximum
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hong Kong Police Force (formerly Royal Hong Kong Police Force)	24,143	1,094	416	2.96	1965	2019	114,474	588,796
Housing Authority	3,386	102	48	3.96	1974	2019	99,223	484,400
Correctional Services Department (formerly Prisons Department)	1,213	190	112	1.48	1974	2019	130,814	492,274
Immigration Department	1,076	52	21	2.43	1974	2019	128,579	491,291
Lands & Works Department (formerly Public Works Department)	1,001	97	38	5.64	1974	1984	116,661	215,009
Food & Environmental Hygiene Department	953	56	10	2.81	1999	2019	58,164	367,967
Buildings & Lands Department	772	18	12	2.07	1981	1995	83,497	321,147
Customs & Excise Department	731	69	25	2.53	1977	2019	106,809	488,681
Fire Services Department	704	53	27	0.98	1973	2019	112,037	493,363
Transport Department	618	20	12	2.00	1974	2019	98,489	612,765
Lands Department	501	19	11	1.67	1996	2019	332,271	529,378
Medical & Health Department	456	16	11	3.86	1974	1980	126,421	151,176
Home Affairs Department	450	18	8	1.41	1974	2019	134,020	531,814
New Territories Administration	414	6	1	3.00	1974	1980	112,596	194,446
Education Bureau	383	18	11	1.98	1973	2019	187,334	705,137
Post Office	367	56	30	0.78	1973	2019	108,310	446,656
Judiciary	350	20	3	0.65	1974	2019	166,383	739,839
Water Supplies Department	294	28	12	1.51	1981	2019	151,088	489,319
Leisure & Cultural Services Department	284	23	15	2.85	2000	2019	261,415	378,315
Social Welfare Department	254	10	9	1.13	1973	2019	129,222	551,504
Agriculture, Fisheries & Conservation Department	236	13	2	1.52	1974	2019	104,913	460,889
Electrical & Mechanical Services Department	216	12	2	1.63	1982	1995	28,480	146,702
Labour Department	208	4	4	1.02	1975	2019	124,126	599,428
Marine Department	204	40	17	1.04	1974	2019	96,393	508,624
Highways Department	197	25	10	0.65	1986	2019	200,960	655,284
Independent Commission Against Corruption (ICAC)	193	10	8	0.07	1974	2019	200,153	720,021
Buildings Department	191	5	2	1.71	1996	2019	489,439	706,514
Architectural Services Department	137	13	4	1.74	1986	2019	265,205	700,182
Government Secretariat	137	7	3	1.11	1974	2019	99,227	765,172
Inland Revenue Department	129	7	3	0.48	1974	2019	124,605	490,411
Legal Aid Department	104	2	1	0.50	1974	2019	160,965	572,613
Commerce & Industry Department	103	1	0	0.00	1974	1975	99,938	100,199
Hospital Authority	102	4	3	2.76	1999	2019	516,171	678,287

Office for Film, Newspaper & Article Administration	100	6	1	0.00	1980	2019	213,302	586,258
Department of Health	92	15	6	1.45	1989	2019	241,335	594,987
Trade & Industry Department	81	10	3	0.58	1982	2019	106,192	632,270
Radio Television Hong Kong	79	12	4	0.33	1974	2019	192,787	666,702
Civil Engineering & Development Department	74	3	2	1.74	1986	2019	259,729	731,644
Government Supplies Department	53	3	3	0.50	1974	2001	92,830	378,511
Department of Justice (formerly Legal Department)	46	3	1	0.20	1974	2019	237,917	782,488
Drainage Services Department	45	6	3	1.32	1989	2019	126,083	580,996
Registrar General's Department	45	0	0	1.67	1974	1982	124,291	171,901
Environmental Protection Department	44	4	2	1.51	1981	2019	239,152	687,173
Civil Aviation Department	43	2	2	0.41	1974	2019	210,206	851,711
Territory Development Department	37	3	2	0.24	1981	2001	238,886	709,389
Registration of Persons Office	33	0	0	1.00	1974	1974	90,778	90,778
Rating & Valuation Department	31	2	0	0.33	1974	2019	156,624	546,479
Treasury	24	0	0	0.17	1974	2019	142,297	516,283
Census & Statistics Department	21	2	2	0.13	1974	2019	113,608	489,166
Government Logistics Department	20	2	2	0.47	2003	2019	270,079	404,564
Kowloon-Canton Railway Corporation	20	1	1	0.85	1974	2007	91,122	470,025
Auxiliary Medical Service	18	2	2	0.15	1974	2019	101,572	402,628
Printing Department	15	3	3	0.21	1974	2001	90,448	310,577
Information Services Department	14	0	0	0.09	1974	2019	198,660	759,138
Official Receiver's Office	13	0	0	0.29	1992	2019	283,106	595,814
Civil Aid Service	12	0	0	0.04	1974	2019	111,489	448,993
Land Registry	10	1	0	0.24	2003	2019	454,023	570,579
Planning Department	10	0	0	0.37	1990	2019	350,547	716,446
Government Property Agency	9	2	2	0.43	1990	2019	314,481	721,188
Hong Kong Monetary Authority	8	1	0	0.50	2004	2019	986,213	1,465,561
Civil Service Training & Development Institute	5	1	0	0.00	1983	2001	291,548	570,277
Companies Registry	5	0	0	0.04	1994	2019	308,156	635,782
Hong Kong Observatory	5	1	0	0.04	1974	2019	186,308	685,139
Government Laboratory	3	0	0	0.17	1978	2019	212,949	730,857
Government Land Transport Agency	3	2	1	0.18	1980	2001	123,039	342,290
Invest Hong Kong	3	0	0	0.05	2000	2019	415,914	852,893
Office of the Communications Authority	3	0	0	0.77	1998	2019	677,910	870,146
Audit Department	2	0	0	0.00	1974	2019	203,505	865,804
Industry Department	2	0	0	0.17	1982	1999	194,003	553,428
Intellectual Property Department	2	0	0	0.20	1990	2019	261,375	813,369
Chief Executive's Office	1	1	0	0.00	1974	2019	159,218	702,892
Public Service Commission Secretariat	1	0	0	0.00	1974	2019	145,074	696,575
University Grants Committee	1	0	0	0.04	1974	2019	137,239	924,188
Royal Hong Kong Regiment (The Volunteers)	0	0	0	0.00	1974	1980	226,439	335,317
Government Flying Service	0	0	0	0.00	1974	2019	169,390	710,076
Independent Police Complaints Council	0	0	0	0.05	1985	2006	73,899	720,014
Information Technology Services Department	0	0	0	0.40	1998	2002	481,061	634,950

Joint Secr, Adv Bodies on Civil Service & Judicial Salaries & Cond of Service	0	0	0	0.00	1981	2019	283,632	1,058,876
Legislative Council Commission	0	0	0	0.05	1998	2019	605,862	904,549
London Office	0	0	0	0.00	1974	1980	263,094	476,148
Management Services Agency	0	0	0	0.00	1993	2000	314,534	719,782
Office of The Ombudsman	0	0	0	0.00	1978	2019	277,404	823,729
Office of Unofficial Members of Executive & Legislative Councils	0	0	0	0.00	1974	1978	190,989	321,969
Official Languages Agency	0	0	0	0.00	1996	2001	495,596	657,145
Registration & Electoral Office	0	0	0	0.00	1994	2019	126,674	737,122
Registry of Trade Unions	0	0	0	0.00	1974	1982	186,524	251,547
Secretariat, Commissioner on Interception of Comms & Surveillance	0	0	0	0.00	2006	2019	298,464	685,362
Standing Commission on Civil Service Salaries & Conditions of Service	0	0	0	0.00	1979	1999	218,072	846,470
Standing Commission on Disciplined Services Salaries & Cond of Service	0	0	0	0.00	1998	1999	565,963	568,833
Working Family & Student Financial Assistance Agency	0	0	0	0.17	1990	2019	207,377	478,032
Total	**41,540**	**2,196**	**933**					