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Long-term evolution of business ethics in Hong Kong

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Abstract: This paper applies the distribution dynamics analysis (DDA) technique in business ethics research using proprietary data measuring the general public's perception of business ethics levels in 206 major companies operating in Hong Kong. The data is comprehensive and longitudinal, consisting of 10,773 interviews collected between 2012 and 2016, transformed into a summary score of the perceived business ethics standards of Hong Kong companies, i.e., the relative Confucian business ethics score (RCBES). The study documents a slow long-run convergence process in business ethics levels across the companies operating in Hong Kong towards the RCBES value of 1.02, i.e., slightly above the average RCBES equal to 1. The results also indicate the emergence and migration of two convergence clubs with a smaller and larger group of companies clustering to the RCBES values below (0.87) and slightly above (1.02) the average value. The paper offers several implications and avenues for future research directions.

Keywords: business ethics; Confucian business ethics score; CBES; distribution dynamics analysis; DDA; convergence club; mobility probability plot; MPP; Junzi virtues; Hong Kong.

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1 Introduction

Ethics is defined as the code of moral principles that set standards of good or bad and right or wrong behaviour (Schermerhorn, 2022). In recent decades, business ethics has received considerable attention from academics and practitioners alike (e.g., Robertson, 2008; Alzola et al., 2020). Such attention coincides with recurring corporate scandals around the world which have continued to keep the ethicality of businesses in the spotlight (e.g., Elbæk and Mitkidis, 2021). The importance of business ethics and the harms of unethical practices are illustrated by the costs of the recent scandals of Samsung and Volkswagen.[1] On the contrary, good ethical business practices benefit various stakeholders, including companies themselves (Leelhaphunt and Suntrayuth, 2020), employees and even nations (Ip, 2010).

There is diversity in the conceptualisation and practice of business ethics worldwide (Sardy et al., 2010). Likewise, ethical concerns differ especially across countries from Western and Eastern cultural hemispheres, thereby giving rise to the so-called East-West dichotomy in ethics (Gift et al., 2013; Pattberg, 2013). That is, while Western ethics descend from the Aristotelian (Ancient Greek) and Christian heritage, Eastern (or Asian) ethics are heavily influenced by Confucian teachings (Alzola et al., 2020; Nguyen and Yeh, 2022).

With 91.6% of the population self-identifying as ethnic Chinese (Census and Statistics Department, 2021), Hong Kong is commonly classified as a 'Confucian society' (e.g., Lam and Shi, 2008). Ex-post Hong Kong's return to China in 1997, business activities between Hong Kong and Mainland China have been on an upward trajectory, while the reports of corruption, 'under table dealings' and guanxi[2] increased significantly (Dunfee and Warren, 2001; Tang and Chiu, 2003; ICAC, 2022). Furthermore, unethical business practices, 'window dressing' and poor governance in China are notorious (e.g., Sayari and Marcum, 2018; Wang et al., 2018). As a result, there have been concerns about a potential rise in corruption and a decline in business ethical standards in Hong Kong (e.g., Snell, 1999; Phau and Kea, 2007).

Robust evidence highlights the rejuvenation of Confucianism and its virtues among business leaders and scholars in China (e.g., Yang et al., 2020). Prior studies document the positive effects of Confucian virtues on businesses' competitiveness (Tian et al., 2022), profitability (Wang et al., 2020) and ESG performance (Fu et al., 2022). However, while large and rapidly-growing literature examines the issue of business ethics in China (e.g., Gift et al., 2013; Berger and Herstein, 2014; Wang et al., 2018) comparatively little attention has been devoted to Hong Kong.

Moreover, studies on Hong Kong's business ethics usually focus on a specific company or industry and provide a cross-sectional view at a single point in time (e.g., Lam and Shi, 2008; Resick et al., 2011; Tian et al., 2022). However, how business ethics evolves over a longer period remains virtually unexplored.[3] Such a lack of longitudinal research constitutes a gap in the literature because business ethics and its practices are not static (Paik et al., 2019), but instead a function of time and culture (Berger and Herstein, 2014). Furthermore, many prior studies employ small, non-generalisable samples and use a scenario method based on unrealistic assumptions (e.g., Nyaw and Ng, 1994; Snell et al., 1999; Au and Wong, 2000; Ebrahimi et al., 2005; Ramasamy et al., 2013).

Given Hong Kong's ethical affiliations and unique socio-political and economic developments, there is a strong rationale for a longitudinal study providing a long-term forecast of business ethics framed in Confucian virtues. The distribution dynamics analysis (hereafter DDA) is used in this work because it can provide important details about how distributions evolve. Although the econometrics approach is frequently used in other studies, it is important to note that it cannot forecast the shape of a distribution, whereas DDA can reveal distribution dynamics and also offer forecasts and the underlying trend on the future shape of the distribution in great detail. Therefore, the DDA technique can complement existing research and provide a fresh perspective in this field of study.

This research contributes to business ethics literature by addressing the above-outlined methodological shortcomings and gaps. The employed data are proprietary and offer a generalisable, representative, and longitudinal view of the general society on how 206 companies across seven major industries performed in business ethics

between 2012 and 2016. Specifically, we employ a structured questionnaire consisting of items concerning the five virtues of *Junzi*[4] in the firms' context. The final sample of 10,773 interviews has been transformed into the relative Confucian business ethics score (hereafter RCBES), i.e., a summary score of the perceived business ethics level of the company. To the best of our knowledge, this study is the first to employ the DDA with its two display tools; ergodic distribution and mobility probability plot (MPP) to provide a detailed forecast of the long-term evolution (convergence versus divergence) of business ethics in Hong Kong.

The findings can be summarised as follows. First, most of the sampled companies are subject to a slow-pace long-run convergence process towards a business ethics level slightly above the sample's average. This means that we could expect many businesses in Hong Kong to become slightly more ethical in the future. Second, we document the emergence and migration of two convergence clubs. Specifically, the results suggest that while most of the companies will congregate around RCBES slightly above the average level, a small group of businesses will converge towards RCBES significantly below the average. Third, the annual analyses reveal that by far the most significant change and improvement in business ethics' long-term outlook took place between 2012 and 2013. Summing up, this study provides nascent longitudinal evidence for practitioners, business leaders and policymakers concerned with business ethics in Hong Kong.

The rest of this paper is structured as follows. In Section 2, we review the work done by others on business ethics in Hong Kong with its shortcomings. Section 3 discusses the data and analytical framework employed. The empirical results are then presented and discussed in Section 4, while Section 5 concludes the paper and offers potential avenues for future research.

2 Literature review

2.1 Business ethics in Hong Kong

Ferrell and Gresham (1985) posit that to examine business ethics, one needs to look at cultural context rather than attempting to uncover universal moral principles. Moreover, the social cognitive theory model argues that business ethics depends on the interaction among the specific environment, person, and behaviour in a social context (Bandura, 1986). Anecdotal and empirical evidence also suggests that there is diversity in the conceptualisation and practice of business ethics worldwide (e.g., Sardy et al., 2010).

While there is a significant and rapidly-growing body of literature looking into the issue of business ethics in China (e.g., Dunfee and Warren, 2001; Gift et al., 2013; Berger and Herstein, 2014; Wang et al., 2018) comparatively little attention has been devoted to Hong Kong. Dolecheck (1992) examines business employees' attitudes towards business ethics in Hong Kong vis-à-vis the USA. The results indicate that compared to the USA, Hong Kong respondents are more likely to have different ethical standards at work than in private life. Furthermore, Hongkongers equate ethics with remaining within legal boundaries, while valuing victory over competitors and business ethics. McDonald (1995) documents similar results, i.e., Hong Kong managers portray business ethics as staying within lawful boundaries (e.g., no theft and no bribery). In a survey of business students from Canada, Japan, Hong Kong and Taiwan, Nyaw and Ng (1994) investigate the extent to which people from different countries react to various ethical dilemmas.

The authors find that Hongkongers and Canadians are more likely to engage in whistle-blowing activities and react ethically toward their competitors than Japanese and Taiwanese students. On the other hand, compared to other groups, Hongkongers display the lowest proclivity to react ethically toward their customers and suppliers.

Snell (1999) looks at the way Hong Kong Chinese staff tackles ethical dilemmas arising from a request by their work superiors to act unethically. His findings based on 39 interviews indicate that obedience to authorities at work is related to the cultural norms of 'saving face' and preserving harmony which, in turn, can constitute a threat to the future business ethics standards in Hong Kong. Snell et al. (1999) conduct two surveys of managers from 17 Hong Kong-based companies over the twelve months (Dec. 1995–Dec. 1996) preceding the handover of Hong Kong from the UK to China. The authors find some evidence of potential deterioration in 'moral ethos' but no evidence of a decline in the perceived level of companies' moral conduct. Au and Wong (2000) find that under the impact of guanxi, even auditors who previously behaved in a professionally ethical manner will act in a professionally less acceptable way. However, Ebrahimi et al. (2005) in a survey study on business degree students establish that the ethical orientation of respondents is positively correlated with their level of respect for the authorities. Tang and Chiu (2003) find that the love of money rather than economic pressure or money per se is the root of unethical behaviour among Hong Kong employees. Ramasamy et al. (2013) report that Confucian values orientation is positively associated with Chinese consumers' support of CSR in Hong Kong, Shanghai and Singapore. However, other studies (e.g., Tsoi, 2010) document that business ethics, as reflected in CRS measurements, is considered less important in the Asia-Pacific region than in the West.

2.2 Confucian virtues and business ethics

Character-based and person-centred virtue ethics is the most prominent normative theory in business ethics (Kwong et al., 2015). While Western virtue ethics is based on the Aristotelian and Christian heritage, Eastern (or Asian) virtue ethics is largely influenced by Confucian teachings (Pattberg, 2013; Alzola et al., 2020; Nguyen and Yeh, 2022). Accordingly, prior studies document significant differences in conceptualisations and practices of business ethics between countries falling under the Western vis-à-vis Eastern virtues sphere of influence (e.g., Dolecheck, 1992; Resick et al., 2011). Confucian ethics focuses on developing moral qualities (virtues) in individuals (Alzola et al., 2020). Confucian society shares a belief that if a person has good character, he or she will behave ethically; similarly, if a business organisation has good character, it will behave ethically (Tian et al., 2022).

In the context of consumption, Chinese consumers expect firms to adhere to Confucian virtues in their business practices (Sun et al., 2016). Confucian virtues have been explicitly adopted as codes of business ethics in some business organisations across Asia (e.g., Tsai et al., 2011). In a cross-country survey, Resick et al. (2011) report that Hong Kong managers identify the character, collective orientation, and respect for others as the main traits of ethical leadership. The authors argue that their findings highlight the influence of Confucian ideology on Hong Kong managers. Other researchers document positive associations between adherence to Confucian ethics and businesses'

competitiveness (Tian et al., 2022), profitability (Wang et al., 2020) and ESG performance (Fu et al., 2022).

One of the most important concepts in Confucian philosophy is Junzi or the 'noble man' with high moral integrity (Chou and Cheng, 2020). Specifically, the concept of Junzi is built on five virtues consisting of benevolence (ren), righteousness (yi), propriety (li), wisdom (zhi) and trustworthiness (xin).[5] Kwong et al. (2015) find that by adhering to the three Junzi virtues (ren, yi and li), Hong Kong companies are more likely to enjoy customer loyalty. Liu and Stening (2016) argue that all five virtues of Junzi are pertinent to business ethics in Chinese societies. In a case study of a Taiwanese corporation, Chou and Cheng (2020) show that in line with the five virtues, Confucian leadership is characterised by humanistic practices towards the company's stakeholders. Tian et al. (2022) establish a positive association between the Junzi orientation of Hong Kong businesses and their performance.

2.3 Motivations

While ample and fast-growing literature examines business ethics in China (e.g., Gift et al., 2013; Berger and Herstein, 2014; Wang et al., 2018), the issue of business ethics in Hong Kong remains underexplored. Additionally, the above-reviewed studies utilise small or non-generalisable samples (e.g., Dolecheck, 1992; Snell et al., 1999; Ebrahimi et al., 2005; Ramasamy et al., 2013). However, such samples would inhibit the generalisability of the results (O'Fallon and Butterfield, 2005). Moreover, surveyed or interviewed managers and employees may feel uneasy about reporting unethical behaviours (Tang and Chiu, 2003) which, in turn, could lead to a biased result suggesting that people are more ethical in the workplace.

Another potential shortcoming of the extant literature on business ethics is associated with many prior studies using the hypothetical scenario-based technique (e.g., critical incident) as their methodological approach (e.g., Nyaw and Ng, 1994; Au and Wong, 2000). As Marshall and Dewe (1997) point out, the application of the scenario method implies two main assumptions:

a the situation depicted in the scenario presents an ethical dilemma faced by the respondent

b the context surrounding the situation is the same across all respondents.

However, according to, e.g., O'Fallon and Butterfield (2005), these assumptions are often unrealistic and thus inappropriate. Instead, it may be more suitable to ask people to assess the extent to which organisations operate ethically based on their real experience.

Except for Snell et al. (1999) who carried out two surveys over 12 months, all studies examining business ethics in Hong Kong, adopt a cross-sectional approach (e.g., Lam and Shi, 2008; Resick et al., 2011; Tian et al., 2022). Notwithstanding, multi-year, long-term longitudinal research on business ethics is important for two reasons. First, business ethics and its practices are not static (Paik et al., 2019), but instead a function of time and culture (Berger and Herstein, 2014) and as such may change dynamically. As mentioned in the previous section, given the social and economic transitions in Hong Kong, it is worthwhile doing longitudinal research on Hong Kong's business ethics. Second, business ethics studies involve either students', employees', or managers' attitudes, which can be easily influenced by common method variance bias. A longitudinal design

in conjunction with a representative sample gauging the opinions of the general population should reduce these systematic errors due to common method variance biases (Rindfleisch et al., 2008), thereby enhancing the validity of results.

This study aims to address the above-listed methodological shortcomings and gaps in the existing literature by employing a longitudinal (2012–2016), representative and generalisable sample. Specifically, the final sample consists of 10,773 interviews providing a unique insight into general society's opinion on how 206 major Hong Kong companies performed in business ethics between 2012 and 2016.

3 Data and methodology

3.1 Sampling

The sampling strategy was designed to obtain a longitudinal and representative sample of the general population. Sampling the general population on business ethics is less likely to suffer from social desirability biases because society (unlike business managers and employees) has little incentive to inflate the ethical standards in the business. Specifically, the data was collected by using a face-to-face intercept-interview method as a part of a large-scale research project on business ethics in Hong Kong. Each year, 50–70 undergraduate students were recruited and trained to assist in the fieldwork as interviewers. Experienced interviewers from previous years were recruited to act as both interviewers and leaders in subsequent years.

To ensure a representative sample was collected every year, a three-stage area-sampling plan was deployed to generate a representative sample of the Hong Kong population every year. The sampling frame followed the constituency boundaries delineated by the Registration and Electoral Office for district-council elections and constituency maps were obtained from the Electoral Affairs Commission. Furthermore, each of Hong Kong's 18 districts was divided into smaller constituencies with similar population sizes, giving a total of over 400 constituencies. Accordingly, random samples were drawn from roughly 10% of the constituencies in each of the 18 districts.

Within each constituency, interviewers were instructed to sample public transport exit points (bus stops, mass transit railway exits, ferry terminals, tram stops, etc.), and sampling points were randomly selected through simple random sampling on an hourly basis. Following the intercepted protocol, individuals were approached as they entered the sampling areas, based on systematic random sampling. In short, this area-sampling approach combined stratified random sampling and systematic random sampling to generate a representative sample (Urban and Van Eeden-Moorefield, 2018). Furthermore, the quota was applied in the recruitment process to reduce interviewer bias. Specifically, the sample was constructed to resemble the age and gender distribution of the adult population in Hong Kong each year. Accordingly, nearly half of the respondents were men (48%) while around 34%, 20%, 18%, 16%, and 12% of the respondents were in the age group of 18–29 years, 30–39 years, 40–49 years, 50–59 years, and 60 years or above. Additionally, to minimise periodicity and non-coverage problems, the interviews were conducted at different hours of the day and on different days of the week (e.g., Pappu and Quester, 2008).

As this is a study of Confucian virtues in the modern business context and the targeted population was Chinese, it was natural that the interviews were conducted in

Chinese. Thus, the questionnaire was first prepared in English and then translated into Chinese using the standard back-translation procedure as suggested by Brislin (1980) with the assistance of professional translators. Onsite supervision and coaching to monitor and facilitate the administration of the questionnaire survey were also provided. All these procedures were implemented as an integrated effort in raising data quality. One of the authors was the chair of a committee overseeing the data collection to ensure the data collection process over the years was of high and consistent quality and validity.

3.2 Measurement

A structured questionnaire was designed to measure the general public's assessment of the business ethics level in Hong Kong through the lens of the Confucian virtues of Junzi with the questionnaire items either self-developed or adopted from the Confucian classics (Chinese Text Project, 2022). The questionnaire had three sections:

1 screening questions

2 measures of the constructs of interest

3 questions soliciting demographic information.

Each of the interviewees was asked the same set of questions about 206 major companies (each company individually) in Hong Kong. The original items were measured by a seven-point Likert scale (from 1 to 7), where a higher value implied higher ethical standards (after reverse coding if necessary). Each questionnaire was then converted into a total numerical value (potentially ranging from 0 to 100) by combining the score of all five virtues of *Junzi* (equally weighted), such that if the company scores all ones, then the total score is zero.[6]

The final sample consisting of 10,773 interviews collected annually over five years between 2012 and 2016, inclusively, was then translated into a company-level Confucian business ethics score (hereafter CBES), i.e., a summary score of the perceived business ethics level for each of 206 companies. In other words, the final sample represents the general public's perception of the business ethics performance of 206 major companies embedded in Hong Kong's daily life. These companies come from the following seven industries covering a wide range of businesses:

1 supermarkets and retail

2 food and catering

3 banking and financial services

4 transportation and public services

5 hospitality and tourism

6 online and offline media

7 real estate and property agencies.

Such a diversified business portfolio should be well-suited for tracing Hong Kong's general business ethics over the years.

Table 1 lists the industries with their respective average annual CBES and the number of respective companies. We can observe that the perceived business ethics is subject to

divergent inter-industry annual fluctuations. Specifically, five industries (retail, catering, finance, transportation and public, and property) recorded an improvement over the period of investigation, while two industries (hospitality and tourism and media) declined in terms of their CBES. Furthermore, all the industries performed the best (worst) in the initial (penultimate) year of study, that is 2012 versus 2015. The documented changes can be the outcome of many socio-economic and political factors which are beyond the scope of this study. For instance, the poorest annual CBES in 2012 across all the industries corresponds to the peak in the total corruption complaints logged to the Independent Commission Against Corruption (ICAC) in 2011 (4,010) and 2012 (3,932), followed by a significant decline in the latter years covered in the sample (ICAC, 2022).

Table 1 Average annual CBES in seven industries between 2012 and 2016

Industry	*Number of companies*	*Average annual Confucian business ethics score (CBES)*				
		2012	*2013*	*2014*	*2015*	*2016*
Retail	30	61.7	67.4	64.9	67.9	64.3
Catering	30	59.4	61.4	62.1	66.5	64
Finance	30	59.2	64.3	62.7	66.6	62
Transportation and public	29	59.5	66.9	63.7	69.2	61.6
Hospitality and tourism	30	62.9	66.9	62.9	67.9	61.1
Media	27	61.5	68.7	65	68	59.8
Property	30	45.9	58.4	55.9	57.8	54.7

Source: Authors' calculations

The average values of all 206 companies' CBES were computed for each year, and then the value of each company-specific CBES was further divided by the corresponding yearly average to calculate the relative value of each company's CBES for a particular year. Therefore, if the relative value is equal to 1, it means that the value of that company's CBES is equal to the mean of all the companies in a given year. By the same token, a value greater (smaller) than 1, implies that the value of that company's CBES is higher (lower) than the sample's mean. This procedure enables easy identification of the relative level of business ethics performance for each company. Furthermore, the relative Confucian business ethics score (hereafter RCBES) measurement is used as the input to generate the display tools of the DDA which will be discussed in detail in the next section.

3.3 Analytical framework

The DDA approach developed by Quah (1993) has several important merits. First, the DDA can provide detailed information on the evolution of the studied variable's distribution. Second, the mobility of the entities within the distribution can be examined in detail. Third, the DDA offers a forecast for the shape of the steady-state, long-run (ergodic) distribution. This, in turn, enables the inference of future trends (e.g., convergence and divergence) in the examined variable (Maasoumi et al., 2007; Wojewodzki et al., 2023).

It is important to note that when DDA is used to analyse a factor's influence, the data must be divided into smaller datasets, while beta convergence enables one to explicitly

control for the factor. However, beta convergence analysis can only provide information on the factor's beta value and its level of significance, without any information on the changes in the shape of the distribution, while DDA can show these changes.

As for the sigma convergence technique, it may provide a statistic for the degree of inequality, and by tracking the evolution of the statistic, one can study convergence over time. When compared to the sigma convergence technique, which turns the entire distribution into statistics, DDA may produce a two-dimensional figure by describing the distribution. As a result, it can provide more information. Besides, beta and sigma convergence analyses are deemed by some scholars as distorted or inadequate evidence of convergence (e.g., Quah, 1993; Maasoumi et al., 2007).

The DDA can be divided into the traditional Markov transition matrix analysis and the stochastic kernel approach. However, one weakness of the former approach is that the demarcation of the group associated with the selection of grid values is somewhat arbitrary. The latter approach is thus deemed to be superior as it can tackle the thorny issue of demarcation. Furthermore, one can view the stochastic kernel approach as an extension of the traditional Markov transition matrix analysis with two major improvements; the infinite number of states and the exclusion of the arbitrary step in choosing the grid values (for more details, please refer to Cheong and Wu, 2018). Summing up, the stochastic kernel approach is used in this paper because of its merits. The bivariate kernel estimator can be defined as follows:

$$\hat{f}(x, y) = \frac{1}{nh_1h_2}\sum_{i=1}^{n} K\left(\frac{x - X_{i,t}}{h_1}, \frac{y - X_{i,t+1}}{h_2}\right) \tag{1}$$

where n is the number of observations, X_i is the RCBES value of a company at time t, Y_i is the RCBES value of that company at time $t + 1$, K is the kernel function, and h_1 and h_2 are the respective bandwidths. The computation of the bandwidths is based on the procedures suggested by Silverman (1986). Assuming that the distribution is of the first order[7] and time-invariant, we can derive the density function as shown in equation (2).

$$f_{t+\tau}(z) = \int_0^{\infty} g_\tau(z \mid x) f_t(x) dx \tag{2}$$

where $f_{t+\tau}(z)$ is the τ-period-ahead density function of z conditional on x, $g_\tau(z \mid x)$ is the transition probability kernel which maps the distribution from time t to $t + \tau$, while $f_t(x)$ is the density function of the distribution of the RCBES value of all the companies at time t. By the repeated use of equation (2), one can compute the long-run distribution where the time τ approaches infinity. Such distribution is called the ergodic distribution and shows the final stage of evolution in the distribution given that the transitional dynamics remain unchanged. Therefore, the ergodic distribution can be computed as follows:

$$f_\infty(z) = \int_0^{\infty} g_\tau(z \mid x) f_\infty(x) dx \tag{3}$$

where $f_\infty(z)$ is the ergodic function with infinite τ, representing the distribution of the RCBES in the long-run steady-state equilibrium. One of the potential hurdles when applying stochastic kernel analysis is the number of episode transitions in the data. Quah (2001) suggests that it is better to employ annual transitions as it can increase the number of samples so that the estimation is more reliable. Moreover, it can avoid the pitfall of transient fluctuations in the data (Quah, 2001).

Another crucial issue is the shape of the distribution. It should be noted that many distributions of indicators are not normal but skewed. Moreover, one can expect outliers with either extremely high or low values. This is a pivotal issue as the estimation of the kernel can be affected adversely in the region of the tail. Therefore, the sophisticated approach of the adaptive kernel with flexible bandwidth is adopted in this study to circumvent that thorny issue. It involves two steps in computation as follows. The data is first used to calculate a pilot estimate, and then the bandwidth is rescaled by a factor which is dependent on the density of the kernel. Although this approach is more complicated, it tackles the sparseness of the data which, in turn, makes the forecast significantly more accurate, especially for the regions with very little data (Silverman, 1986).

There are many traditional display tools of the stochastic kernel approach, e.g., the contour map, the three-dimensional plot, the highest density region plot, and the stacked conditional density plot. However, none of the above display tools can present the comparison results clearly in a single combined figure. Cheong and Wu (2018) develop a new approach for presenting the findings derived from the DDA called the mobility probability plot (hereafter MPP) which can show the comparison results clearly as several MPPs can be superimposed in the same figure. Moreover, the MPP can provide detailed information on the probability mass, by providing a direct visual representation of the probability of net upward movement of the entity's RCBES within the distribution.

Due to its merits over traditional tools, the MPP has been recently employed in various areas of empirical research. For example, the MPP tool has been used to analyse electricity consumption (Cheong et al., 2019), country-level information transparency (Williams et al., 2022), housing affordability (Liu et al., 2022) and even companies' credit ratings (Lee et al., 2021). The MPP can be calculated as presented in equation (4) below.

$$p(x) = \int_{x}^{\infty} g_{\tau}(z \mid x)dz - \int_{0}^{x} g_{\tau}(z \mid x)dz \tag{4}$$

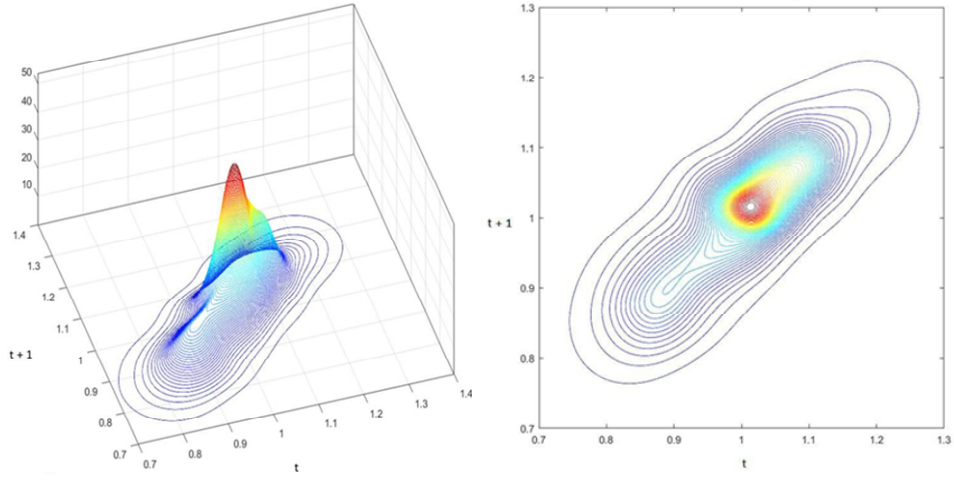
where $p(x)$ is the net probability of upward mobility. Specifically, the MPP shows the probability of net upward mobility (measured by the *Y*-axis) for the whole spectrum of company-level RCBES values (the *X*-axis). The net upward mobility probability is the sum of the probability values of moving upwards minus the sum of the probability values of moving downwards. Furthermore, it is conveniently expressed in percentages and ranges from –100 to 100 such that a positive (negative) value means that the company will have a net probability of moving upwards (downwards) within the distribution in years to come.

4 Results and discussion

The transitional dynamics of company-level RCBES based on annual data from 2012 to 2016 are presented in Figure 1 as a three-dimensional plot (Panel A) and a two-dimensional contour map (Panel B). Specifically, the right-hand, left-hand, and vertical axes in Panel A, show the RCBES values in year t, $t + 1$, and the height of the stochastic kernel, respectively.[8] Moreover, the different colours indicate different densities/heights of the stochastic kernel such that with increasing density (moving from

the lowest to the highest), the blue colour transitions into green, then yellow and eventually into the red colour.

Figure 1 (a) Three-dimensional plot and (b) two-dimensional contour map of transition probability kernel for company-level RCBES based on the 2012–2016 period (see online version for colours)



(a) (b)

Note: The horizontal axis represents the RCBES values at time t, whilst the vertical axis represents the RCBES values at time $t + 1$.

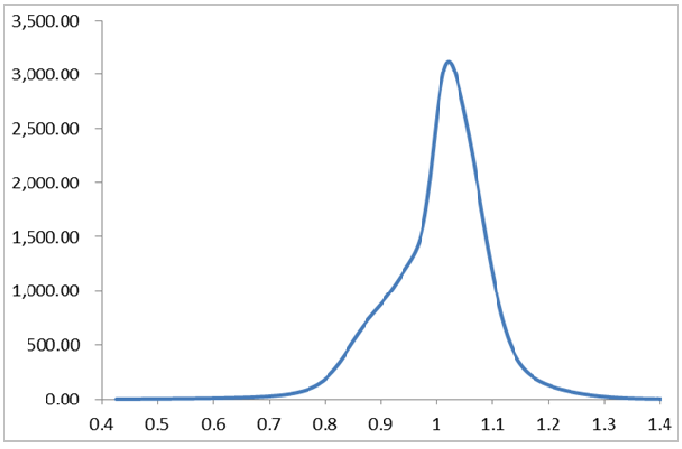
Source: Authors' calculation

Figure 1 shows that the outermost contour line stretches from the RCBES value of 0.7 to 1.3. Because the RCBES is calculated relative to the sample's mean which equals 1, the smallest (largest) RCBES value of 0.7 (1.3) indicates the CBES significantly below (above) the average level. Moreover, we can observe that the stochastic kernel has one major peak located around the RCBES value of approximately 1.05, i.e., just above the sample's average value. This result highlights that many entities tend to cluster around the RCBES value very close to the sample's mean.

Furthermore, looking at Figure 1, one can observe that the density mass is largely concentrated along the 45 degrees main diagonal. This, in turn, implies that most of the entities (companies) tend to remain in their current positions with little change in the coming periods. Therefore, the convergence process or mean reversion in RCBES will be slow and spread over many years.

The ergodic distribution shown in Figure 2 represents the future long-run steady-state equilibrium in RCBES under the assumption of unchanged transitional dynamics. We can observe that the distribution is unimodal with the peak located centrally around the RCBES value of 1.02. This result is consistent with the results from Figure 1 and translates into the long-run converge process towards the mean value equal to one. The observed convergence is preferred since it implies that a majority of the entities will have their CBES close to the mean, thereby suggesting a lower disparity.

Figure 2 Ergodic distribution for RCBES based on the 2012–2016 period (see online version for colours)



Note: The horizontal axis represents the RCBES values, whilst the vertical axis measures the proportion.

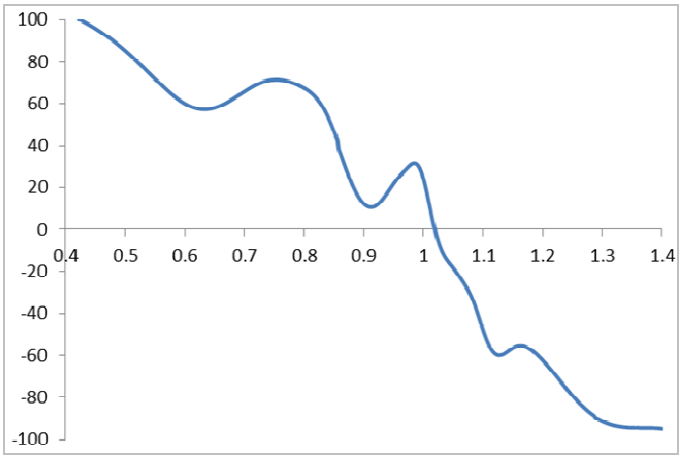
Source: Authors' calculation

Because the probability mass displayed in Figure 1 is scattered along the diagonal, it is difficult to determine in detail where the greatest portion of the probability mass lies. This problem can be effectively solved with the MPP tool which offers a direct visual interpretation of the probability mass. Specifically, the MPP shows the net probability of upward (improvement) or downward (deterioration) movement of the company's perceived RCBES in years to come. In other words, a positive value (MPP above the horizontal axis) suggests an improvement in business ethics in the future, while a negative value (below the horizontal axis) means that business ethics will deteriorate.

The MMP for the RCBES based on the full period of examination (from 2012 to 2016) is shown in Figure 3. We can see that the entities with the RCBES values below (above) 1.02 have a probability of moving upwards (downwards) in the distribution in the coming years. In other words, the Hong Kong firms with below the mean RCBES values have a net tendency to improve their relative ethical performance in the future and as such converge towards the average level of business ethics in Hong Kong. On the other hand, the results highlight that the companies with RCBES values greater than 1.02 have a net tendency to deteriorate in the future in terms of their relative ethical performance. We can observe that the MPP reaches the net upward probability of –100 (so-called 'development trap') over the range of the greatest RCBES values between 1.3 and 1.4. This suggests that once the entity achieves such a relatively high standard of business ethics, it is destined to experience a decrease in its RCBES, i.e., a 100% probability of moving downward in the distribution in the coming years.

Furthermore, the positioning of the MPP and its only intersection with the horizontal axis at the RCBES value of 1.02, indicates that many entities will move and assemble around the intersection point. This is in line with the interpretation drawn from the ergodic distribution presented in Figure 2. Therefore, the results observed in Figures 2 and 3 suggest that the shape of the ergodic distribution is determined by the transitional dynamics as reflected through the movement of MPP.

Figure 3 MPP for RCBES based on the 2012–2016 period (see online version for colours)



Note: The horizontal axis represents the RCBES values, whilst the vertical axis represents the MPP (%).

Source: Authors' calculation

Summing up, Figures 1, 2 and 3 collectively paint an optimistic picture from the perspective of convergence to the mean. Therefore, assuming no changes in the transitional dynamics of RCBES, the policymakers should focus on new motivations, strategies and policies aiming at further improvement of the ethical business practices (absolute CBES values) in Hong Kong.

Hong Kong's return to China in 1997 has been followed up by robust growth in business activities with the Mainland. However, concurrently, the incidents and claims of corruption and other unethical behaviours also increased (see, e.g., ICAC, 2022). Such a worrying trend might be associated with unethical business practices migrating from the Mainland to Hong Kong. Consequently, there are concerns about a potential rise in corruption in Hong Kong and deterioration in its business ethics standards (e.g., Snell, 1999; Phau and Kea, 2007).

Business ethics has recently received more attention in Hong Kong with collaborative efforts of the government, the business community, non-governmental organisations (NGOs) and non-profit organisations (NPOs) trying to promote and elevate business ethics to a new altitude.[9] It is therefore of interest to examine the transitional dynamics during the period of investigation to understand more about the evolution of business ethics in Hong Kong. Accordingly, the full sample period is divided into five annual sub-periods: 2012, 2013, 2014, 2015 and 2016. The MMPs and the ergodic distributions based on these sub-periods are shown in Figures 4 and 5.

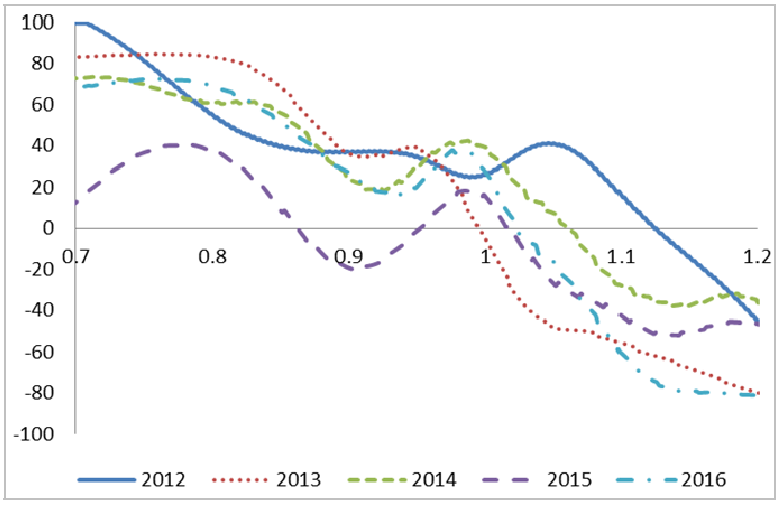
We can observe that the blue solid line MPP for the earliest period (2012) lies above the horizontal axis over the longest range of RCBES values stretching from 0.7 to 1.12. Furthermore, the 2012 MPP lies significantly above the other four MPPs for the smallest below the mean RCBES values (from 0.7 to 0.74) and the largest above the mean RCBES values (from 1.02 to 1.18). This means that in 2012 the companies perceived as the least ethical had the highest tendency to move upward in the distribution in the coming year. By the same token, the most ethical entities had the highest (lowest) proclivity to move

upward (downward) in the distribution. Additionally, it can be expected that the ergodic distribution of 2012 should be more dispersed than those of 2013 to 2016.

From convergence to the mean viewpoint, the transitional dynamics of RCBES for major Hong Kong companies looked the most promising in 2013. That is because the red dotted-line MPP intersects with the horizontal axis only once around the mean RCBES value of 1, whilst the plot slopes steeply upwards (downwards) on the left (right) from the intersection point.

Regarding 2014, we can observe that the intersection between the green-coloured MPP for that year with the horizontal line has moved rightward in comparison with the MPP for 2013. Specifically, we can observe that in 2014, the MPP intersects the horizontal axis above the RCBES mean value of 1.06. This, in turn, suggests the migration in expected convergence for companies' business ethics standards between 2013 and 2014 from the mean value to the RCBES value of 1.06.

Figure 4 MPP for RCBES based on the annual sub-periods: from 2012 to 2016 (see online version for colours)



Note: The horizontal axis represents the RCBES values, whilst the vertical axis represents the MPP (%).

Source: Authors' calculation

Figure 4 shows a significant deterioration in the ethical performance of Hong Kong businesses in 2015. For instance, we can observe three intersections between the purple-coloured MPP and the horizontal axis located at RCBES values of 0.87, 0.95 and 1.02. This means that only entities with RCBES values below 0.87 and greater than 0.95 but lower than 1.02 have positive net upward mobility probabilities. By the same token, the entities with a range of below the mean RCBES values between 0.87 and 0.95 have negative net upward mobility probabilities, i.e., the worrying tendency of further decline in their relative business ethics standards. The companies with RCBES values around 0.9 (the trough of purple-coloured MPP) present the highest probabilities of up to 23% to move downward in the distribution and diverge further away (below) the average standard of business ethics. Moreover, because of the properties of the MPP tool, we can expect that many Hong Kong companies will congregate around RCBES values close to

the intersection points in the coming years. Another pessimistic piece of information is associated with entities with the lowest RCBES value of 0.7 having a low (below 20%) probability of moving upward in the distribution, i.e., converging towards the average level of business ethics standards.

Moving on to the MPP representing the most recent year of investigation (2016), it plots similar to MPPs for 2013 and 2014, while intersecting with the horizontal axis at the RCBES value of 1.025 – that is only slightly above the mean. Additionally, the most recent MPP lies significantly above the MPP for 2015 for a large range of RCBES values: from 0.7 to 1.05. Thus, the presented results suggest that the business ethics performance for most entities improved visibly in 2016 as compared with 2015. Such a positive development in the most recent year of investigation is consistent with a documented improvement in Hong Kong's Corruption Perceptions Index for the corresponding period (Transparency International, 2022).

Summing up, Figure 4 highlights that except for 2015, during the period of investigation the lower the company's RCBES value in one year, the greater the probability that its RCBES will improve in the next period. On the other hand, the larger the company's RCBES in the current year, the smaller (greater) the net tendency that its relative business ethics standards will further improve (deteriorate) in the following year. From the perspective of convergence to the mean, such a general pattern constitutes a positive piece of evidence.

Figure 5 shows that all five ergodic distributions are bimodal, i.e., with one major and one minor peak. This result signifies the emergence of two convergence clubs (conditional convergence) and their fluctuations over time. A more detailed inspection highlights interesting differences among the distributions. Specifically, the major peak of the ergodic distribution for 2012 and 2013 (Panels A and B) has the lowest and greatest height, respectively. Such disparity translates into a substantial change in the long-run steady-state equilibrium of RCBES during just one year with the least (most) significant convergence process in RCBES in 2012 (2013).

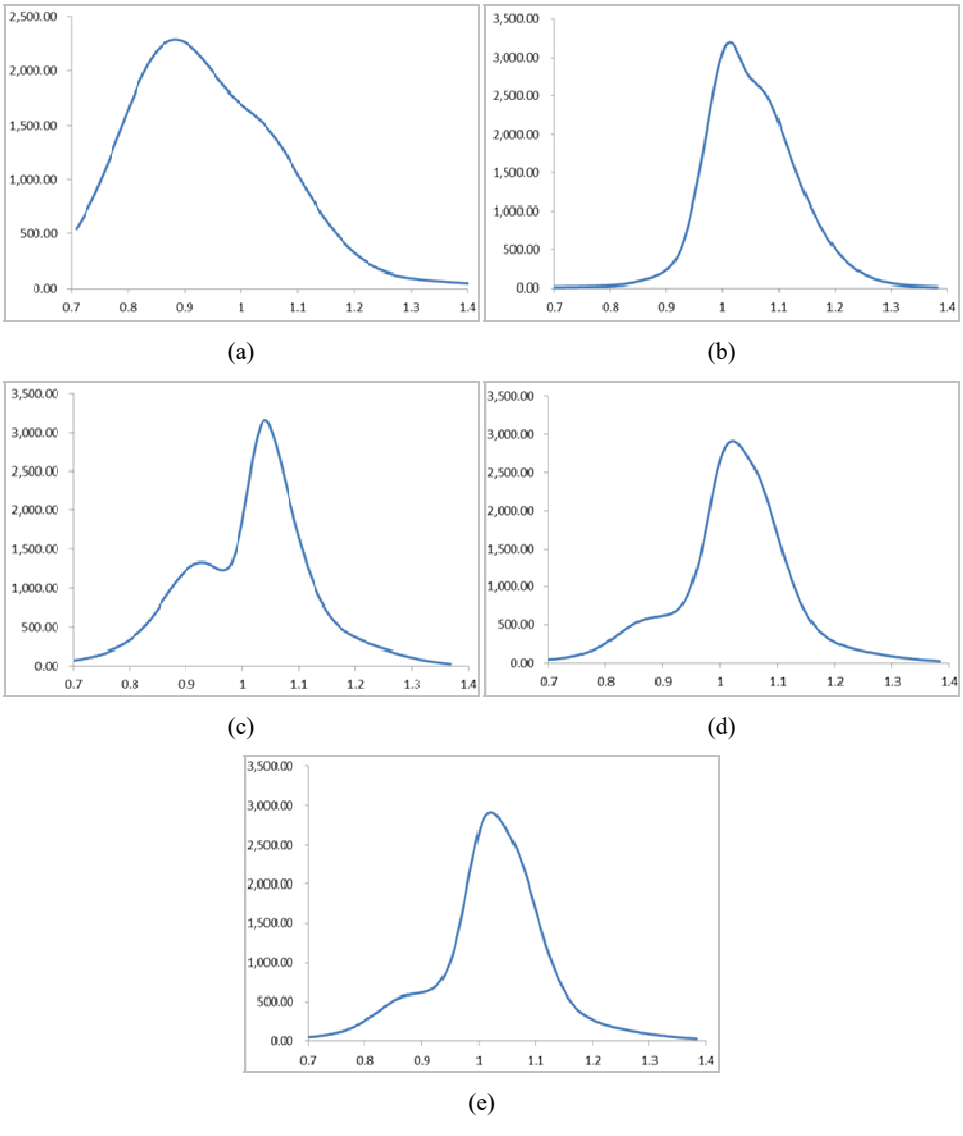
Another important change occurring between the first two years of investigation is the location of the peaks or the migration of convergence clubs. Specifically, one can observe that the major peak has moved from below the average RCBES value of around 0.87 in Panel A to above the average RCBES value of 1.02 in Panel B. A similar (although of smaller magnitude) movement toward a larger RCBES value applies to the minor peaks located at the RCBES values of 1.05 (1.08) in ergodic distribution for 2012 (2013). The above disparities suggest a significant change and improvement in business ethics' long-term prospects taking place between 2012 and 2013.[10]

Furthermore, Figure 5 shows that the ergodic distributions for the most recent years of examination (2015 and 2016) are virtually identical, which suggests a potential stabilisation in the transitional dynamics of RCBES. Specifically, we can observe that the major (minor) peak in Panels D and E is located at the RCBES value of 1.02 (0.87). Therefore, one might expect that in the long-run, the majority of entities will converge towards relative business ethics slightly above Hong Kong's average level, while a smaller group of entities will follow a different path by converging to a significantly lower level of business ethics.

Summing up, Figure 5 indicates an improvement in cross-company business ethics in Hong Kong and a long-run convergence nearby the average level, assuming the transitional dynamics remained unchanged. Furthermore, we can expect the emergence of two convergence clubs which might pertain to the proclivities of companies from

industries with similar attributes to cluster. Furthermore, the limitations or barriers may prevent one group of companies from moving to a higher convergence club. This indicates that attainment of the RCBES could be affected by the nature of the business sector and requires further inter-industry analysis.

Figure 5 Ergodic distribution for RCBES based on five annual periods, (a) 2012, (b) 2013, (c) 2014, (d) 2015, and (e) 2016 (see online version for colours)



Note: The horizontal axis represents the RCBES values, whilst the vertical axis measures the proportion.

Source: Authors' calculation

5 Conclusions

This study initiates the application of the display tools of the DDA (ergodic distribution and MPP) in the investigation of business ethics. Accordingly, this research provides empirical evidence based on the annual Junzi index spanning over five years (2012–2016) and covering 206 major companies operating in Hong Kong. Because the Junzi index is based on a representative sample of 10,773 interviews gauging the opinions of the general population in a longitudinal setting, this study provides nascent representative and generalisable results revealing the long-term forecast trends of business ethics. Therefore, we extend previous research with findings based on smaller, often non-generalisable and cross-sectional samples.

The results can be summarised in three key findings. First, the transitional dynamics of the RCBES indicate that the businesses in Hong Kong are subject to a slow long-run convergence process towards the RCBES value of 1.02, i.e., slightly above the average level of business ethics equal to one. This, in turn, suggests that many Hong Kong businesses will become slightly more ethical in the long-run, while cross-companies' disparities in standards of business ethics will decline. Second, annual analyses reveal the emergence and migration of two convergence clubs, thereby implying only conditional convergence with some companies following a different path towards below-the-average CBES values. Specifically, two most recent annual analyses (2015–2016) suggest that the relatively smaller and larger group of companies will cluster around the RCBES values below (0.87) and slightly above (1.02) the average standard in the long-run. Third, the results suggest the most significant annual change/improvement in RCBES's long-term outlook between 2012 and 2013. On the contrary, annual analysis shows virtually identical and positive long-term outlooks in the most recent two years period (2015–2016).

Our findings might be of value to the policymakers, practitioners and business leaders in Hong Kong and help them recognise and implement Junzi virtues as a standard of business ethics. Furthermore, the documented fluctuations in RCBES could serve as a warning and an incentive to business leaders and policymakers who might consider the application of the DDA to monitor the general public's perception of companies' ethical standards on an annual basis.

This study does not come without limitations. Firstly, the implied long-run steady-state (ergodic) distributions and associated discussions rely on the assumption of no changes in RCBES' transitional dynamics. Secondly, due to data availability, the period of analysis and corresponding results are based on the politically and economically stable period of 2012 to 2016. However, Hong Kong experienced unprecedented social unrest significantly affecting its businesses and population between 2019 and 2020, while for the last three years (until early 2023), Hongkongers and to different degrees, local industries were greatly and usually negatively affected by COVID-19 outbreak and corresponding anti-pandemic measures. Such a backdrop warrants a follow-up DDA study of business ethics in Hong Kong covering the most recent period. Moreover, documented convergence clubs indicate that attainment of the RCBES might be affected by the nature of the business sectors, thus future research with industry-level analysis is required. Lastly, in the future, the researchers can apply the DDA display tools to other major Chinese and Asian cities.

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Notes

1 Skipping some safety assurance procedures to boost the production time of Samsung Galaxy Note 7 in 2016 has tarnished Samsung's reputation and led to several billion USD in losses. Similarly, the emission cheating scandal in which German car manufacturing giant Volkswagen has been embroiled cost various stakeholders tens of billions USD.

2 The term *guanxi* has been present in Chinese tradition for millennia. Lovett et al. (1999, p.231) succinctly describe *guanxi* as "networks of informal relationships and exchanges of favors that dominate business activity throughout China and East Asia."

3 A noteworthy exception is Snell et al. (1999) who carried out surveys during two periods: December 1995–March 1996 and July–December 1996.

4 Encyclopædia Britannica (2012) explains that according to Confucian teachings, the *Junzi* is "an exemplar whose virtuous influence promotes a flourishing human community (…) the junzi is not a commander of or ruler over inferior subjects but rather a moral person who leads by his character and conduct."

5 For more details on these five virtues see, e.g., Liu and Stening (2016) and Tian et al. (2022).

6 The validity and reliability of the Junzi questionnaire have been discussed in Kwong et al. (2015).

7 That means that the distribution at time $t + \tau$ depends on t only and not on any previous distribution.

8 Likewise, the vertical and horizontal axis in Panel B shows the RCBES values in period t and $t + 1$, respectively.

9 For the recent initiatives in the promotion and development of business ethics in Hong Kong, see HKBEDC (2022), IBES (2022), ICAC (2022) and JA Hong Kong (2022).

10 The above results are consistent with the largest annual decline of nearly 33% (from 3,932 in 2012 to 2,653 in 2013) in the number of corruption complaints lodged with the ICAC since its inception in 1975 (ICAC, 2022).