

Zhu, Guoyiming; Lei, Guangyong; Zuo, Jingjing

Article

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Clan culture and internal pay gap: evidence from listed family firms

Guoyiming Zhu^a, Guangyong Lei^b and Jingjing Zuo^c

^aSchool of Accounting, Guangdong University of Finance, Guangzhou, China; ^bBusiness School, University of International Business and Economics, Beijing, China; ^cBusiness School, Henan University, Kaifeng, China

ABSTRACT

Clan culture, as an enduring traditional culture in China, has a profound impact on the internal governance and sustainable development of family firms. This study reveals a significant positive relationship between regional clan culture and the pay gap within family firms. This relationship is primarily realised through the mechanism of internal trust. Moreover, the positive relationship is more pronounced in firms with local executives, same-name executives, and family members, as well as in regions with high marketing intensity, a thriving economic environment, and openness to the outside world. The study also suggests that the pay gap resulting from clan culture reinforces the conservative impact on the performance, market value, and productivity of family firms in economic sequences. By highlighting the negative effects of clan culture on family business, this research contributes to the literature on corporate governance within a cultural framework.

KEYWORDS

Information institution; clan culture; family firms; internal pay gap; internal trust

1. Introduction

As an influential part of China's private economy, family businesses play an active role in the process of economic transformation. At the same time, they also face severe governance problems. The income distribution policy is constantly changing in today's society, where compensation management arrangement often affects the production efficiency and sustainable development of enterprises (Fang, 2011; Wang & Xiao, 2011; Wei et al., 2022; Xin & Tan, 2009). It is a connotation of responsible corporate governance, and also an goal to promote the process of common prosperity and become a new stage of development. As for family businesses, as relatives are the core of the company's internal governance (Pan et al., 2019b), their compensation arrangements usually involve employee equity and endogenous growth of the enterprise, but there are also problems of employee satisfaction and insufficient internal promotion incentives. Therefore, an effective compensation contract, as a long-term strategic activity of human capital

CONTACT Guangyong Lei  Guangyonglei@126.com  Business School, University of International Business and Economics, No.10 Huixin Dongjie, Chaoyang District, Beijing, China

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investment, is an appropriate means to maintain the durability of family enterprises (Wang & Xu, 2015). In addition, the objective internal pay gap affects the cognition of employees at various levels of family enterprises, which perplex labour relations and promotions at enterprises as well. Consequently, the dynamic adjustment of the pay gap will affect the realisation of responsible corporate governance and the symbiotic relationship between executives and employees.

In recent years, with the market-oriented salary arrangement gradually becoming an increasingly common practice of enterprises, the widening income gap between executives and employees has attracted close attention from the media, the public and the government (Kong et al., 2017). However, due to the low starting point of China's governance level, practitioners have always had doubts about the real value of the widening pay gap (Liang et al., 2019). In this context, we should understand the endogenous factors of compensation governance reflected by family enterprises under the new development pattern, so as to recognise and understand the governance and development problems faced by family enterprises. Simultaneously, unlike developed markets, China's capital market is an emerging market with immature legal system arrangements and implementation. Family enterprises, like other enterprises, are inevitably infiltrated and influenced by various informal institutional arrangements, such as sharing rules and beliefs. This is likely to be reflected in the different compensation contract arrangements of enterprises (Allen et al., 2005; Dimaggio & Powell, 1983; Guiso et al., 2006; North, 1992; Zhu & Chen, 2015). Thus, what informal institutional factors determine the salary structure of family enterprises? How do they affect the corporate governance decisions of family businesses? These are urgent problems that need to be explored and solved.

It is worth noting that in traditional Chinese society, the patriarchal clan is also known as 'family' or 'clan', which is the most basic form of social organisation and also an ethical relationship that follows blood ties (Liang, 1949). Hence, unlike the western society, which relies on the formal urban system as the economic mechanism to protect citizens' cooperation, Chinese family enterprises are modern economic organisations based on clan culture, taking the regional blood contract as the economic, social and survival basis, and infiltrated and influenced by various clan arrangements such as informal institutions such as sharing rules and beliefs. More importantly, as a society with a strong atmosphere of human and ethical relations, China's clan culture occupies an important position in Chinese traditional culture, and replaces the unique trust mode, resource arrangement and cooperation mechanism of the formal institution through customs, ethics and kinship (Chen et al., 2013; Chen et al., 2020; Pan et al., 2019a; Pan et al., 2019b). In essence the family business is usually carried out within the scope of implied blood or marriage relationship, and the clan tends to condense the centripetal force and social trust unique to the blood relationship. This internal trust may become an endogenous factor affecting the different salary levels of the family business. Specifically, the cultural environment can affect the trust preference within the enterprise (Sackmann, 1997). Therefore, we can speculate that clan culture is the driving force that has not been directly observed in shaping the concept and practice of family business compensation.

Compared with other traditional cultures, clan culture reflects the interaction and synergy between family enterprises and the social environment, provides the basis of internal trust, and further determines the scale and number of internal family members participating in senior executives (Pan et al., 2019b). For that reason, we believe that clan

cultural atmosphere affect the wealth distribution behaviour of enterprises, resulting in the following compensation governance characteristics. First, as a social norm, the collectivist concepts of 'differential order pattern' and 'solidarity and mutual benefit' advocated by clan culture often affect the basic motivation of family enterprises' decision-making. In particular, it affects the original motivation of salary structure arrangement (Bertrand & Schoar, 2006). This is mainly due to the blood trust associated with clan culture, which helps to maintain the income of family members, and thus has a decisive impact on the preference of family business compensation structure (Redding & Hsiao, 1990). Second, when a family business is located in an area that has a clan feeling, the clan concept can often lead the business to have a natural compensation preference, thus encouraging family executives to receive higher compensation. Such preferences may also emphasise family values and obligations to family members and loyalty to the family, which is conducive to reducing family differences and promoting the stability of family business control. Third, family enterprises, which are greatly influenced by clan culture, can control the company in the hands of the family directly by providing high salaries for family members, or enjoy the benefits of family control. Therefore, in the environment of a strong clan atmosphere, the salary structure has become a natural institutional arrangement. Under this realistic background, we can speculate that clan culture may have a significant impact on the salary structure of family enterprises. This provides us with an interesting opportunity to investigate whether and how China's unique clan culture affects the pay gap within family businesses.

This paper mainly takes the internal pay gap of family enterprises as a scenario, uses the family tree density of the city where the family enterprises are located to measure clan culture (Guo et al., 2014; Pan et al., 2019a), and investigates the impact of clan culture on the internal pay gap of family enterprises through regression. The baseline regression results show that after controlling for other factors, there is a significant positive correlation between clan culture and the internal pay gap in family enterprises, that is, the regional clan culture atmosphere greatly improves the executive employee pay gap in family enterprises. This result is still robust after considering regression model, variable substitution, omitted variables and endogeneity. We explore the possible impact mechanism and prove that the impact of the pay gap caused by the strong clan culture faced by family enterprises is transmitted through the internal trust mechanism. Further, the grouping results show that the positive correlation between clan culture and internal pay gap in family enterprises is more significant in family enterprises with local executives, executives with the same family name, high degree of family participation, high degree of marketisation, positive economic environment and high degree of opening to the outside world, which indicates that executive governance responsibility and regional development level are significant factors affecting the relationship between clan culture and pay preference. In examining economic consequences, we found that the internal pay gap caused by clan culture did not directly improve enterprise performance, market value, or productivity. This indicates that the governance of the pay gap brought by clan culture is the internalisation of wealth, and the subsequent negative governance results for enterprises.

The contribution of this paper includes three aspects: First, it expands the existing research on family firm governance by exploring the impact of clan culture on the internal pay gap from an informal institutions' perspective. The literature has discussed the impact of informal institutions from the culture of trust, conflict and religion, such as corporate performance (Guiso et al., 2015; Morosini, 1998), venture capital (Bottazzi et al., 2016) and

social responsibility (Debacker et al., 2015; McGuire et al., 2011), etc. However, there is less discussion of the impact of clan culture on family business compensation, which may prevent us from fully and properly understanding the unique role played by traditional culture on the family private economy, and this paper is a further addition to the relevant literature. Secondly, most of the existing studies on internal pay gap give priority to internal factors and external market factors, including macro policies (Bu & Wang, 2014; Chen et al., 2021), industry characteristics (Chen et al., 2006), corporate governance characteristics (Chhaochharia & Grinstein, 2009; Graham et al., 2012; Xu et al., 2021), etc. Few literatures study the role of informal institutions such as culture or religion. From the unique perspective of China's unique clan culture, this paper studies the impact of sociological factors on the internal pay gap, which makes up for the deficiency of previous research on the internal pay gap of enterprises. Finally, this paper also attempts to investigate the specific mechanism of clan culture on the internal pay gap of family enterprises from the perspective of internal trust, which helps to promote an in-depth understanding of the transmission mechanism of internal pay gap, and provides a novel perspective for the study of how clan culture affects the activities of Chinese enterprises.

The rest of this paper is structured in the following order: The second part puts forward the research hypothesis based on the previous theoretical analysis; The third part is sample selection, variable selection and research design; The fourth part is the empirical results and analysis; The fifth part is the further test, and the sixth part is the research conclusion.

2. Literature review

2.1. Economic consequences of clan culture

'A clan is a group of people who come together and gather together' (Bai Hu Tong Yi – Clan). The clan, also known as 'family' or 'clan', is a social group that combines formal and informal hierarchical concepts within the family and follows the proximity of family members to distinguish between the first and the second (Fei, 2012). After thousands of years, clan culture has continued to evolve with the overall changes in Chinese society, and still maintains an unbroken economic connotation, and has become an important factor in social organisation or group relations, one of the main forces determining economic growth and social progress in the soil of Chinese society (Wang et al., 2020; Xu et al., 2020). In the new post-reform and opening-up market economy, Chinese clan life has evolved from rural settlements to cities, not only as a result of the need for clan groups to adapt to their living environment, but also as an inherent demand for economic interests (Zhou, 2016). Meanwhile, clan culture, as an integral part of clan consciousness and practice, defines the marks of different views of interests, rights and obligations by building genealogies, ancestral halls or rituals as clan symbols. The latter forms a set of values, norms, and patterns of ethnic relations unique to each clan group in a written or conventional way, and gradually becomes the traditional culture of 'collectivism' in a certain region.

'Collectivism' is the core content of clan culture (Putnam, 1993), which provides important support for the production activities and living needs of clan members (Greif & Tabellini, 2017; Peng, 2004). On the one hand, in a society based on the regional blood contract, the clan is an important platform for the private economy such as the exchange

of goods and materials, resource allocation, and production cooperation (Greif & Tabellini, 2010); On the other hand, the filial piety and ethics contained in clan education require respect for ancestors and filial piety, harmony and fraternity, thus affecting the psychological distance between people, such as providing a natural basis for social trust within the clans (Chan, 1997; Liang, 1949; Pan et al., 2019b; Peng, 2004). Clan culture, as a social norm shaping the way of organisation or group, aims at 'solidarity and mutual benefit', condenses the emotional identity of members with common values and concepts, so as to coordinate the interests, rights and obligations among members, mobilise social forces inside and outside the ethnic group and organise mutual assistance and cooperation (Hsu, 1963, Fei, 2012; Zhang, 2020). According to the social network theory, any organisation and individual are embedded in a certain social relationship with the outside world, so clan culture provides a wide range of psychological and social environmental support for the organisation and individual behaviour, which is indispensable for the internal governance of the organisation (Uzzi, 1996). In particular, in the process of clan members' activities, the relationship connection can build a multi intersecting pan clan organisation, provide a social market other than personal product transactions, so as to enhance the mutual trust of members in the network structure and reduce the cost of exchanging or sharing information related to the organisation, which has an obvious trend of organisational interaction.

The research on the economic consequences of clan tradition at the enterprise level can be divided into two categories: Taking the enterprise as a whole in the same region as the research object, analysing and discussing the influence of clan tradition on the quantity and quality of Regional Entrepreneurial Enterprises; Taking micro individuals of enterprises as the research object, this paper analyzes and discusses the influence of regional clan tradition on enterprise behaviour. Although the research on clan culture and corporate behaviour has increased significantly, it mainly focuses on the analysis of the governance and influence mechanism of clan culture, and less attention has been paid to the analysis of wealth distribution. However, clan culture is regarded as infiltrating all organisational fields of social networks (Chiaburu et al., 2014; Grant, 2008), which can directly or indirectly affect the internal governance effect of enterprises. Therefore, in this process, clan culture, as the traditional informal institution, will continue to affect the internal wealth distribution decision of family enterprises, and then affect internal pay gap, which provides some evidence support for the hypothesis of this study.

2.2. Hypothesis development

Hofstede (1980) indicated that culture is a common planning of the way of thinking that distinguishes members of the same society from other members of society. This means that values are the key aspect of a culture. Social and cultural values affect the behaviour of all individuals and are transmitted through social interaction (Ackermann & Angus, 2014). In China, family enterprises, as a special form of enterprise organisation with clan culture as the core, still exist in contemporary society. They have a unique trust relationship, that is, the smooth implementation of corporate policies is usually guaranteed by informal norms such as clan relations and moral customs (Li, 2003). According to the 'structural hole' theory of social networks, family members can have direct contact with any member in the enterprise, while other non-family members cannot have direct

contact (Burt, 1992). What's more, the relationship between members who do not have contact breaks, forming a 'structural hole' in the social network structure, and family members with 'structural holes' play an important role in the network connection. It has advantages in family business information and resources.

Different from non-family enterprises, as an economic and social organisation, the core characteristics of family enterprises focus on kinship and clan network, have strong motivation to maintain family control and interests, and senior positions are usually held by family members (Huang et al., 2020). At the same time, the unique trust relationship has a potential impact on the culture of the family business. The owners usually regard the family business as an asset, which can maintain lasting control to continue a certain family honour and social status. Specifically, as an important part of modern corporate governance, compensation decision-making is a non-negligible mechanism to ensure strong family cohesion. To realise family interests, family enterprises must control the compensation structure to show the natural closeness and trustworthiness of blood ties in this family organisation (Carney, 2005; Lee, 2004). In companies with stronger clan cultural atmosphere, more family members will participate in management, showing a unique core of corporate governance. However, the kinship governance mode of clan culture is beneficial to the internal ethnic group members and excludes the external non-ethnic group members (Wang et al., 2020). Thus, as an informal institution, strong clan culture in areas places a greater emphasis on the social networks built by blood to organise family members' cooperation and resource allocation, placing a high level of importance on trust between them.

On the one hand, a significant feature of clan culture is the formation of trust based on 'differential order pattern'. In other words, the clan is based on the principle of trust between group members but exclusion from outsiders. For family businesses, the proportion of family control is relatively concentrated. Owners can directly obtain utility by holding the company in the hands of the family, and can introduce more family managers, which will affect the distribution of compensation and benefits to a greater extent (Cheng et al., 2021). As the scale of the clan expands, more relatives participate, the blood and emotional ties between members become stronger, and trust in the enterprise grows. Consequently, an individual's internal self-interest tends to become long-term, causing them to deviate from the goal of maximising the company's wealth and seriously harm other stakeholders. The 'collectivism' formed by this internal trust makes the family have stronger control over the board of directors and management (Pan et al., 2019b), which further affects the decision-making of the board of directors in formulating the compensation contract. It may choose to concentrate profits on the family itself. This could improve the compensation level for relatives, reduce the compensation level of non-relatives, and finally expand the compensation gap between executives and employees in the enterprise (Eddleston & Kellermanns, 2007; Mann, 1980). Therefore, strong clan culture atmosphere can promote the formation of internal pay gap.

On the other hand, in family enterprises with the core of clan culture and blood trust, the concept of 'solidarity and reciprocity' between relatives may also be closely related to different salary levels. Historically, this kind of sharing and allocating resources has a long tradition of clan tradition. The clan strictly prohibits the sale of common property. Even if it is private property, the owner must first find a buyer within the clan. Guo et al. (2013) found that this cultural norm helps

to promote the concentration of financial resources within the clan, so the resources allocated to outsiders will be reduced. At the same time, family traditions in clan culture emphasise the collective emotional preferences of relatives, clarify the responsibilities and moral obligations of relatives, and urge relatives to help enterprises obtain various resources, thus reducing business uncertainty (Mcevely et al., 2003). Specifically, in enterprises, family members will take the initiative to hold corporate positions, and family enterprises will also be willing to give higher salary levels to family executives. This practice of giving higher salaries to relatives' executives aims to promote the formation of an internal cooperation atmosphere, make family executives more willing to take the initiative to find problems in the enterprise (Sirmon & Hitt, 2003), and is conducive to the stability of family relations, so as to maintain a unified family values and cognition of the enterprise (Williamson et al., 1993).

Based on the above analysis, the clan network formed by the aggregation of clan culture has formed a 'structural hole', and the trust preference generated by the structural hole emphasises the values of 'collectivism' and 'solidarity and mutual benefit' of clan members, which can affect the corporate governance concept and further affect the salary structure of enterprises. Therefore, we propose the following research hypotheses:

H1: After controlling other factors, clan culture is significantly and positively related to the intra-firm pay gap, that is, the stronger the regional clan atmosphere, the greater the pay gap within family firms.

3. Research design

3.1. Sample and data

We take A-share family listed firms in Shanghai and Shenzhen stock exchanges as our initial sample. Considering that the China Securities Regulatory Commission issued the Standards for the Disclosure of Firm Financial Reports in 2005, which stipulates that listed firms are obliged to disclose the remuneration of management, our sample period is from 2005 to 2020. Referring to Anderson and Reeb (2003), Burkart et al. (2003) and Xu et al. (2019), we define family firms using the following criteria: (1) the ultimate control right of the firm can be traced back to a natural person or a family connected by blood and marriage; (2) The natural person or family of the firm is the largest shareholder of the listed firm directly or indirectly; (3) At least two or more family members hold shares or hold positions in the listed firm or affiliated firm. We obtain the basic information of family listed firms from CNRDS database. The financial data are from the CSMAR and WIND databases. The data about resident population and GDP growth rate are from CEIC database.

By screening the sample, we exclude: (1) firms from the financial and insurance industries, (2) samples with omitted values and abnormal data for each control variable. Applying the above selection criteria yields a final sample of 10,799 firm-year observations. All continuous variables are winsorised at the top and bottom 1%.

3.2. Empirical model and variable selection

We construct model (1) to test the relationship between clan culture and internal pay gap in family firms. If our hypothesis is true, the δ_1 should be significantly positive.

$$GAP_{i,t} = \delta_0 + \delta_1 \times CLAN_i + CONTROLS + INDUSTRY + YEAR + \varepsilon_{i,t} \quad (1)$$

3.2.1. The variables involved in the model (1) are described as follows

3.2.1.1. Clan culture (CLAN). Clan culture is defined as the genealogical density of the region where the family firms are located. The genealogical data comes from the 'Chinese genealogy knowledge service platform' of Shanghai Library, which includes all the genealogical data information. Following Pan et al. (2019a), we use the genealogy density of the region where the family firm is located to measure clan culture. Compiling the genealogy is one of the important activities of the clan. The genealogy is an important cultural and emotional memory carrier of the clan organisation. In other words, the genealogy can achieve the purpose of cohesion and harmony among the people through social functions such as respecting ancestors and ancestors, paying attention to the sense of unity of clan members, and emphasising the equal relationship within the clan. At the same time, it also plays a guiding role in the formation of contemporary social order and habits (Zheng, 2016). In addition, the advantages of using the data of the Chinese genealogy knowledge service platform are as follows. First, it contains most of the genealogy data from all over the country, with comprehensive coverage and low collection cost. Second, the geographical information and compilation year of the genealogy are accurate, and each genealogy has a region year mark, which is convenient for matching with the local family firms. Therefore, we believe that the genealogy data of the 'Chinese genealogy knowledge service platform' is an ideal data source for proxying regional clan culture. It should be pointed out that we use the genealogy data from the Ming Dynasty to 1990. We use the number of genealogies per million people as a measure of clan culture of the place where the firm is located.

3.2.1.2. Internal pay gap (GAP). Referring to Liang et al. (2019), internal pay gap (GAP) is defined as the natural logarithm of the ratio of the average pay of executives to the average pay of employees. Referring to Bu and Wang (2014), the definition of average senior executive compensation and average employee compensation is as follows:

Average compensation of senior executives (MANC) = total annual remuneration of directors and supervisors / (number of senior executives + number of supervisors + number of directors – number of independent directors – number of directors and supervisors without remuneration)

Average employee compensation (EMPC) = (employee compensation payable at the end of the period – employee compensation payable at the end of the previous period + cash paid to and for employees – total annual pay of directors, supervisors and senior executives) / (number of employees – number of directors, supervisors and senior executives).

3.2.1.3. Control variables. Following previous literature, we use the following control variables in model (1): financial leverage (LEV), firm performance (ROA), firm size (SIZE) and cash holding (CASH), firm age (LIST), the shareholding ratio of the largest shareholder (TOP1), the size of the board of directors (BOARD), the proportion of independent directors (INDEP), duality (DUAL), and the number of important non-local subsidiaries (SUBIRM). The macroeconomic development in regions may also affect internal pay gap, we control the regional macroeconomic environment (GDPGRO). In addition, Zhang and Ma (2017) show that ethnic minorities have an important impact on clan culture. We add a dummy variable of whether the location of the firm is a minority settlement or not (MINORITY) as a control variable. Finally, we add industry fixed effects and year fixed effects (INDUSTRY, YEAR) in the regression model. See Table 1 for the detailed definition of the above variables.

3.3. Descriptive statistics

Table 2 reports the distribution of the number of genealogies in different provinces of China. Figure 1 shows the sample distribution of China's city genealogy density. The city of our final sample accounts for more than 50% of China's land area. The results show that most of the regions with high clan culture are located in East and South China, but are relatively weak in northern and western minority areas of China.

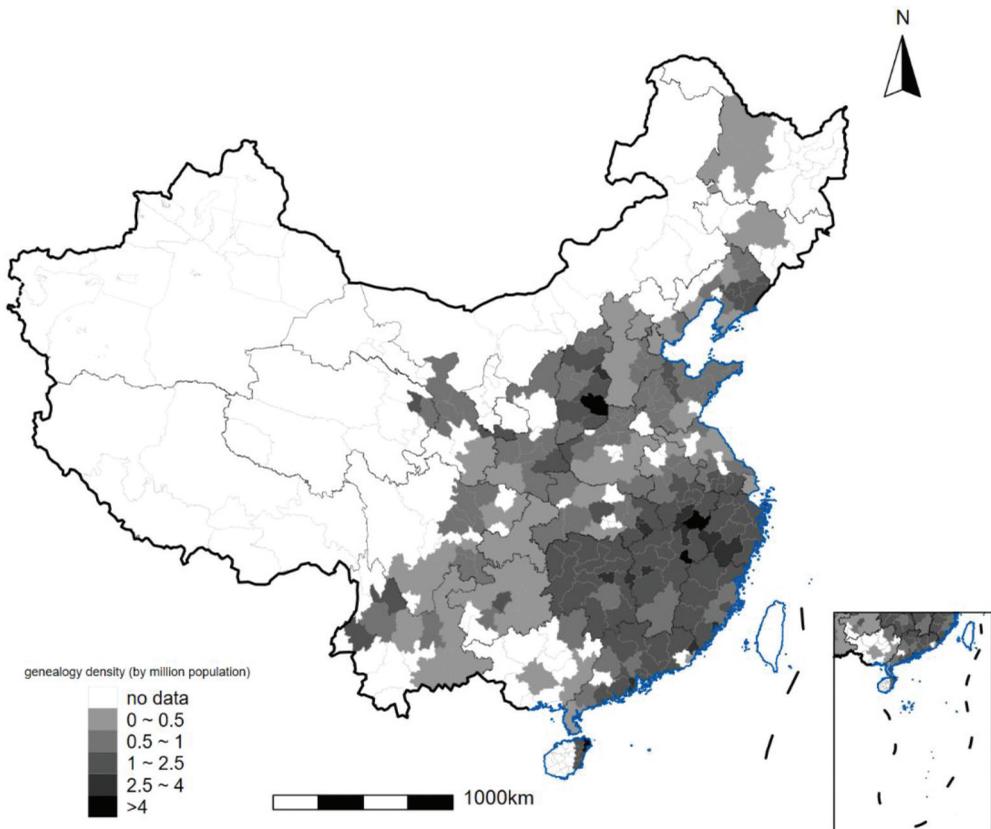
Table 3 shows that the mean value of GAP is 1.316 and the median is 1.280. The minimum, maximum and standard deviation of GAP are 0.010, 3.010 and 0.582 respectively, which indicates that there are big differences in the internal pay gap of family firms. The mean value of CLAN is 1.235, the median value is 1.095, the minimum value, the

Table 1. Variable definitions.

Variable	Variable definition
GAP	Executive employee pay gap, $\ln(\text{MANC}/\text{EMPC})$, that is, the natural logarithm of the ratio of the average executive pay to the average employee pay.
MANC	Total annual pay of directors, supervisors and senior executives/(number of senior executives + number of supervisors + number of directors - number of independent directors - number of directors, supervisors and senior executives without remuneration).
EMPC	(Employee pay payable at the end of the period - employee pay payable at the end of the previous period + cash paid for employees - total annual pay of directors and supervisors)/(number of employees - number of senior executives - number of supervisors - number of directors).
CLAN	The number of genealogies per million people (logarithm) of the place where the firm is located.
LEV	The ratio of total liabilities to total assets at the end of the year.
ROA	The ratio of profit to total assets.
SIZE	The natural logarithm of total assets at the end of the year.
CASH	The ratio of net cash flow from operating activities to total assets at the end of the year.
TOP1	The shareholding ratio of the largest shareholder.
LIST	The natural logarithm of the age of the firm from listing.
BOARD	The natural logarithm of the number of directors.
INDEX	The ratio of the number of independent directors to the number of directors.
DUAL	A dummy variable with the value of 1 if the chairman and manager are the same person, otherwise take 0.
SUBIRM	The natural logarithm of the number of subsidiaries in different provinces of the parent firm holding 50% or more shares.
GDPGRO	GDP growth rate.
MINOR	A dummy variable with a value of 1 if the location of the firm is a minority settlement, otherwise 0.
INDUSTRY	Industry fixed effect.
YEAR	Year fixed effect.

Table 2. Total number of genealogies in sample provinces.

Province	Number of genealogies	Province	Number of genealogies
Zhejiang	12689	Chongqing	150
Hunan	9207	Shaanxi	144
Jiangsu	4154	Guangxi	98
Jiangxi	3708	Yunnan	84
Hubei	2823	Gansu	43
Anhui	2542	Guizhou	43
Fujian	1401	Tianjin	40
Guangdong	1305	Hainan	39
Shandong	934	Beijing	34
Sichuan	564	Jilin	19
Henan	530	Heilongjiang	16
Shanghai	391	Qinghai	9
Liaoning	266	Inner Mongolia Autonomous Region	5
Shanxi	198	Tibet	1
Hebei	188		

**Figure 1.** Distribution of genealogies in sample cities.

maximum value, and the standard deviation are 0.000, 4.604, and 0.782, respectively, that is, there are 1.235 genealogies per million people on average. Figure 2 shows the fitting curve between clan culture and pay gap within the family firm. We can see that firms in clan cultural areas have higher internal pay gaps, which is consistent with our intuition.

Table 3. Descriptive statistics of main variables.

Variable	N	Mean	SD	Min	P25	Median	P75	Max
GAP	10799	1.316	0.582	0.001	0.914	1.280	1.679	3.010
CLAN	10799	1.235	0.782	0.000	0.555	1.095	1.725	4.604
LEV	10799	0.415	0.220	0.048	0.245	0.401	0.553	1.545
ROA	10799	0.034	0.086	-0.511	0.015	0.040	0.070	0.216
SIZE	10799	21.802	1.101	18.927	21.035	21.700	22.470	24.988
CASH	10799	0.047	0.073	-0.216	0.008	0.046	0.089	0.261
TOP1	10799	0.339	0.141	0.029	0.232	0.319	0.427	0.900
LIST	10799	1.671	0.889	0.000	1.099	1.792	2.303	3.332
BOARD	10799	2.088	0.191	1.386	1.946	2.197	2.197	2.890
INDEX	10799	0.377	0.054	0.143	0.333	0.364	0.429	0.750
DUAL	10799	0.357	0.479	0.000	0.000	0.000	1.000	1.000
SUBIRM	10799	2.388	0.932	0.000	1.792	2.303	2.944	6.851
GDPGRO	10799	0.075	0.121	-0.766	0.046	0.073	0.101	4.934
MINOR	10799	0.008	0.089	0.000	0.000	0.000	0.000	1.000

Table 4 shows correlation coefficient analysis. As we can see, there is a significant positive correlation between clan culture and the internal pay gap of family firms, which preliminarily verifies our hypothesis. At the same time, except that the correlation coefficient between SUBFIRM and SIZE is greater than 0.6, the correlation coefficient between other variables is not more than 0.5. The maximum value of the variance expansion factor (VIF) is 1.98, which is less than 2, indicating that there is no serious collinearity problem.

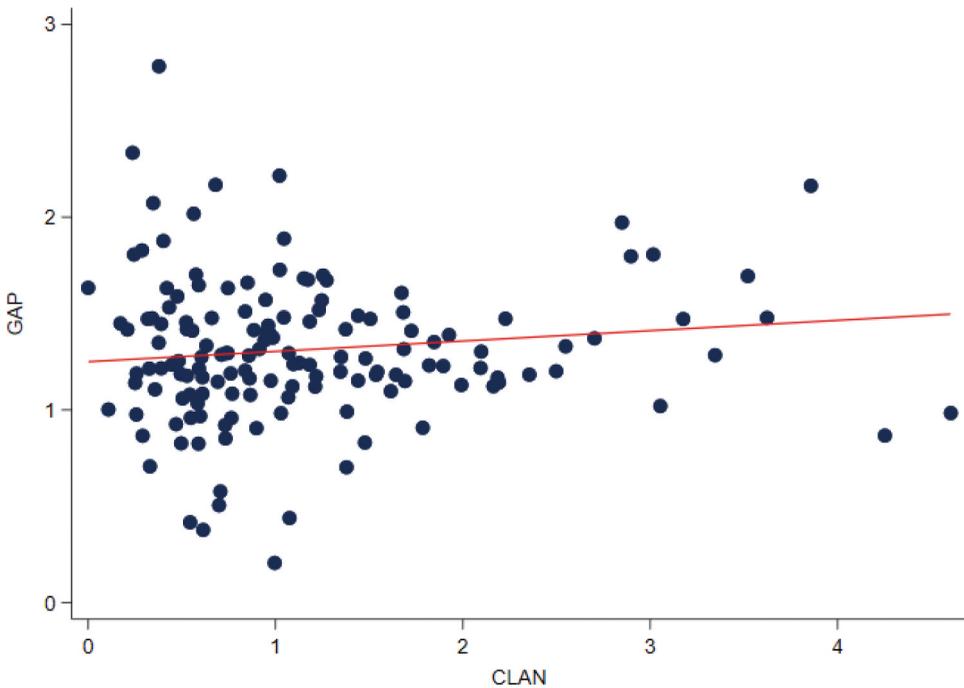


Figure 2. Scatter diagram of clan culture and internal pay gap.

4. Empirical results

4.1. Baseline results

Table 5 reports the baseline results of the relationship between clan culture and internal pay gap. Column (1) shows the regression results after only controlling the year fixed effects and industry fixed effects. It shows that the coefficient of CLAN is 0.049, which is significant at the level of 1%. Column (2) further controls the financial characteristic variables based on column (1). Column (3) further controls the impact of corporate governance on internal pay gap. As we can see, the regression coefficient of CLAN is still significantly positive at the 1% level, which indicates that our baseline results are stable. In summary, the above results support our hypothesis, that is, the stronger the regional clan culture, the greater the internal pay gap of family firms in the local region.

4.2. Robustness test

4.2.1. Alternative regression methods

In order to test the rationality of the regression method in this paper, we use a series of alternative regression methods to investigate the reliability of the conclusion. First, considering the continuous changes in the internal and external environment, as well as the impact of the global financial crisis and Sino-US trade frictions and other events, we add the interaction term of Industry * Year in model (1) to control these impacts. Second, in order to control the potential heteroscedasticity and sequence correlation, and the impact of factors that may not change over time that may be omitted at the firm level on our results, we further use the standard errors of the estimates obtained by clustering at the firm level and control the fixed effect of the firm in columns (2) and (3) to improve the model (1). Third, we pay attention to the truncation of the data distribution of the pay gap, and we use Tobit model to conduct regression analysis again. The regression results from columns (1) to (4) show that, even if the regression method is changed, CLAN and GAP are significantly positively correlated at the level of 1%, and our conclusion has not changed substantially.

4.2.2. Alternative measures of key variables

Our conclusions may be affected by the measurement error of key variables, so we replace the measurement of key variables. First, in column (1) of Table 7, we use absolute pay gap (GAP2)¹ to measure internal pay gap. Second, Feng and Chang (2009) believe that China's clan culture is strengthened during the Qing Dynasty. In column (2), we use the family tree density (MCLAN)² from the Qing Dynasty to 1990 to measure clan culture. Third, Cheng et al. (2021) point out that ancestral halls have an important impact on clan cohesion and member values. Therefore, we use the number of ancestral halls in the city (CTCLAN)³ to measure clan

¹GAP2 = $\ln(\text{MANC-EMPC})$, that is, the natural logarithm of the difference between the average salary of executives and the average salary of employees.

²MCLAN = the number of genealogy from the Qing Dynasty to 1990/the number of population in 1990 (million).

³CTCLAN = number of ancestral halls where the enterprise is located/1990 population (million). In our study, the data of ancestral halls in various prefecture-level cities are captured through the keywords of 'clan temple' (宗庙), 'branch temple' (支庙), 'family temple' (家庙), 'gong temple' (公庙), 'clan halls' (宗祠), 'branch halls' (支祠), 'family halls' (家祠), 'gong halls' (公祠) and 'ancestral halls' (祠堂) (access address: <https://lbs.amap.com/api>, download time: 3 June 2019).

Table 4. Correlation coefficient matrix.

Variable	GAP	CLAN	LEV	ROA	SIZE	CASH	TOP1	LIST	BOARD	INDEX	DUAL	SUBIRM	GDPGRO	MINOR
GAP	1													
CLAN	0.0721***	1												
LEV	0.1128***	0.0010	1											
ROA	0.1097***	0.0013	-0.3797***	1										
SIZE	0.3729***	-0.0220**	0.2912***	0.0821***	1									
CASH	0.1148***	0.0210*	-0.1671***	0.3096***	0.0262***	1								
TOP1	0.0476***	0.0062	-0.0394***	0.1740***	0.0651***	0.0841***	1							
LIST	0.1042***	-0.0669***	0.3241***	-0.1797***	0.3399***	-0.0158	-0.2365***	1						
BOARD	0.0733***	-0.0580***	0.0627***	0.0560***	0.1097***	0.0192**	-0.0404***	0.0325***	1					
INDEX	-0.0017	0.0896***	-0.0301***	-0.0101	-0.0229**	0.0062	0.0498***	-0.0384***	-0.5931***	1				
DUAL	-0.0988***	0.0747***	-0.0743***	0.0199**	-0.0713***	-0.0101	0.0667***	-0.1522***	-0.1227***	-0.6790***	1			
SUBIRM	0.2611***	-0.0293***	0.3145***	-0.0549***	0.6560***	-0.0189*	-0.0491***	0.3702***	0.0421***	-0.0082	-0.0313***	1		
GDPGRO	0.0049	-0.0452***	0.0276***	0.0298***	-0.0724***	-0.0265***	0.0366***	-0.0218**	0.0539***	-0.0366***	-0.0298***	-0.0564***	1	
MINOR	-0.0150	-0.0877***	-0.0132	-0.0170*	-0.0336***	-0.0074	-0.0106	0.0179*	-0.0266***	-0.0037	0.0171*	-0.0195**	0.0013	1

Pearson correlation coefficient is below, and the Spearman correlation coefficient is above. *, **, *** respectively represent significant at 10%, 5% and 1% levels.

Table 5. The impact of clan culture on internal pay gap.

Variable	GAP		
	(1)	(2)	(3)
CLAN	0.049*** (6.84)	0.055*** (8.58)	0.055*** (8.56)
LEV		0.003 (0.09)	-0.004 (-0.11)
ROA		0.247*** (3.42)	0.267*** (3.64)
SIZE		0.224*** (36.43)	0.200*** (25.92)
CASH		0.673*** (8.50)	0.682*** (8.64)
TOP1			-0.076* (-1.88)
LIST			-0.027*** (-3.88)
BOARD			0.021 (0.63)
INDEND			0.384*** (3.31)
DUAL			-0.085*** (-8.17)
SUBIRM			0.053*** (6.56)
GDPGRO			0.016 (0.25)
MINOR			0.083 (1.61)
CONSTANT	1.256*** (117.89)	-3.667*** (-28.52)	-3.364*** (-19.42)
INDUSTRY	Yes	Yes	Yes
YEAR	Yes	Yes	Yes
N	10799	10799	10799
Adj.R ²	0.052	0.213	0.221

Table 5 presents the results for the impact of local clan culture of the city in which a firm located on internal pay gap. Standard errors of the estimates are adjusted by White heteroscedasticity. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

culture in column (3). Fourth, due to the cultural phenomenon of 'son preference' in Chinese clan tradition (Greenhalgh, 1985; Wu, 2012), we further use the gender ratio (Boy to Girl)⁴ in column (4) to measure clan culture. The results of columns (1) to (4) in Table 7 show that the coefficients of clan culture are significantly positive, which indicates that our conclusion remains unchanged after replacing the measurement of key variables.

4.2.3. Alternative samples

In order to further ensure the consistency and reliability of the conclusions, we also analyse whether the model estimation in this paper is sensitive to different samples.

Table 8 shows the regression results of alternative sample. First, to prevent the baseline conclusion from being affected by the abnormal value of clan culture, we delete the sample with the family genealogy density of 0 in column (1). In column (2), we eliminate samples whose clan culture variable is in the top or bottom 5%. Second, we check the robustness of the research conclusion for different geographical alternative samples.

⁴We use the ratio of the number of men and women aged 0–9 in the 2000 national population census.

Table 6. Alternative regression methods.

Variable	GAP			
	(1)	(2)	(3)	(4)
CLAN	0.056*** (8.57)	0.055*** (3.91)	0.174*** (3.46)	0.055*** (8.58)
LEV	-0.004 (-0.15)	-0.004 (-0.07)	0.028 (0.63)	-0.004 (-0.11)
ROA	0.273*** (3.66)	0.267*** (2.97)	0.151** (2.08)	0.267*** (3.65)
SIZE	0.201*** (25.92)	0.200*** (11.43)	0.143*** (11.36)	0.200*** (25.98)
CASH	0.680*** (8.45)	0.682*** (6.01)	0.053 (0.74)	0.682*** (8.66)
TOP1	-0.079* (-1.93)	-0.076 (-0.85)	0.113 (1.45)	-0.076* (-1.88)
LIST	-0.027*** (-3.86)	-0.027* (-1.93)	-0.074*** (-5.31)	-0.027*** (-3.89)
BOARD	0.015 (0.43)	0.021 (0.31)	-0.135*** (-2.79)	0.021 (0.63)
INDEND	0.385*** (3.26)	0.384* (1.78)	0.660*** (4.31)	0.384*** (3.31)
DUAL	-0.087*** (-8.26)	-0.085*** (-4.39)	-0.043*** (-3.36)	-0.085*** (-8.19)
SUBIRM	0.053*** (6.51)	0.053*** (3.11)	0.050*** (3.78)	0.053*** (6.57)
GDPGRO	0.022 (0.36)	0.016 (0.24)	-0.020 (-0.33)	0.016 (0.25)
MINOR	0.072 (1.36)	0.083 (0.74)		0.083 (1.62)
CONSTANT	-3.377*** (-19.24)	-3.364*** (-8.69)	-2.015*** (-6.83)	-3.365*** (-18.25)
INDUSTRY	Yes	Yes	No	Yes
YEAR	Yes	Yes	Yes	Yes
INDUSTRY*YEAR	Yes	No	No	No
FIRM	No	No	Yes	No
N	10799	10799	10799	10799
Adj.R ² /Pseudo R ²	0.220	0.221	0.624	0.145

Table 6 reports the regression results after optimising the regression model. Column (1) adds the interaction term of Industry * Year. Column (2) is the regression result based on the standard errors of estimates clustering at the firm level. Column (3) controls the firm fixed effect. Column (4) is the regression result based on Tobit model. Except for column (2), columns (1), (3) and (4) are regression results based on standard errors adjusted by white heteroscedasticity. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

Clans were less concentrated in metropolitan areas in history. Moreover, provincial capital cities or first-tier cities, as leaders of economically developed regions, are the centres of China's strong attraction to the establishment of companies and population migration. Our baseline result may be driven by the impact of companies located in large cities or foreign populations. Therefore, in order to mitigate the impact of large-scale migration of large cities and population across provinces on clan culture, we exclude firms located in provincial capital cities⁵ and first-tier cities⁶ from columns (3) and (4).

To sum up, it can be seen that in alternative samples, the coefficients of CLAN are always positive, consistent with the baseline regression results. In general, no matter which sample is used, the estimated coefficient of the result CLAN in **Table 8** is always

⁵Provincial capital cities include: Chengdu, Fuzhou, Guangzhou, Guiyang, Harbin, Haikou, Hangzhou, Hefei, Hohhot, Jinan, Kunming, Lhasa, Lanzhou, Nanchang, Nanjing, Nanning, Shenyang, Shijiazhuang, Taiyuan, Urumqi, Wuhan, Xi'an, Xining, Yinchuan, Changchun, Changsha and Zhengzhou.

⁶First-tier cities: Beijing, Shanghai, Guangzhou, and Shenzhen.

Table 7. Alternative measures of key variables.

Variable	GAP2		GAP	
	(1)	(2)	(3)	(4)
CLAN	0.055*** (8.56)			
MCLAN		0.056*** (8.61)		
CTLAN			0.064*** (13.00)	
BOY TO GIRL				0.505*** (9.85)
LEV	-0.004 (-0.11)	-0.004 (-0.12)	0.002 (0.08)	-0.010 (-0.32)
ROA	0.267*** (3.64)	0.267*** (3.64)	0.269*** (3.65)	0.300*** (3.96)
SIZE	0.200*** (25.92)	0.200*** (25.93)	0.208*** (26.76)	0.196*** (23.72)
CASH	0.682*** (8.64)	0.681*** (8.63)	0.677*** (8.55)	0.795*** (9.38)
TOP1	-0.076* (-1.88)	-0.076* (-1.88)	-0.082** (-2.04)	-0.096** (-2.19)
LIST	-0.027*** (-3.88)	-0.027*** (-3.88)	-0.031*** (-4.45)	-0.025*** (-3.32)
BOARD	0.021 (0.63)	0.021 (0.63)	0.014 (0.42)	-0.016 (-0.44)
INDEND	0.384*** (3.31)	0.383*** (3.30)	0.338*** (2.90)	0.373*** (2.95)
DUAL	-0.085*** (-8.17)	-0.085*** (-8.17)	-0.088*** (-8.42)	-0.092*** (-8.16)
SUBIRM	0.053*** (6.56)	0.053*** (6.55)	0.044*** (5.46)	0.037*** (4.30)
GDPGRO	0.016 (0.25)	0.016 (0.25)	0.034 (0.52)	0.010 (0.15)
MINOR	0.083 (1.61)	0.083 (1.62)	0.070 (1.32)	-0.010 (-0.19)
CONSTANT	-3.364*** (-19.42)	-3.365*** (-19.43)	-3.486*** (-19.93)	-3.656*** (-18.54)
INDUSTRY	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes
N	10799	10799	10579	9194
Adj.R ²	0.221	0.221	0.230	0.206

Table 7 shows the regression results of alternative measures of key variables. Standard errors of the estimates are adjusted by White heteroscedasticity. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

positive and significant at least at the 1% level, which is very consistent with the baseline result presented in column (3) of Table 1.

4.2.4. Omitted variable bias

We need to pay attention to the omitted variables when studying clan culture and the internal pay gap of family firms. First, we add other control variables that may be ignored in the baseline regression results. Existing literature shows that religious belief, Confucian culture and business culture can also affect corporate governance (Pan, Weng, et al., 2019b). Therefore, we add three control variables, namely religious belief (RELIGION), Confucian culture (CONFUCIAN) and business group culture (GROUP), to the baseline results. Panel A in Table 9 shows that after controlling the influence of other cultures, the influence of clan culture on internal pay gap is still robust.

Table 8. Alternative samples.

Variable	GAP			
	(1)	(2)	(3)	(4)
CLAN	0.060*** (9.21)	0.076*** (8.70)	0.047*** (4.73)	0.029*** (3.64)
LEV	-0.015 (-0.49)	-0.027 (-0.81)	-0.110** (-2.05)	-0.042 (-1.19)
ROA	0.254*** (3.47)	0.307*** (3.96)	0.526*** (3.88)	0.235*** (2.80)
SIZE	0.199*** (25.76)	0.203*** (24.60)	0.355*** (28.90)	0.193*** (21.08)
CASH	0.655*** (8.28)	0.657*** (7.70)	1.292*** (9.96)	0.709*** (7.71)
TOP1	-0.085** (-2.12)	-0.137*** (-3.15)	-0.185*** (-2.91)	-0.033 (-0.70)
LIST	-0.031*** (-4.43)	-0.027*** (-3.62)	-0.080*** (-6.75)	-0.016* (-1.93)
BOARD	0.022 (0.64)	0.018 (0.49)	0.077 (1.45)	0.031 (0.76)
INDEND	0.411*** (3.54)	0.387*** (3.11)	0.784*** (4.39)	0.274* (1.91)
DUAL	-0.083*** (-7.96)	-0.087*** (-7.70)	-0.128*** (-7.46)	-0.096*** (-7.88)
SUBIRM	0.058*** (7.24)	0.049*** (5.77)	0.117*** (8.95)	0.034*** (3.71)
GDPGRO	0.025 (0.39)	0.069 (1.01)	-0.085 (-0.80)	0.028 (0.43)
MINOR	0.091* (1.72)	0.181*** (2.97)	0.119* (1.76)	0.059 (1.15)
CONSTANT	-3.364*** (-19.37)	-3.425*** (-18.30)	3.914*** (14.51)	-3.133*** (-14.97)
INDUSTRY	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes
N	10726	9193	8323	8165
Adj.r ²	0.223	0.220	0.388	0.189

Table 8 shows the regression results of subsample test. Column (1) deleted the samples of prefecture level cities with 0 genealogical density. Column (2) deleted the top and bottom 5% of the observed values of the genealogical density distribution. Column (3) does not include provincial capital cities, and column (4) does not include first tier cities. The values in brackets are t-values adjusted by white heteroscedasticity. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

Second, in order to further test the bias caused by omitted variables, we define two variables, including δ and R_{\max} . δ which indicates the relative selection degree of observable variables and unobservable variables. R_{\max} is the maximum goodness of fit of the equation. Theoretically, R_{\max} should be equal to 1, if we control all variables. In principle, the estimation coefficient and R^2 usually move together. If the coefficient change is always accompanied by a large R^2 change, the stability of the estimated coefficient is better. To alleviate the problem of omitted variable bias, we set up the following three regression models and named them benchmark model (2), partial control variables model (3) and full control variables model (4):

$$GAP_{i,t} = \beta_0 + \beta_1^0 \times CLAN_i + \varepsilon_{i,t} \quad (2)$$

$$GAP_{i,t} = \beta_0 + \tilde{\beta}_1 \times CLAN_i + \beta_2 \times CONTROLS1 + \varepsilon_{i,t} \quad (3)$$

Table 9. Omitted variable bias test.

Panel A	GAP		
Variable	(1)	(2)	
CLAN	0.030*** (3.72)	0.036*** (4.96)	
REGION	-0.000 (-0.11)	-0.001 (-1.26)	
CONFUCIAN	0.000 (1.16)	-0.000 (-0.12)	
GROUP	0.005*** (5.73)	0.004*** (5.49)	
CONTROL VARIABLE	No	Yes	
INDUSTRY	Yes	Yes	
YEAR	Yes	Yes	
N	10016	10016	
Adj.R ²	0.050	0.222	
Panel B Oster (2019) test GAP			
Uncontrolled (1)	Control (2)	Beta(Rmax = 1.3*r control, δ = 1) (3)	Delta(Rmax = 1.3*r control, β = 0) (4)
0.0487 (0.0071) [0.0524]	0.0553 (0.0065) [0.2214]	0.5789	19.3188

In panel A and panel B of Table 9, Columns (1) – (2) report the estimated coefficients of CLAN without and with all control variables, respectively. The value in brackets in the column of panel A is the t-value adjusted by white heteroscedasticity. Standard errors are reported in brackets in Columns (1) - (2) of panel B, and adj.r² is reported in square brackets; Columns (3) – (4) respectively report the deviation adjustment coefficient and relative selection degree using the adjustment strategy proposed by Oster (2019).

$$GAP_{i,t} = \beta_0 + \beta_1^* \times CLAN_i + \beta_2 \times CONTROLS + \beta_3 \times CONTROLS2 + \varepsilon_{i,t} \quad (4)$$

where CLAN represents the core variable to be evaluated, namely clan culture. CONTROLS1 is the same as the control variables in the model (1). CONTROLS2 represents the vector set of unobservable variables. We assume that CONTROLS1 and CONTROLS2 are orthogonal. β_1^0 is the estimated coefficient of CLAN in the benchmark equation, and its goodness of fit is R_0 . $\tilde{\beta}_1$ is the estimated coefficient of the CLAN of the control equation, and its goodness of fit is R^* . β_1^* is the estimated coefficient of the CLAN in full control variables equation, and its goodness of fit is R_{\max} , which should be equal to 1 theoretically.

On the basis of the above three regression models, the selection balance degree of observable and unobservable variables is further defined δ , and expressed as $\delta * COV(CONTROLS1, CLAN)/VAR(W1) = COV(CONTROLS2, CLAN)/VAR(CONTROLS2)$. Oster (2019) believes that there are two methods to test the robustness of random experiment results. The first method is to assume that R_{\max} is a certain value (usually this value is less than or equal to 1) and calculate the selection balance based on $\beta = 0$. The second method is to set δ When the value range does not include 0, the coefficient estimation result will be robust. Under the setting of the second method, β_1^* is a robust estimator whose value range can be expressed as $\beta_1^* \in [\tilde{\beta}_1, \beta_1^*(R_{\max}, 1)]$.

We choose the following two ways to test. The research results of Column (1) – Column (4) in panel B show that (1) when $\beta = 0$ and $R_{\max} = 1.3 R$, the absolute values of δ are more than 1; (2) When $\delta = 1$ and $R_{\max} = 1.3 R$, the value range of β^* does not include 0 which is estimated by the coefficient of endogenous variables. Our results indicate that the above methods have passed the test, so there is no problem of regression bias caused by omitted variables in this study, and the baseline regression result is robust.

4.2.5. Instrumental variables (IV-2SLS)

To reduce the impact of other unobservable factors on our regression results, we use the instrumental variable (IV-2SLS) method to re-examine the relationship between clan culture and internal pay gap. We use the per capita rice planting area (RICE)⁷ and the number of wars in the Song Dynasty (WAR)⁸ of the province where the firm is located as the instrumental variables of clan culture. Talhelm et al. (2014) point out that rice planting needs a complete water conservancy irrigation system and the cooperation of the population in the planting area. Due to this, it is easy to form small cooperative groups (clans) in areas with high per capita rice planting area, which provides a basis for the cultivation of clan culture. The per capita rice planting area in 1990 is created by the natural environment (Freedman, 1966; Pan et al., 2019b), with strong exogenous characteristics. So, the per capita rice planting area in 1990 is a suitable instrumental variable. In addition, many wars broke out in the Song Dynasty of China, resulting in large-scale population migration, especially among aristocratic families, which changed the geographical pattern of clan culture distribution (Zhang & Ma, 2017). Therefore, the more wars break out in the Song Dynasty, the weaker the local clan culture is. Besides, the number of wars in the Song Dynasty do not directly affect corporate governance. Referring to Pan et al. (2019b), we use the number of wars in the Song Dynasty as another instrumental variable of clan culture.

Table 10 shows the regression results of the instrumental variable method. Our instrumental variables have passed the K-P LM unrecognizability test and C-D Wald weak instrumental variable test ($F > 10$), which indicates that our instrumental variables are not weak instrumental variables. The results of the first stage show that the per capita rice planting area is significantly positively correlated with internal pay gap, while the number of wars in the Song Dynasty (WAR) is significantly negatively correlated with internal pay gap (GAP), that is, the instrumental variables conform to the theoretical expectation. The regression results of the second stage show (as in columns (2) and (4)) that the coefficient of CLAN is still significantly positive at the level of 1%, which means that after controlling the impact of endogenous problems, clan culture still has a significant role in promoting the internal pay gap of family firms.

4.2.6. Redefining family firms

Anderson and Reeb (2003) and Burkart et al. (2003) define family firms based on the minimum proportion of family ownership. So, will the redefinition of family business affect our results? Therefore, we define family business based on the minimum shareholding ratio of family firms, including 5%, 10%, 15% and 20%, and analyse whether the sample changes caused by changes in family ownership have an impact on our main conclusion. Columns (1) to (4) in Table 11 are the regression results of the impact of the family shareholding ratio of 5%, 10%, 15% and 20% on the internal pay gap of family firms. The coefficients of CLAN are significantly positive at the 1% level, that is, our main conclusions are robust.

⁷We obtain the data of rice planting area in 1990 from CSMAR and CEIC databases.

⁸We obtain the data of the number of wars in the Song Dynasty in the provinces from *LiDaiBingJiaBiZhengZhiDi* (《历代战争兵家必争之地》).

Table 10. Instrumental variables (IV-2SLS).

Variable	CLAN Step I (1)	GAP Step II (2)	CLAN Step I (3)	GAP Step II (4)
RICE	2.116*** (70.95)			
WAR			-0.006*** (-30.47)	
CLAN		0.117*** (10.09)		0.233*** (9.80)
LEV	0.171*** (4.80)	-0.015 (-0.50)	0.073* (1.77)	-0.026 (-0.86)
ROA	-0.012 (-0.14)	0.298*** (4.26)	-0.058 (-0.59)	0.276*** (3.86)
SIZE	0.010 (1.15)	0.196*** (28.36)	-0.013 (-1.36)	0.204*** (28.74)
CASH	0.054 (0.60)	0.683*** (9.11)	0.285*** (2.69)	0.613*** (7.93)
TOP1	-0.116** (-2.47)	-0.069* (-1.79)	-0.083 (-1.54)	-0.053 (-1.35)
LIST	-0.008 (-1.00)	-0.021*** (-2.99)	-0.038*** (-3.92)	-0.019*** (-2.73)
BOARD	0.045 (1.11)	0.017 (0.50)	-0.080* (-1.69)	0.030 (0.89)
INDEND	1.148*** (8.19)	0.304*** (2.62)	0.968*** (5.95)	0.185 (1.53)
DUAL	0.055*** (4.20)	-0.093*** (-8.56)	0.085*** (5.56)	-0.100*** (-8.92)
SUBIRM	-0.021** (-2.26)	0.051*** (6.61)	0.018 (1.61)	0.049*** (6.14)
GDPGRO	-0.256*** (-4.80)	0.044 (1.00)	-0.194*** (-3.11)	0.067 (1.45)
MINOR	-1.167*** (-17.22)	0.126** (2.23)	-0.814*** (-10.26)	0.208*** (3.48)
CONSTANT	-0.295 (-1.46)	-3.309*** (-19.83)	1.138*** (4.85)	-3.549*** (-20.64)
INDUSTRY	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes
Unrecognizable test (k-p LM p value)	0.000***		0.000***	
Weak IV test (C-D Wald F value)	5034.239		928.296	
N	10595	10595	10799	10799
Adj.r ²	0.358	0.214	0.128	0.167

Table 10 reports the robustness results of instrumental variables method. Standard errors of the estimates are adjusted by White heteroscedasticity. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

5. Further analysis

5.1. Mechanism analysis

The previous article has verified that clan culture can significantly increase the pay gap within family enterprises. However, the mechanism of the intermediate impact is still unclear. Under the influence of clan culture, natural internal trust has been formed among relatives, which causes the family business pay distribution to favour relatives. Furthermore, scholars have paid attention to the fact that clan culture helps to enhance the level of trust among acquaintances, improve the frequency of information exchange and form stronger ethics (Dai, 2014; Pan et al., 2019a), and the level of trust can affect the internal pay gap of enterprises (Yin et al., 2022). Therefore, we construct the following

Table 11. Redefining family firms.

Variable	GAP			
	≥ 5% (1)	≥ 10% (2)	≥ 15% (3)	≥ 20% (4)
CLAN	0.054*** (8.36)	0.056*** (8.66)	0.058*** (8.68)	0.063*** (9.27)
LEV	-0.002 (-0.05)	-0.002 (-0.07)	-0.000 (-0.01)	-0.020 (-0.59)
ROA	0.254*** (3.48)	0.270*** (3.56)	0.283*** (3.54)	0.272*** (3.26)
SIZE	0.201*** (25.97)	0.203*** (25.95)	0.208*** (25.61)	0.209*** (24.51)
CASH	0.669*** (8.45)	0.629*** (7.90)	0.650*** (7.98)	0.706*** (8.29)
TOP1	-0.060 (-1.49)	-0.028 (-0.70)	-0.004 (-0.10)	0.018 (0.40)
LIST	-0.030*** (-4.33)	-0.034*** (-4.89)	-0.035*** (-4.81)	-0.036*** (-4.74)
BOARD	-0.004 (-0.11)	-0.002 (-0.07)	-0.012 (-0.33)	-0.031 (-0.85)
INDEND	0.362*** (3.11)	0.355*** (2.99)	0.326*** (2.70)	0.265** (2.14)
DUAL	-0.090*** (-8.65)	-0.092*** (-8.81)	-0.099*** (-9.33)	-0.100*** (-9.09)
SUBIRM	0.052*** (6.46)	0.050*** (6.15)	0.049*** (5.95)	0.053*** (6.21)
GDPGRO	0.027 (0.42)	0.024 (0.38)	0.030 (0.46)	0.017 (0.25)
MINOR	0.085* (1.66)	0.081 (1.58)	0.084 (1.54)	0.093 (1.48)
CONSTANT	-3.334*** (-19.13)	-3.380*** (-19.24)	-3.458*** (-19.16)	-3.437*** (-18.29)
INDUSTRY	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes
N	10682	10340	9765	8997
Adj.R ²	0.221	0.223	0.233	0.235

Table 11 reports the results of the conservatism of the family shareholding ratio of 5%, 10%, 15% and 20%, respectively. The values in brackets are *t* values adjusted by white heteroscedasticity. *, ***, **** are significant at 10%, 5% and 1% levels, respectively.

model by the test methods of Liu et al. (2021) and Jiang (2022) for reference. The model is tested in two ways to determine whether or not the trust preference for clan culture is the determinant of internal pay gaps.

$$FAMTRUST_{i,t} \text{ or } ALITRUST_{i,t} = \beta_0 + \beta_1 \times CLAN_i + CONTROLS + INDUSTRY + YEAR + \varepsilon_{i,t} \quad (5)$$

The first way is to identify the role of trust factors in the internal pay gap by investigating the internal trust environment. A region with a strong internal trust environment shows that people trust the members inside the boundary more, enabling the 'internal and external differences' of kinship trust to be more clearly reflected. This paper uses the World Values Survey (WVS)⁹ to investigate the family values of people in various countries and regions around the world: 'how important do you think family is in your life?' We

⁹WVS (World Values Survey) conducted a questionnaire survey on the values of people in various provinces of China in 2007, 2012 and 2017. The questionnaire included a survey on the degree of trust between family members and other people. 'These people' include: (1) family members, (2) neighbours, (3) acquaintances, (4) people who met for the first time, (5) people with different religious beliefs, and (6) people of other nationalities.

assign 'very trust' as 4, 'comparative trust' as 3, 'less trust' as 2, 'very distrust' as 1. The higher the value, the more trustworthy the relatives are. According to the average value of each province in China, this paper constructs the internal trust (FAMTRUST) index of the province where the enterprise is registered.

The second way is to identify the role of trust factors in pay preferences by examining the external trust environment. Every culture and society has a trust boundary. Compared with people outside the boundary, people within the boundary are more trustworthy (Fukuyama, 1995). When clan culture in a region is strong, individuals will trust their relatives more and exclude non-relatives. Therefore, under the influence of clan culture, the external trust is low. We use the World Values Survey (WVS) to investigate the values of strangers of people in various countries and regions around the world: 'how important do you think the person you met for the first time is in your life?', we assign 'very trust' as 4, 'comparative trust' as 3, 'less trust' as 2, 'very distrust' as 1, and the higher the value, the more trustworthy the stranger is. According to the average value of each province in China, this paper constructs the external trust index of each province where the enterprise is registered.

Columns (1) and (2) of Table 12 are the test results after adding the mechanism variable. The coefficients of the explanatory variable CLAN are significantly positive at the 1% level. This shows that clan culture does expand the pay gap within family enterprises through trust preference.

5.2. Decomposition test of internal pay gap

The previous theory and test results show that clan culture can strengthen the internal pay gap of family enterprises, which can be explained by the internal trust mechanism of 'collectivism' and 'solidarity and mutual benefit'. The first is 'collectivism', which is based on the principle of trust between group members but exclusion of outsiders. Due to the high proportion of relatives and senior managers in family businesses and the relatively small number of relatives and ordinary employees, relatives can control the company in the hands of the family and directly obtain utility through control, which will affect the distribution of compensation benefits between senior managers and employees to a greater extent. Second, clan culture is manifested by the concept of 'solidarity and mutual benefit' among relatives contained in internal trust. It makes self-interest behaviour of family members tend to be long-term, and ordinary employees are difficult to protect their own compensation rights. In short, clan culture will bring too much damage to employees' compensation. Therefore, in order to test whether the significant positive relationship between clan culture and internal pay gap comes from the increase of executive pay and the decrease of employee pay, we analyse the impact of clan culture on the average salary of executives and employees respectively.

Table 13 test results show that in the executive compensation group, the regression coefficient of CLAN is 0.017, which is significant at the 1% level; In the employee compensation group, the CLAN regression coefficient was significantly negative at the 1% level. Specifically, clan culture, through the significant pay gap within the family business, comes from the increase in the average salary of executives and the decrease in the average salary of employees. This further shows that internal trust is the specific mechanism to explain the relationship between clan culture and internal pay gap in family enterprises.

Table 12. Mechanism analysis.

Variable	FAMTRUST (1)	ALITRUST (2)
CLAN	0.009*** (10.77)	-0.003** (-2.33)
LEV	-0.008** (-2.34)	0.020*** (4.00)
ROA	0.002 (0.26)	-0.013 (-1.09)
SIZE	0.003*** (3.99)	0.003** (2.36)
CASH	0.024*** (2.62)	-0.006 (-0.50)
TOP1	-0.004 (-0.81)	-0.020*** (-3.08)
LIST	-0.000 (-0.53)	0.005*** (3.80)
BOARD	0.005 (1.27)	0.013* (1.88)
INDEND	-0.112*** (-8.28)	0.060*** (3.12)
DUAL	-0.001 (-1.03)	-0.001 (-0.41)
SUBIRM	-0.003*** (-2.82)	-0.007*** (-5.11)
GDPGRO	0.032** (2.52)	0.010 (1.56)
MINOR	-0.060*** (-38.95)	0.179*** (75.30)
CONSTANT	3.738*** (193.93)	1.771*** (61.86)
INDUSTRY	Yes	Yes
YEAR	Yes	Yes
N	10796	10796
Adj.R ²	0.047	0.070

Table 12 reports mechanism analysis. The values in brackets are *t* values adjusted by white heteroscedasticity. *, ***, **** They are significant at 10%, 5% and 1% levels, respectively.

5.3. Cross section analysis

The research results of baseline regression have shown that the stronger the clan culture concept in the area where the family business is located, the higher the level of internal pay gap. However, the governance environment faced by family enterprises is an important contingency factor in their corporate governance, which will affect the characteristics of the pay gap within family enterprises. To this end, we explore the impact of clan culture on the family and internal pay gap from the perspectives of executive governance responsibility and regional development.

5.3.1. Senior management governance responsibility

The purpose of our study is to prove that relatives of family business executives may bear the responsibility of protecting the interests and stability of the family. Subsequently, the behaviour of these listed family enterprises appeared to be more confident of internal trust. They were unwilling to give high treatment to external employees and lower pay to external employees. The behaviour of internal trust can be guided by fewer non-relative executives, less mobility of executives, and higher salary levels of relatives. We admit that

Table 13. Decomposition test of internal pay gap.

Variable	MANC (1)	EMPC (2)
CLAN	0.017*** (2.61)	-0.038*** (-7.45)
LEV	-0.160*** (-4.98)	-0.138*** (-5.06)
ROA	0.304*** (3.90)	0.046 (0.70)
SIZE	0.270*** (35.91)	0.066*** (10.70)
CASH	0.900*** (11.64)	0.212*** (3.24)
TOP1	-0.118*** (-3.02)	-0.025 (-0.81)
LIST	-0.032*** (-4.70)	-0.003 (-0.53)
BOARD	-0.032 (-1.00)	-0.060** (-2.36)
INDEND	0.644*** (6.01)	0.218** (2.39)
DUAL	-0.070*** (-6.83)	0.014* (1.76)
SUBIRM	0.077*** (9.67)	0.025*** (4.17)
GDPGRO	-0.039 (-0.87)	-0.067 (-1.47)
MINOR	-0.082* (-1.83)	-0.169*** (-5.87)
CONSTANT	6.516*** (39.47)	9.979*** (75.34)
INDUSTRY	Yes	Yes
YEAR	Yes	Yes
N	10799	10799
Adj.R ²	0.503	0.517

Table 13 reports decomposition test of internal pay gap. The values in brackets are *t* values adjusted by white heteroscedasticity. *, *****, They are significant at 10%, 5% and 1% levels, respectively.

it is difficult to directly prove the relationship between clan culture and the governance responsibilities of the chairman or CEO. Therefore, we use the following methods for inspection.

5.3.1.1. Distinguish whether senior executives are locals. Hometown identity is consistent with clan culture, which not only has a geographical basis, but also includes psychological connotations such as customs and values, reflecting the close emotional ties formed by the interaction between people and their hometown (Gustafson, 2009). If individuals are closer to their hometown, it can be considered that they are more likely to accept clan culture, so the sense of clan identity will be stronger. Referring to the practice of Hu et al. (2017), this paper uses whether the province or prefecture level city of origin of the chairman and CEO is located in the location of the family business as the proxy variable to measure home identity. If one person is the same, take 1, otherwise it is 0. The hypothesis of this paper is tested in groups. The results are shown in Table 14 (1) - (2). Column (1) of Table 14 reveals that there is a significant positive correlation between clan

culture and internal pay gap in the family business of local executives at the 1% level; Table (2) shows that there is a significant positive correlation between clan culture and internal pay gap coefficient of the family business in which the non-local executives are located at the 1% level. However, the results of inter-group differences show that the absolute value of the coefficient in column (1) is much higher than that in column (2). The results indicate that if the native place of executives is the same as the location of the enterprise, the impact of clan culture on the internal pay gap of family enterprises is more significant.

5.3.1.2. Distinguish whether the chairman and CEO are relatives. Chinese in clan culture tend to believe that blood is their identity label for their mutual trust, and they are more concerned about the responsibilities and interests of relatives in the clan (Pan et al., 2019b). According to whether the chairman and general manager of the enterprise are relatives or not, the sample is divided into relatives and non-relatives. The results are shown in columns (3) - (4) of Table 14 below. Column (3) shows that the clan coefficient of the kinship enterprise group is 0.071; In column (4), the coefficient of non-kinship was

Table 14. Senior management governance responsibility.

Variable	GAP			
	Local (1)	Non- local (2)	Kinship (3)	Non-kinship (4)
CLAN	0.067*** (7.66)	0.045*** (4.70)	0.071*** (8.13)	0.042*** (4.37)
LEV	-0.013 (-0.32)	-0.047 (-1.01)	-0.004 (-0.09)	-0.024 (-0.59)
ROA	0.200** (2.07)	0.400*** (3.66)	0.334*** (2.86)	0.288*** (3.08)
SIZE	0.180*** (16.63)	0.231*** (21.27)	0.250*** (22.27)	0.163*** (15.28)
CASH	0.425*** (3.83)	0.944*** (8.60)	0.619*** (5.85)	0.676*** (6.00)
TOP1	0.102* (1.79)	-0.267*** (-4.88)	-0.068 (-1.31)	-0.062 (-1.03)
LIST	-0.020** (-2.09)	-0.034*** (-3.14)	-0.051*** (-5.32)	-0.029*** (-2.80)
BOARD	-0.041 (-0.90)	0.089* (1.77)	0.058 (1.23)	-0.006 (-0.13)
INDEND	0.322** (2.01)	0.399** (2.37)	0.742*** (5.02)	0.027 (0.15)
DUAL	-0.081*** (-5.39)	-0.096*** (-6.66)	-0.062*** (-4.40)	-0.014 (-0.48)
SUBIRM	0.082*** (6.87)	0.025** (2.30)	0.020* (1.95)	0.093*** (7.53)
GDPGRO	0.046 (0.69)	-0.043 (-0.44)	0.016 (0.27)	0.012 (0.14)
MINOR	0.097 (1.30)	0.117* (1.72)	0.068 (0.84)	0.075 (1.15)
CONSTANT	-2.881*** (-11.96)	-4.074*** (-16.74)	-4.626*** (-18.70)	-2.410*** (-9.92)
INDUSTRY	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes
N	5394	5405	5103	5696
Adj.R ²	0.232	0.243	0.267	0.195
Difference in coefficients between groups	Chi2=5.57, p=0.02**		Chi2 = 2.86, P = 0.09*	

Table 13 reports senior management governance responsibility in cross section analysis. The values in brackets are *t* values adjusted by white heteroscedasticity. *, ***, **** They are significant at 10%, 5% and 1% levels, respectively.

0.042, which was significant at 1% statistical level. However, the results of inter-group differences show that the absolute value of the coefficient in column (3) is significantly higher than that in column (4). Therefore, executives are family enterprises with kinship, and the positive impact of clan culture and internal pay gap is more significant.

5.3.2. Regional development level

China is at the stage of economic transformation and development, and its development has naturally accelerated the process of urbanisation in various regions. As regional development continues to deepen, the degree of market-oriented reform, economic level, and degree of opening to the outside world will continue to improve. Meanwhile, less government intervention in economic activities will inevitably lead to fierce regional market competition, making internal salary designs more market-driven (Chen et al., 2010; Wu et al., 2018). It is possible to further increase the pay gap within an enterprise. If other factors are not taken into account, a high clan culture intensity can coexist with regions with a high level of regional development and a large internal pay gap (Guangdong and Zhejiang) and regions with a high level of regional development and a small internal pay gap (Jiangxi). Therefore, due to the above external differences, we grouped them according to the degree of marketisation, economic environment and openness.

First, according to the annual median value of the degree of marketisation where the family business is located, the sample is divided into the high degree of marketisation group and the low degree of marketisation group, and the hypothesis of this paper is grouped and tested. The marketisation index is derived from *China Sub-Provincial Marketisation Index Report* (Wang et al., 2017). The grouping test results are shown in columns (1) - (2) of Table 15. Column (1) shows that in regions with high degree of marketisation, clan culture is significantly positively correlated with the internal pay gap of family enterprises at the level of 1%; Table (2) shows that in areas with low degree of marketisation, there is no significant difference between clan culture and the internal pay gap of family enterprises, and the test results of the coefficient mean between groups are significant. The grouping test results demonstrate, to a certain extent, that the positive effect of clan culture and internal pay gap in family enterprises in high marketisation level areas is stronger than that in low marketisation level areas.

Second, according to the annual median of regional per capita GDP, we divide the samples into poor economic environment and good economic environment groups, and tests the hypothesis of this paper. Column (1) of Table 15 shows that for family businesses with good economic environments, clan culture significantly positively correlates with the internal pay gap at the level of 1%; Column (2) shows that for family enterprises with poor economic environments, the coefficient of clan culture and internal pay gap is not significant, and the average coefficient difference between groups is significant. Thus, the grouping test results show that if the economic environment is better, the impact of clan culture on the internal pay gap of family enterprises is more significant.

Third, according to the annual median of the degree of opening up (the actual amount of foreign capital used (10000 yuan)/nominal GDP), the sample is further divided into the high degree of opening up group and the low degree of opening up group. Column (5) shows that for enterprises in areas with a high degree of openness, clan culture is significantly positively correlated with the internal pay gap coefficient at the level of 1%; Column (6) indicates that the results of

Table 15. Regional development level.

Variable	GAP					
	(1)	(2)	(3)	(4)	(5)	(6)
CLAN	0.072*** (8.79)	0.004 (0.31)	0.096*** (11.49)	0.009 (0.87)	0.090*** (10.02)	0.016 (1.60)
LEV	0.048 (1.18)	-0.062 (-1.32)	0.007 (0.16)	-0.013 (-0.29)	0.019 (0.47)	-0.055 (-1.16)
ROA	0.399*** (4.23)	0.134 (1.16)	0.334*** (3.22)	0.207** (1.98)	0.186** (1.97)	0.402*** (3.45)
SIZE	0.201*** (20.42)	0.202*** (16.42)	0.191*** (18.89)	0.210*** (17.87)	0.214*** (22.13)	0.172*** (13.55)
CASH	0.589*** (5.96)	0.748*** (5.70)	0.478*** (4.62)	0.943*** (7.85)	0.596*** (5.77)	0.844*** (6.83)
TOP1	-0.131** (-2.55)	-0.004 (-0.06)	-0.075 (-1.42)	-0.061 (-1.01)	-0.059 (-1.17)	-0.073 (-1.09)
LIST	-0.018* (-1.93)	-0.027** (-2.55)	-0.047*** (-4.94)	-0.021** (-2.05)	-0.024*** (-2.66)	-0.021* (-1.87)
BOARD	0.009 (0.20)	0.038 (0.73)	0.014 (0.32)	0.045 (0.87)	0.028 (0.67)	0.001 (0.01)
INDEND	0.594*** (3.99)	0.065 (0.35)	0.545*** (3.59)	0.180 (0.99)	0.337** (2.32)	0.432** (2.21)
DUAL	-0.099*** (-7.50)	-0.065*** (-3.84)	-0.075*** (-5.39)	-0.105*** (-6.68)	-0.081*** (-6.15)	-0.091*** (-5.29)
SUBIRM	0.033*** (3.20)	0.064*** (5.20)	0.068*** (6.25)	0.043*** (3.61)	0.038*** (3.73)	0.075*** (5.50)
GDPGRO	0.070 (0.79)	-0.003 (-0.03)	0.027 (0.31)	-0.009 (-0.11)	0.025 (0.31)	0.001 (0.02)
MINOR		0.093* (1.76)		0.035 (0.66)	0.020 (0.18)	0.079 (1.35)
CONSTANT	-3.413*** (-15.04)	-3.340*** (-12.35)	-3.302*** (-14.29)	-3.469*** (-13.22)	-3.707*** (-17.07)	-2.720*** (-9.47)
INDUSTRY	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes
N	6252	4547	5702	5097	6685	4114
Adj.r ²	0.236	0.219	0.254	0.215	0.246	0.198
Difference in coefficients between groups	Chi2=22.85, p<0.000***		Chi2=45.90, p<0.000***		Chi2=30.06, p<0.000***	

Table 14 reports regional development level in cross section analysis. The values in brackets are *t* values adjusted by white heteroscedasticity. Column (1) and column (3) minor variables are deleted due to collinearity. *, ***, **** They are significant at 10%, 5% and 1% levels, respectively.

enterprises in regions with a high degree of openness are not significant, but the coefficient is negative, and the test results of the average coefficient between groups are significant. The test results show that in regions with a high degree of opening to the outside world, the positive impact of clan culture and the internal pay gap of family enterprises is more significant.

The above results show that it is not the case that the influence of the informal institution can be naturally reduced once the formal institution is perfected. While building and improving the formal institution, the government also ought to consider the informal institution. Therefore, they need to suppress the parts of traditional culture that are not conducive to internal pay inequality. In addition, they also have to build a cultural environment for the family business pay management institution and governance model that is compatible with the process of common prosperity.

5.4. Economic consequences

For family businesses, the most critical issue is whether clan culture will affect the performance, market value, and productivity of the business. Therefore, this paper examines whether the interaction between clan culture and internal pay gap can have an impact on enterprise performance, market value and production efficiency, and examines the economic consequences of the aforementioned impact of clan culture, so as to try to provide a new perspective for understanding the governance effect of clan culture. The model (6) we designed further analyzes the empirical impact of clan culture on the business performance and value of family enterprises, and the control variables are basically consistent with model (1) except for enterprise performance (ROA).

$$ROA_{i,t}, TOBINQ_{i,t} \text{ or } TFP_{i,t} = \tau_0 + \tau_1 \times CLAN_i + \tau_2 \times CLAN_i \times GAP_{i,t} + \tau_3 \times GAP_{i,t} + CONTROLS + INDUSTRY + YEAR + \varepsilon_{i,t} \quad (6)$$

It can be seen from Table 16 that under the indicators of enterprise performance (ROA), market value (TOBINQ)¹⁰ and production efficiency (TFP),¹¹ the coefficient of $CLAN \times GAP$ is always not significant. In other words, the interaction between clan culture and internal pay gap does not significantly affect enterprise performance, market value and production efficiency. Combined with the above analysis in this paper, it can be shown that under the interactive influence of clan culture and internal pay gap, corporate behaviour has become conservative. Consequently, since executives' salaries are naturally high, they will tend to stick to their familiar paths and engage less in venture capital, innovation, mergers and acquisitions, and other activities that improve enterprise performance and value. In terms of employee rights and interests, clan culture makes it more difficult for them to protect their salary rights through various means, reducing their organisational satisfaction and effort, and causing production activities to be short-term and inefficient. In combination with the empirical findings in Table 12, the above findings suggest that even though the governance effect of clan culture on internal pay gaps is not obvious, it not only hampers the optimisation of executive pay structures, but also is not conducive to enterprise development. This finding also provides supporting evidence from the micro enterprise level for the necessity of the reform of China's government's income distribution system in recent years.

6. Conclusion

The values and inheritance of clan cannot be neglected in the traditional cultural forms of Chinese family enterprises, and the natural trust and ties derived from clan blood make family enterprises different from non-family firms. As we focus on the informal system, our

¹⁰TOBINQ = market value/total assets.

¹¹ $TFP_{it} = \exp(\ln Y_{it} - \beta_k \ln K_{it} - \beta_l \ln L_{it})$, among, $\ln Y_{it} = \beta_0 + \beta_k \ln K_{it} + \beta_l \ln L_{it} + \sum_m \delta_m \text{year}_m + \sum_n \lambda_n \text{reg}_n + \sum_k \zeta_k \text{ind}_k + \varepsilon_{it}$, the output (LnY) uses the natural logarithm of operating income as the measurement index, the labour input (LnL) uses the natural logarithm of the number of employees as the measurement index, and the natural logarithm of fixed assets as the measurement index of capital input, Investment (LnK) is measured by the natural logarithm of capital expenditure (cash paid for the purchase and construction of fixed assets, intangible assets and other long-term assets – cash recovered from the disposal of fixed assets, intangible assets and other long-term assets). In addition, the observable agent variable of productivity is the natural logarithm of intermediate input (LnM), namely, the cash purchased from goods and services, and the annual, regional and industrial effects are fixed.

Table 16. Economic consequences.

Variable	ROA (1)	TOBINQ (2)	TFP (3)
CLAN	-0.003 (-1.28)	-0.090 (-1.54)	0.035* (1.91)
CLAN × GAP	0.002 (1.12)	0.011 (0.27)	-0.001 (-0.09)
GAP	0.003 (1.27)	0.198*** (3.61)	0.013 (0.69)
LEV	-0.155*** (-19.87)	-0.043 (-0.29)	0.494*** (12.20)
SIZE	0.019*** (14.19)	-0.898*** (-26.67)	0.674*** (75.23)
CASH	0.286*** (20.70)	3.663*** (13.21)	1.284*** (13.17)
TOP1	0.048*** (10.20)	0.737*** (6.69)	0.263*** (6.34)
LIST	-0.010*** (-11.37)	0.075*** (3.26)	-0.062*** (-8.24)
BOARD	0.015*** (2.92)	0.088 (0.82)	0.022 (0.59)
INDEND	0.010 (0.52)	1.191*** (3.29)	-0.089 (-0.70)
DUAL	0.003** (2.04)	0.199*** (5.84)	-0.045*** (-3.90)
SUBIRM	-0.003*** (-2.71)	0.104*** (4.33)	0.073*** (7.96)
GDPGRO	0.009 (1.33)	0.202* (1.69)	0.064 (0.63)
MINOR	-0.008 (-0.77)	-0.533*** (-4.44)	-0.273*** (-5.92)
CONSTANT	-0.366*** (-12.74)	20.626*** (30.03)	-6.305*** (-32.11)
INDUSTRY	Yes	Yes	Yes
YEAR	Yes	Yes	Yes
N	10799	10530	10270
Adj.R ²	0.308	0.364	0.703

Table 15 reports Economic consequences. The values in brackets are *t* values adjusted by white heteroscedasticity. *, ***, **** They are significant at 10%, 5% and 1% levels, respectively.

study examines how clan culture influences the internal pay gap in family enterprises. As a result, it reveals the internal development law of family enterprise pay governance. It also contributes to the analysis and improvement of the design mode for family enterprise pay contracts under the new development pattern.

Our study finds that: First, local clan culture expands the internal pay gap of family listed enterprises. With a stronger clan culture atmosphere, family enterprises can offer different pay preferences for executives and employees through the internal trust mechanism. Second, the conclusion of our study is still robust after considering a series of robustness tests by replacing the regression method, replacing the measurement methods of independent variables and dependent variables, and eliminating sample deviation interference. Third, by adding control variables, Oster (2019)'s way of solving omitted variables, and the per capita rice area and the number of wars in the Song Dynasty as instrumental variables, the conclusion of our study has not changed after controlling the endogenous problem of omitted variables and reverse causality to a certain extent. Fourth, our study illustrates the

impact of clan culture on governance of enterprises based on different internal and external conditions, and finds that clan culture has a greater impact on the internal pay gap of local executives, executives with the same surname, family members with higher participation, a better economic environment, and a higher degree of openness. Fifth, the study of economic consequences shows that the interaction between clan culture and internal pay gap has a negative impact on enterprise performance, market value and production efficiency.

Although we try our best to verify that the impact of clan culture on the internal pay gap in family enterprises is robust, it is worth noting that there are still some limitations in this paper: First, due to the limited data, it is not possible to directly test potential mechanisms such as individuals' identification with clan culture, which needs to be supplemented by interviews and questionnaires. Second, the measurement of clan culture is a regional variable, which may contain the noise of Confucian culture, and clan governance is usually based on Confucian ethics. So, we cannot exclude the influence of Confucian culture on the variable, and to reach a more robust conclusion will require further exploration and analysis in the future. Third, owing to limitations of data collection, the measurement of clan culture is a constant value of clan densities at the regional level. In addition, it is difficult to reflect the dynamic changes in clan culture, which needs to be further collected and supported with multiple points of data. Fourth, since instrumental variables are currently limited, there will be limitations to endogenous tests, which will require obtaining additional instrumental variables.

Our findings have the following implications. First, clan culture derives from clans, which still maintain strong vitality in modern society. They constantly adapt organisational rules to the changes in the social and economic environment in order to keep pace with the development process. According to our study, since clan culture is formed by geographical proximity and blood relationships, family enterprises can bring internal governance problems through the function of clan culture. They delay the growth of enterprise performance, market value and productivity, and then hinder the operation and development of enterprises. Second, 'All things are born, but they know to keep their roots'. While traditional culture reflects changes in cultural psychology, lifestyles, and emotional support, our attention should be paid to this most basic cultural gene and soft power of the Chinese people. Over time, when clan culture has supplemented the shortcomings of the formal systems of the economy and society, the effects of modernisation of the family business governance system cannot be ignored. Third, the conclusion of this paper recommends that family enterprises improve their corporate governance mechanisms by abandoning the negative factors and inheriting the positive factors in Chinese clan culture. By doing this, the traditional culture of clans can adapt to the times within their own families. This will ensure fairness in internal distribution rules within their enterprises, and ultimately allowing for a more prosperous community.

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