Mechanisms influencing inter-channel speculationist behaviour

--Adoption of AI technology for channel governance

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Abstract. Some retailers take advantage of consumers' channel switching behaviour to engage in opportunistic behaviour. As the phenomenon of channel members engaging in opportunistic behaviour becomes more prevalent, it is increasingly important to understand the underlying mechanisms of channel members' opportunistic behaviour and seek effective channel governance strategies. The 300 valid questionnaires recovered were analysed empirically through SPSS 23.0 and Amos 23.0 analysis software, and according to the results of the empirical study, it was known that all hypotheses were tested. information sharing significantly affect the sales effort spillover of horizontal channel members, and sales effort spillover among channel members significantly positively affects the speculative behaviours of channel members, and the AI governance system, as a means of regulating, unifying incentives and monitoring, can guide channel members based on a positive reinforcement perspective, so that channel members can proactively and positively make more sales effort behaviours, and collectively improve the overall performance of the industry.

Keywords: information sharing; sales effort spillover; AI-based governance; speculative behaviour

1   INTRODUCTION

With the rapid development of the Internet and e-commerce, retailers have opened online channels based on channel strategy and consumer demand, transitioning from single-channel to multi-channel sales[1](Liu Yizhi et al., 2022). Some retailers exploit consumers' channel-switching behaviors by engaging in opportunistic actions. As opportunistic behaviors among channel members become increasingly prevalent, understanding the internal mechanisms of such behaviors and finding effective channel governance strategies is becoming crucial. Previous studies have attempted to regulate channel members through contract governance[2] (Feng Chao et al., 2019), authoritative governance[3](Zhuang Guijun, 2012), and relationship governance[4](Chen Jinsong et al., 2019), yet these governance methods have not been fully effective. This is primarily

due to the significant limitations in monitoring and managing the sales efforts of channel members through information technology. This paper posits that artificial intelligence can play a significant role in channel governance.

2   LITERATURE REVIEW

Information sharing means that in a specific transaction or cooperation, partners understand each other's business through information exchange and transmission [5](Morgan, R.M. & Hunt, S.D., 1994). Speculation will lead to transaction costs and operational efficiency of both parties, which will damage the willingness to maintain cooperative relations, and then have a negative impact on the interests of all parties. Because of the inconsistent goals of channel members, speculation is difficult to avoid in channel relations, which makes it one of the core objectives of channel governance to effectively curb the speculation of channel members[6](Lumineau F&liveira N, 2020). Artificial intelligence means that based on cloud computing, computer vision, user portrait and other science and technology, machines can be competent for some complex tasks that human intelligence can complete[7] (Wang Fengquan et. al., 2020). In channel governance through AI, technologies such as accurate clearing and user portrait can accurately and efficiently record consumer behavior data and product attribute data, and then conduct and learn based on these real-time generated data, so as to process and make efforts made by channel members more intelligently. And transform the information in big data into the knowledge needed for channel governance, and obtain better governance solutions by continuously acquiring new knowledge or modifying existing knowledge [8](Zhu Guowei et al., 2021).

3   THEORETICAL HYPOTHESIS

Information sharing exerts a significant spillover effect on green product innovation as it enables enterprises to gain a deeper understanding of customers' concerns and future preferences[9](Janakiraman, 2009). By establishing a comprehensive information sharing system among various horizontal retail channels, it facilitates the exchange of vital information, such as data on customer arrivals and potential customer preferences. This can effectively alleviate retailers' worries about the costs associated with product promotion and services, subsequently minimizing the spillover of sales efforts across horizontal channels.

H1: Information sharing negatively affects sales effort spillovers.

During shopping, consumers may take advantage of the pre-sales services offered by one sales channel, yet end up purchasing products through another horizontal channel. This behavior demonstrates the spillover of sales efforts from channel members who provide pre-sales services. Retailers providing only pre-sales services without completing actual transactions find that consumers use their pre-sales services for free, yet do not contribute to their profits. Consequently, channels that do not invest economically indirectly benefit from those that do, which can heighten the sales efforts of retailers and diminish the promotional drive among major retailers, leading to active

speculation[10](Cao Yu et al., 2019). Given these observations, this paper proposes the following hypotheses:

H2: Sale effort spillovers positively affect opportunistic behavior.

In the multi-channel retail market, horizontal channel distributors, operating as independent entities with their own interests, often do not share close connections with each other, aiming to secure a competitive advantage. Consequently, information sharing among these distributors is not timely, making it difficult to accurately track and record the cost inputs of individual distributors. This lack of information sharing within the same industry[11](Liu et al., 2014) contributes to a low level of information exchange, which, in turn, fosters information asymmetry among members of horizontal channels. This asymmetry can lead to the spillover of sales efforts across horizontal channels. Additionally, it may cause channel members to fear that their sales efforts will not be effectively recognized or rewarded, and they may worry about not receiving proper benefits for their efforts. Alternatively, some channel members might exploit this information asymmetry to benefit from the sales efforts of others, thereby increasing the likelihood of opportunistic behavior. Given these considerations, this paper proposes the following hypotheses:

H3: Sales effort spillovers play an intermediary role between information sharing and speculation.

To motivate sellers to enhance their efforts and adopt more effective strategies, suppliers can reward sellers for their endeavors to boost sales through encouragement and oversight. Some efforts by the seller are visible to the supplier, while others are not. When the supplier is uncertain about how much of the seller's effort costs contribute to the sales volume of the products they supply, it becomes challenging to determine appropriate compensation for the seller[12](Zhang Juliang & Chen Jian 2004). Additionally, it is difficult for channel members to recognize that their efforts will lead to deserved profits, leading them to doubt whether their sales efforts will be adequately protected[13](Issa et al. 2016). This paper suggests that AI-driven incentives and monitoring can effectively address these issues, such as delays in information data collection and the imprecision of decisions made by limited human cognition. AI technology can accurately and efficiently monitor the sales efforts of channel members, offering real-time supervision and intelligently encouraging them, thus mitigating the positive influence of sales effort spillover on opportunistic behavior. Given these insights, this paper proposes the following hypotheses:

H4a: AI-based incentives strengthen the inhibition of incentives on opportunistic behavior caused by sales effort spillovers

H4b: AI-based supervision strengthens the inhibitory effect of supervision on opportunistic behavior caused by sales effort spillovers.

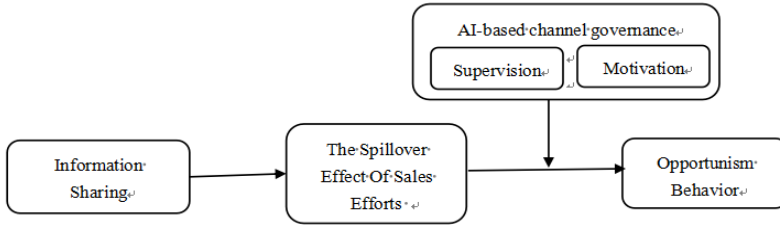Based on the above assumptions, this study puts forward the theoretical framework of Figure 1.

Fig. 1. | Theoretical model

4   QUESTIONNAIRE DESIGN AND RESEARCH

4.1   Data analysis

Reliability and validity test

SPSS22.0 was used to test the reliability and validity of the scale Cronbach's α of all latent variables is greater than 0.7 and CR is greater than 0.8, indicating that the reliability of the scale is good; AVE > 0.5 AVE square root is greater than each correlation coefficient (as shown in Table 1), indicating that the discriminant validity of the model is good; Factor load is > 0.7. The results show that the scale has good validity(as shown in Table 2).

Table 1. | Questionnaire items and reliability test.

Latent variable	Observation items	Estimate	Ave	Cr
Information sharing (IS) Cronbach's α= 0.794	IS1	0.807		
	IS2	0.844		
	IS3	0.761		
	IS4:	0.811	0.663	0.932
	IS5	0.826		
	IS6	0.833		
	IS7	0.817		
Sales effort overflow (SES) Cronbach's α= 0.924	SES1	0.837		
	SES2	0.843		
	SES3	0.812	0.67	0.924
	SES4	0.796		
	SES5	0.794		
	SES6	0.826		
Opportunistic Behavior （OB） Cronbach's α = 0.936	OB1	0.841		
	OB2	0.79		
	OB3	0.841		
	OB4	0.825	0.678	0.937
	OB5	0.812		
	OB6	0.819		
	OB7	0.836		

Incentive mechanism under	IM1	0.844		
AI governance	IM2	0.773	0.636	0.839
(IM)	IM3	0.773		
Cronbach's α= 0.840				
Oversight mechanisms un-	OM1	0.802		
der ai governance	OM2	0.796	0.668	0.858
(OM) Cronbach's α= 0.85	OM3	0.853		

Table 2. | Discriminant validity test.

Variable	Average	SD	IS	SES	OB	IM	OM
IS	3.147	1.383	0.663				
SES	4.823	1.429	0.347 * *	0.67			
OB	4.846	1.400	0.345 * *	0.316 * *	0.678		
IM	4.797	1.412	0.353 * *	0.352 * *	0.356 * *	0.636	
OM	4.915	1.410	0.369 * *	0.374 * *	0.386 * *	0.344*	0.668

Evaluation of the overall model fitting effect

This study uses information sharing as the antecedent variable, opportunistic behavior as the outcome variable, and sales effort spillover as the mediator variable to establish a structural equation model (SEM) to explore the mediating role of opportunistic behavior and sales effort spillover in AI governance channels The model was validated with AMOS 20 on 300 questionnaires returned Root mean square error (RMSEA) by model approximation = 0.037 chi-square degree of freedom (CMIN/DF) = 1.416 goodness of fit (GFI) = 0.921 incremental fitting index (IFI) = 0.981 comparative fitting index (CFI) = 0.981 All the above indexes are within the range, indicating that the fitting effect of the model is good, as shown in Table 3.

Table 3. | Overall Evaluation Index of structural equation model.

Statistical test volume	CMIN/DF	RMSEA	GFI	RFI	TLI	CFI	IFI
Statistics	1.416	0.037	0.921	0.93	0.978	0.981	0.981

4.2 Model path analysis

The SEM is used to assume that the path is shown in Table 4 Information sharing has a significant negative impact on sales effort (=-0.262 p = 0.000); Sale effort spillovers have a significant positive effect on opportunistic behavior (= 0.143 p = 0.000)

Table 4. | Results of path analysis.

Hypothesis	Relationship	Path coefficient	C.R.	P-value	Result
H1	IS → SES	-0.262	-3.951	* *	Support
H2	SES → OB	0.143	2.099	* *	Support

* * * indicates significant correlation at the P < 0.01 level, and the diagonal is the AVE mean variance extraction

Analysis of mediating effect

This paper uses the Bootstrap program suggested by MacKinno to verify the mediating effect of sales effort spillover effect. The results are shown in Table 5 According to the calculation, 95% of the confidence intervals in the path do not contain 0, which indicates that the mediation effect is significant Secondly, the path coefficient of indirect effect of "information sharing → sales effort spillover → speculation" is-0. 0, and the direct effect significantly shows that sales effort spillover and intermediary information sharing negatively affect speculation

Table 5. | Intermediary inspection results.

intermediary effects	Coefficient	Bootse	Bootllci	Bootulci	P value
IS → SES → OB	-0.069	0.026	-0.1271	-0.026	***

* * * indicates significant correlation at the P < 0.01 level, and the diagonal is the AVE mean variance extraction

Analysis of Moderating effectai

In order to test the modulating effect of AI governance, multi-hierarchical regression is used to adjust the effect of incentives. The results are shown in Table 5. In order to avoid the multicollinearity problem between the main effect and the interactive items, the SESIN and other variables are decentralized according to AIKEN [and so on, and then the interactive items are multiplied Model 1 and Model 2 all take OP as dependent variable In model 1, the regression coefficients of SES and IN were 0.20 (p < 0.000) and 0.28 (p < 0.000), respectively In order to test the regulatory effect of AIG in model 2, we put the interaction term into model 2 and find that the F value is 40.594, the change of R2 is 0.253, and the regression coefficient of interaction term is-0.546 It shows that the increase of incentive level under AI governance significantly weakens the speculation behavior of channel members caused by sales effort spillover H4a verification.

Secondly, the regulatory effect of supervision is tested according to the same method. The results are shown in Table 6. Model 1 and Model 2 all take OP as dependent variable In Model 1, the regression coefficients of SES and MO were 0.217 (p < 0.000) and 0.247 (p < 0.000), respectively In order to test the modulating effect of MO in model 2, we put the interaction term into model 2 and find that the significant change of F value is 45.067, the change of R2 is 0.272 and the regression coefficient of interaction term is-11.229 It shows that under the premise of AI governance, with the increase of supervision level, the speculation behavior of channel members caused by sales effort spillover is significantly weakened H4b verification.

Table 6. | Moderating inspection result.

Category	Model 1			Model 2		
	Beta	T	P	Beta	T	P
SES	0.200	3.530	0.000	0.070	1.435	0.152
IM	0.280	4.955	0.000	0.147	3.000	0.003

Interaction items				-0.546	-11.229	0.000
R side		0.155			0.408	
F value		27.331 * *			67.925 * *	
SES	0.217	3.841	0.000	0.102	2.130	0.034
OM.	0.247	4.377	0.000	0.110	2.289	0.023
Interaction items				-0.560	-11.714	0.000
R side		0.141			0.413	
F value		24.379 * *			69.446 * *	

5   CONCLUSIONS

Drawing on the spillover effect theory and AI governance theory, this study reaches the following conclusions through a questionnaire survey: It explores whether information sharing significantly influences the spillover of sales efforts among horizontal channel members. Given that channel members from the same manufacturer engage in both cooperation and competition, there is a high level of information sharing among them, including data on customers, products, and management. This exchange and connectivity of information mitigate the effect of information silos to some extent, making their information relatively symmetrical and leading to the spillover of sales efforts among members. This spillover significantly and positively influences the speculative behavior of channel members. Under the economic man assumption, channel members, realizing they can benefit from others' efforts, will engage in speculative behaviors—both actively and passively, intentionally or unintentionally—to minimize input costs and maximize personal benefits. Channel speculation governance has traditionally relied on incentives and supervision. However, past research primarily focused on negative reinforcement, which impacts channel members differently. For instance, incorrect implementation of positive incentives can lead to dependence on incentives; excessive reliance on supervision alone can breed resentment and encourage more negative actions among channel members. Consequently, this paper advocates for an AI governance system that standardizes and unifies incentives and supervision based on a positive reinforcement approach. This encourages channel members to voluntarily increase their sales efforts, thereby enhancing the overall performance of the industry.

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