FINDING THE RIGHT *MUF-SUF* MIX

MULTI-UNIT FRANCHISING AND CHAIN PERFORMANCE

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Résumé en français : De plus en plus d'enseignes de franchise optent pour une structure de gouvernance appelée multi-franchise, dans laquelle certains franchisés du réseau gèrent non plus seulement un point de vente mais plusieurs (et deviennent ainsi des multi-franchisés par opposition aux mono-franchisés). Dans le présent article nous étudions dans quelle mesure le choix stratégique de la multi-franchise est au service de la performance d'ensemble d'un réseau de franchise. Couplant des ancrages théoriques complémentaires, et mobilisant des données allemandes et suisses, nous avançons que la proportion de multi-franchisés dans un réseau influence la performance d'ensemble de ce réseau. Cependant, si cet effet est bénéfique pour les enseignes jouissant d'une forte image de marque et d'un savoir-faire spécifique, il devient négatif et/ou cyclique au-delà d'une certaine proportion de multi-franchisés et d'un certain degré d'incertitude. Notre étude empirique montre néanmoins qu'un réseau mixte (composé de mono-franchisés et de multi-franchisés) est une structure de gouvernance plus performante qu'un réseau exclusivement mono ou multi-franchisé.

Abstract: Franchise chains can choose to franchise their outlets along two types of governance structure: MUF (multi-unit franchising) versus SUF (single-unit franchising). The present paper addresses the following issue: What is the "right mix" of MUF and SUF in franchise chains? Specifically, we investigate the impact of the MUF-SUF mix on chain performance. Based on German and Swiss data and drawing on resource-based, agency, as well as transaction cost theory perspectives, we argue that the relationship between the proportion of MUF and chain performance is contingent on resources and uncertainties at stake. While the positive performance effect of MUF is amplified in the case of strong brand name and system-specific knowhow, this effect might become negative and/or cyclical beyond a certain level of MUF and uncertainty. Overall, the results of the study indicate that a mix of MUF and SUF is a more efficient governance structure than a pure MUF or SUF form.

Mots clés : franchise, réseau, performance, multi-franchisé, structure de gouvernance

INTRODUCTION

Franchise chains contractually bind an upstream party, the franchisor, to a network of outlets using its brand name and business format, namely the franchisees. This organizational form, used internationally in all retail and services sectors, stands out as a dominant model in the early 21st century. Franchise Facts (2011) reports more than 3,000 franchise chains in the United States, involving 901,093 franchisees, employing approximately 18 million people, and generating an economic output of over $2.1 trillion (about 40.9% of the U.S. retailing sector). In Europe, the European Franchise Federation (EFF, 2011) highlights a growth rate of its members above 8% in the 2007-2009 period, and Fadairo and Lanchimba (2017) show the current dynamism of franchising in emerging markets, particularly China and Brazil.

Success of franchise chains requires an efficient governance structure, implying that the franchisor has to find the "right mix" not only between company-owned and franchised outlets (Sorenson and Sørensen, 2001), but also between multi-unit franchising (MUF) and single-unit franchising (SUF). Under MUF one franchisee owns two or more units in the same franchise chain, and under SUF one franchisee owns only one unit in the franchise chain (Kaufmann and Dant, 1996; Grünhagen and Mittelstaedt, 2005).[1] The literature on the antecedents of chain performance mainly focuses on the first mix (i.e. the correct proportion of franchisees in the chain) and its capacity to deal with resource scarcity and uncertainty/agency problems (Sorenson and Sorensen, 2001). Some authors (Barthélémy, 2008; Perdreau et al., 2015) highlight that the influence of (tangible and intangible) resources on chain performance is contingent on the proportion of franchised outlets, others show, on the contrary, that chain characteristics moderate the influence of the governance structure on performance (Madanoglu and Castrogiovanni, 2017; El Akremi et al., 2015). Despite assuming different directions of causation and forms of moderation, those papers shed light on the decisive role

[1] Under MUF, two forms can be distinguished: Area development franchising is based on a contract that allows a franchisee to run several outlets at a certain time in a specified geographical area. It is often associated with a territorial exclusivity right. Sequential multi-unit franchising refers to a contract that transfers to the franchisee the right to open a new unit in addition to the existing one.

of the interplay between antecedents and the governance structure (i.e. proportion of franchised outlets) in explaining chain performance.

However, by opposing franchised units to company-owned units these studies also rely on a rather narrow view of the polymorphic reality of franchising networks: they do not address the second mix, namely the "right mix" of MUF and SUF in franchise chains. An extensive literature already analyzes the rationales for adopting MUF versus SUF (e.g. Hussain et al., 2013, Lanchimba 2014), yet the possibility of mixing MUF and SUF within a chain, and the impact of such a mix on chain performance, have not been examined. We address this gap in our paper. In particular, we ask the following questions: What is the impact of the organizational choice (i.e. a mix of MUF and SUF) on chain performance? Can we find an optimal MUF-SUF mix? Hence, our study follows a similar line as Sorenson and Sørensen (2001), yet looks for a new "right mix", namely between MUF and SUF. Our theoretical framework is based on the research results in two bodies of literature on franchising: first, more than 40 years' research addressing the impact of the mix of franchised and company-owned units on chain performance, and second, recent work on the determinants of the governance choice between MUF and SUF.

Since the proportion of MUF is a strategic choice that is context-dependent (Bercovitz, 2004; Gomez et al., 2010), in this study we aim at estimating the influence of the interaction of the governance structure (i.e. MUF-SUF mix) with the chain-specific contextual factors on chain performance. Our explanatory variables are thus interactive ones, allowing us to econometrically examine the joint impact of contextual antecedents (resources and uncertainty) and MUF-SUF mix on the performance of 491 German and 176 Swiss franchise chains. Our results show that adopting MUF improves the chain performance, and that this is even more the case in some specific contexts. Specifically, we provide evidence that the relationship is non-linear; MUF improves franchise performance up to a certain proportion of MUF. "OverMUFing" might, in some cases, be detrimental to chain performance. While previous literature reported the percentage of franchised outlets as a potential barrier to performance (Barthélémy, 2008), we find that the type of franchising (i.e. MUF-

SUF mix) might influence chain performance – enhancing or mitigating it under specific contextual factors. Our results open the way for new franchising strategies, the question for the franchisor becoming not only whether to franchise or not, to choose MUF or not, but also how to adopt the appropriate MUF-SUF mix in the chain. The paper also provides chain operators with selection criteria to design the best governance structure, depending on the resources and risks at stake.

What is the contribution of this study? Although previous research presents MUF as a governance mode that helps reduce agency and transaction costs and mitigate resource scarcity problems (compared to SUF), no study has tested the impact of MUF-SUF mix on the performance of franchise chains under different contexts (in terms of brand name, system-specific assets, environmental uncertainty and behavioral uncertainty). We thus add to the franchise literature by explaining franchisor's choice of the MUF-SUF mix in a franchise chain. According to our framework, the strategic choice of the governance structure of a franchise chain requires – in addition to the "right mix" of franchising and company ownership – a right mix of MUF and SUF. The results suggest that a mix of MUF and SUF is a more appropriate governance form than a pure MUF or SUF system.

The paper proceeds as follows. Section 2 develops the analytical framework and the hypotheses. Empirical specifications are provided in Section 3. The interactive effects between MUF and several contextual variables on chain performance are presented in section 4. Section 5 discusses the results, and concludes.

THEORETICAL FRAMEWORK AND HYPOTHESES

Despite some recent attempts to include institutional explanations (e.g. Combs et al., 2009; Barthélémy, 2011) to enrich the existing literature, scarce and specific resources (based on resource-based theory) and uncertainty (based on agency and transaction cost theory) are the main factors among the antecedents of franchise performance (e.g. Perdreau et al., 2015; Madanoglu and Castrogiovanni, 2017). We thus develop our hypotheses by (1) distinguishing these two theoretical

perspectives, (2) coupling them with the results of previous research looking for the "right mix" of franchised versus company-owned outlets (starting with the seminal paper of Oxenfeldt and Kelly, 1968-699), and (3) refining them in the case of MUF versus SUF.

Resources, governance, and performance

Brand name (BN). BN is a key resource in the franchise package shared by franchisors with their franchisees that has been shown as determinant in franchising chain performance (Combs et al., 2004). This intangible asset is a specific and difficult-to-imitate resource, which creates competitive advantage and hence protects chains from competitors. Paradoxically however, the franchise literature argues that franchisees have limited incentives to invest in the building of the brand name. Most studies conclude that the more valuable the brand name, the more opportunistic the franchisees (Michael, 2000; Bradach, 1997) become, suggesting that the governance structure can moderate the effect of BN on chain performance (Barthélémy, 2008). When we exclusively consider MUF instead of SUF, the likelihood that the owner of several franchised units will underinvest in terms of local advertising is very limited as compared to the case of a single-unit owner. MU-franchisees, who invest in BN, account for a larger part of the BN of the chain as a whole. Without these investments, the value of the BN might significantly decrease. Moreover, an MU-franchisee is incentivized to contribute to and maintain the BN of the chain, since she can take advantage of a strong BN in all the outlets she controls. On the other hand, a degraded BN is detrimental to all the outlets she controls. Therefore, aligning chain reputation with that of the MUF units is beneficial for all network members. By investing in several units the MU-Franchisee also positively influences long-term goal congruence between MU-Franchisees and the franchisor, and her behavior is more visible to the franchisor (as she manages several outlets), reducing her willingness to free-ride. Consequently, franchisors with a strong BN are more likely to use MUF as a strategic decision to reduce the risk of free-riding (Bercovitz, 2004; Brickley, 1999; Kalnins and Lafontaine, 2004; Vázquez, 2008). Thus, we expect

that the interaction of BN and the proportion of MUF might have a positive effect on chain performance.

Hypothesis 1: The interaction of brand name and the proportion of MUF has an amplifying and positive effect on chain performance.

System-specific assets (SSA). Franchise contracts specify the obligation of franchisors to share their brand name and the business format with their franchisees (Combs et al., 2004). Such a format accounts for specific business practices (such as advertisement, procurement, processes or tools) labeled system-specific assets in the literature (Windsperger and Dant, 2006). Since the intangibility of SSA can be seen as a source of competitive advantage (i.e. strategic value), it increases franchisors' investments in training and supervision aimed at transferring those SSA to their franchisees. Governance structure – and the proportion of MU-Franchisees – thus enhances the benefits of tacit SSA on chain performance. Specifically, MUF enables the franchisor to reduce incurring costs for screening, recruiting, and training (Kaufmann and Dant, 1996) the franchisees to adopt/understand/implement the SSA. In case of high SSA, increasing the proportion of MUF results in diminishing the time and costs needed to transfer the chain-specific and tacit knowledge (as compared to using SUF). Indeed, MU-Franchisees usually have higher administrative capabilities than SU-Franchisees (Grünhagen and Mittelstaedt, 2005) that might increase their respective absorptive capacity (Zahra and George, 2002; Hussler and Rondé, 2015). In addition, high transaction-specific investments resulting from high levels of system-specific assets increase the proportion of MUF due to potential economies of scale effects (Hussain, Perrigot, Mignonac, El Akremi, and Herbach, 2013; Grünhagen and Mittelstaedt, 2002). Therefore, we expect that the interplay of SSA and the proportion of MUF increases chain performance.

Hypothesis 2: The interaction of intangible system-specific assets and the proportion of MUF has an amplifying and positive effect on chain performance.

Uncertainty, governance, and performance

Behavioral uncertainty (BU). Horizontal and vertical agency costs (Madanoglu and Castrogiovanni, 2017) are the two bugbears in managing profitable franchise chains. Reducing franchisees' behavioral uncertainty is thus a key issue to be solved in franchise chains. Franchisors have the possibility to select and reward the most loyal franchisees when assigning MU-Franchising rights (Gillis et al., 2011). In that case, free-riding, adverse selection, and moral hazard problems are mitigated under MUF (Sanchez-Gomez et al., 2010; Jindal, 2011). MUF also leads to a lower number of conflicts due to the smaller number of franchisees that have to be coordinated (Zellner et al., 1980; Weaven and Frazer, 2004). Therefore, increasing the MUF proportion is a way to reduce transaction and agency costs due to lower behavioral uncertainty, and increase transaction value due to more information sharing, thereby stimulating performance. At the same time, however, franchisors transfer a higher fraction of decision management rights to the local franchisees in MUF-chains than in SUF-chains. Specifically, MU-Franchisees have more decision-making power regarding monitoring, local human resource management, and knowledge transfer among local outlets (Hussain and Windsperger, 2010). This in turn might increase behavioral uncertainty at the chain level, because a large MU-Franchisee, thanks to her large bargaining power, may strongly interfere in the management of the chain, counterbalancing the benefits of higher administrative capabilities and potential economies of scale. Therefore, the interaction effect of behavioral uncertainty and the proportion of MUF on chain performance is not straightforward. Thus, we anticipate that:

> *Hypothesis 3: The interaction of behavioral uncertainty and the proportion of MUF has a balancing (enhancing & mitigating) effect on chain performance.*

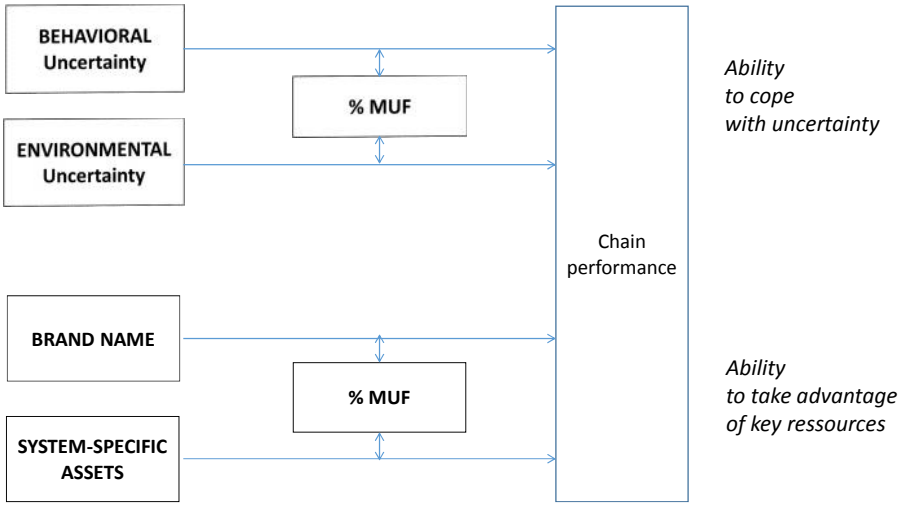
Environmental uncertainty (EU). The transaction-cost reasoning justifies the use of more SUF, assuming that SU-Franchisees have a stronger entrepreneurial orientation compared to outlet managers in a mini-chain, and react more quickly to the changes in local markets (Sorenson and Sorensen, 2001). Therefore, facing a high level of EU, SUF would provide performance advantages

compared to MUF, due to the incentives to quickly exploit local market opportunities (Garg et al., 2005). Since MU-Franchisees are less locally responsive than SU-Franchisees, they may reduce the positive performance effect of SUF under a high level of EU. On the other hand, in case that MU-Franchisees have demonstrated their local market competence, sequential MUF can be considered precisely as a means to reward high-quality franchisees, thereby improving the system efficiency (Sanchez-Gomez et al., 2010). Additionally, a large MU-Franchisee managing several outlets would be able to mitigate local risks among its local outlet portfolio. Furthermore, existing franchisees are familiar with the franchisor's business format and with the local market conditions, which constitutes a complementary argument in favor of MUF as a way to reduce the risk of failure (Bates, 1998). Hence, MUF moderates the negative effect of EU on chain performance (in case of threats). Facing these opposite effects, we expect that the interplay of EU and the percentage of MUF has a balancing effect on chain performance:

Hypothesis 4: The interaction of environmental uncertainty and the proportion of MUF has a balancing (enhancing & mitigating) effect on chain performance.

We summarize hereafter the research model we empirically test in the remainder of the paper:

Figure 1. The research model



METHODS AND MEASURES

Data collection and sample

We test the research model (see figure 1) on German and Swiss data (and variables) originally collected (and built) by one of the authors (Lanchimba, 2014), as part of a collective European research project on franchised networks. The directories of the German and Swiss franchise associations and "Franchise Wirtschaft 2009/10" (a Bond's Franchise Guide–type directory of all franchise systems in Austria, Germany, and Switzerland) list all franchise chains operating in these countries. Various demographic data (the year the chain was established, the number of outlets, royalties, advertising fees, the business sector, etc.) are provided. The selection criteria for the sample frame were (1) at least five franchise outlets and (2) an established franchise relationship of at least four years.[2] The resulting sampling frame consists of 491 German and 176 Swiss franchise systems.

The data were collected via self-administered questionnaires and following a key informant approach (McKendall and Wagner III, 1997). The key informants for this study were senior managers who were mainly responsible for the expansion of their franchises. Information about key informants was retrieved from the "Franchise Wirtschaft". The questionnaires were mailed to the 491 relevant franchise chains in Germany and 176 in Switzerland. A total of 166 questionnaires were completed. The response rate is 27.9% for Germany and 17.05% for Switzerland.

Two methods were used to check for non-response bias. First, the non-response bias was estimated by comparing early versus late respondents (Armstrong and Overton, 1977), where late respondents serve as proxies for non-respondents. Second, the respondents were compared to non-respondents in terms of age, size, advertising fee, and royalties to determine whether non-response was a serious problem for the data (through independent sample t-tests). The results show that there is no significant difference between the respondents and the non-respondents. In addition, on the basis of Podsakoff

[2] To ensure a more secure level of knowledge on the relevant variables about the franchise partners, we assume that a minimum number of outlets or a minimum number of years of inter-organizational experience is necessary.

et al. (2003), the Harman's single factor test was used to examine whether a significant amount of common method variance exists. The results of this factor analysis suggest there is no serious bias problem in the data.[3]

Variables

The study variables are defined as follows.

Dependent variable

The dependent variable is the performance of the franchising chain evaluated by the expansion manager of the franchise chain. We used subjective measures of franchisor performance. According to previous studies (e.g. Dess and Robinson, 1984; Glaister and Buckley, 1998), subjective performance measures are highly correlated with objective performance measures. The franchisors were asked to rate their chain performance on a seven-point Likert scale. Thus, the performance is measured as the sum of the following items: savings in administrative costs, system growth, better alignment of products and services to the customer need, more effective coordination between the head office and outlets, reduction in costs, increase in yields, increase in innovation, savings in coordination and control costs, better quality of offered products, profit growth (Cronbach alpha α = 0.849).

Independent variables

In line with our analytical framework, we use the following independent variables.

MUF: the main variable of interest is a quantitative variable expressing the percentage of MUF (ratio between the number of franchised units divided by the number of franchisees). A similar ratio has been used in previous studies (Gomez et al., 2010; Griessmair et al., 2014).

Brand name (BN): consistent with Combs et al. (2004) and Barthélemy (2008), the brand name is measured on a seven-point Likert scale. The franchisors were asked to rate their chain on brand name

[3] Detailed results are available on request.

strength compared to competitors, brand recognition compared to competitors, reputation for quality, and the importance of the brand name for achieving competitive advantage; ($\alpha = 0.803$).

System-specific assets (SSA): consistent with Erramilli et al. (2002), this variable measures the difficulties of transferring the system knowledge from the franchisor to the franchisees. The franchisors were asked to rate the transfer to franchisees of brand name, marketing know-how, organizational know-how, quality management, accounting, and human resources know-how, on a seven-point Likert scale; ($\alpha = 0.915$).

Behavioral uncertainty (BU): adapted from Anderson (1985) and Mumdziev and Windsperger (2013), the franchisors were asked to rate the difficulty of measuring the outlet performance (the franchisee or manager), controlling their behavior, and assessing their competencies and capabilities on a seven-point Likert scale; ($\alpha = 0.768$).

Environmental uncertainty (EU): based on the works of Celly and Frazier (1996), and John and Weitz (1989), the franchisors were asked to rate fluctuations in outlet sales, the changes of the market environment, and the difficulty of predicting developments in the local market on a seven-point Likert scale; ($\alpha = 0.845$).

Descriptive Statistics

Table 1 reports the means, standard deviations, and correlations of the variables. As missing values may bias the estimations,[4] we chose to generate them using the multiple imputation method.[5] The low

[4] The missing values vary between 0.6% and 15.6% of the sample.

[5] The statistical theory suggests that using the method of averages to complete the missing data introduces bias in the value of the estimator and its variance. Rubin (1996) proposes multiple imputation as a solution. This method uses Monte Carlo simulations to replace the missing data from a number ($m > 1$) of simulations. In each simulation, the complete data matrix is analyzed using conventional statistical methods. Finally, the method combines the results to generate robust estimators. Thus, the multiple imputation method replaces missing values at random, and does not generate bias in the allocation of imputed values.

correlations between independent variables suggest no multicolinearity problem.

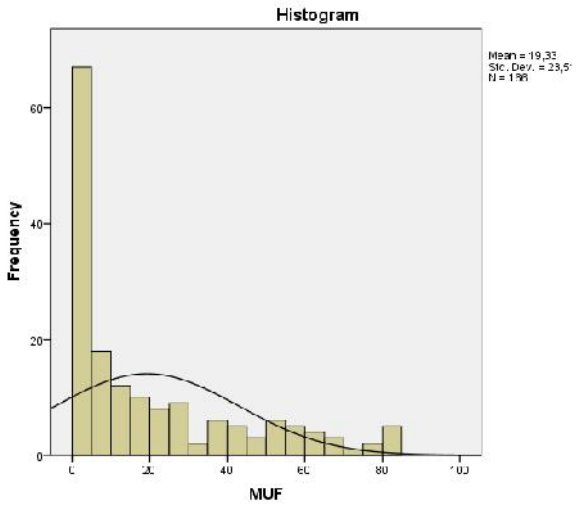
Table 1: Summary statistics and correlations

	Mean	SD	1	2	3	5	6	7
1. Chain performance	35.5177	7.36157	1					
2. MUF ratio	0.193	0.2351	0.342**	1				
3. Environmental uncertainty	7.633	3.324	-0.228**	-0.264**	1			
5. System-specific assets	29.122	10.477	0.401**	0.256**	-0.011	1		
6. Brand name	22.566	4.413	0.376**	0.225*	-0.055	0.112	1	
7. Behavioral uncertainty	6.5489	2.89779	0.283**	0.274**	-0.011	0.371**	0.157*	1

Note: SD = Standard Deviation; * significant at the 10% level, ** at the 5% level, *** at the 1% level.

Descriptive statistics regarding the MUF variable show that 106 (resp. 60) of the sample chains use (resp. do not use) this governance structure. The average MUF-ratio for the whole sample (MUF and SUF chains; 166 chains) is 19% (with SD = 0.24). Figure 2 presents the distribution of MUF-ratios in the sample (%). We can see that most of the chains use less than 20% of MU-Franchisees among their franchised-units.

Figure 2: Distribution of MUF-ratios in the sample



Estimation strategy

Using MUF is a strategic decision, taken non-randomly by the franchisor. For this reason, studying MUF as an explanatory variable of performance raises potential problems of endogeneity and selection bias, as previously emphasized by Masten (1996), Hamilton and Nickerson (2003), Saussier and Yvrande-Billon (2004), or Chaudey and Fadairo (2010). To test for potential bias, we perform a first set of estimations using the Heckman method. Full results are available in the online Appendix.

After these robustness checks, we develop a three-dimensional empirical analysis of the joint influence of MUF and contextual variables on chain performance. To do so, we run additive regressions. This nonparametric estimation method is designed to avoid any specific assumption about the residues. Instead of a single coefficient for each variable in the model, a non-parametric function is estimated to achieve the best prediction of the dependent variable values. Additive regression specifies the mean of the response variable as the sum of these functions.[6]

To test the relevance of the estimation strategy, we performed an analysis of deviance by means of $\chi 2$ tests for linearity, comparing each additive model with its linear version. Such tests for linearity showed that, in all the cases, the difference is highly statistically significant, which means that the additive nonparametric regressions provide a more accurate estimate of the relationship between chain performance and the independent variables than a linear regression.

In the following, we present first the estimation results of models with interactive terms, and then a graphical analysis based on three-dimensional perspective plots. All the estimations and perspective plots are generated with the software R.

RESULTS

[6] For details see Hastie and Tibshirani (1990), Schimek (2000).

Models with interactive terms

In line with the interactive framework developed (see Figure 1), we estimate additive models enclosing interactive terms, that is, for each model, the interaction of MUF – expressed as a percentage – with a contextual variable (models 1-4 in Table 2). The estimates are based on the tensor product method. For each independent variable, Table 2 presents first the smooth term, which cannot be directly interpreted (e.g., 7. 949 for MUF (%) in model 1); second, the result of the Fisher's test regarding the smooth term. The test indicates whether the effect of the independent variable on chain performance is significant or not (e.g., 3.473*** for MUF (%) in model 1).

Table 2. Non-parametric additive models with interactive structure

Chain performance	Model 1	Model 2	Model 3	Model 4
MUF(%)	7.949 3.473***	5.56 1.254	7.64 2.467**	5.397 2.375**
Environmental uncertainty	6.946 3.005***			
System-specific assets		5.328 4.617***		
Brand name			5.827 3.832***	
Behavioral uncertainty				1.609 0.716
Interaction				
Constant	**9.8** **4.843***** 34.7724*** (0.5081)	**8.601** **2.626***** 34.7161*** (0.5022)	**4** **2.259*** 35.0694*** (0.6147)	**7.782** **2.499***** 34.9335*** (0.5188)
N	166	166	166	166
R^2	44.5	47	36.5	30.1
AIC	1061.467	1049.615	1077.818	1091.41
Freedom	25.69	20.49	18.47	15.79

Notes:

Estimates based on the tensor product method. The smooth terms cannot be directly interpreted.

* Significant at the 10% level, ** at the 5% level, *** at the 1% level. Standard errors are in brackets.

Interactive term, (MUF × contextual variable): (MUF × EU) in model 1, (MUF × SSA) in model 2, (MUF × BN) in model 3, and (MUF × BU) in model 4.

The good global significance of the estimations is underlined by the R^2, which are quite high for cross-sectional data (between 30.1% and 47%). As predicted, the interaction of MUF with the contextual variables has a significant impact on chain performance. It is interesting to note that BU, in model 4, has no significant impact on chain performance when taken in isolation, while the association of MUF and BU (interactive variable) exhibits a clear and significant positive impact, providing support to the interactive framework. This is also the case for MUF in model 2; this variable has no significant direct impact, while the interaction of MUF and SSA significantly amplifies chain performance.

These results provide support for the analytical framework: the influence of the strategic choice, i.e. the percentage of MUF in the chain, is context-dependent. More precisely, we find evidence that the effect of MUF depends on the uncertainty levels affecting the chain, and on the key resources controlled by the chain (brand name and system specific assets).

Three-dimensional perspective plots

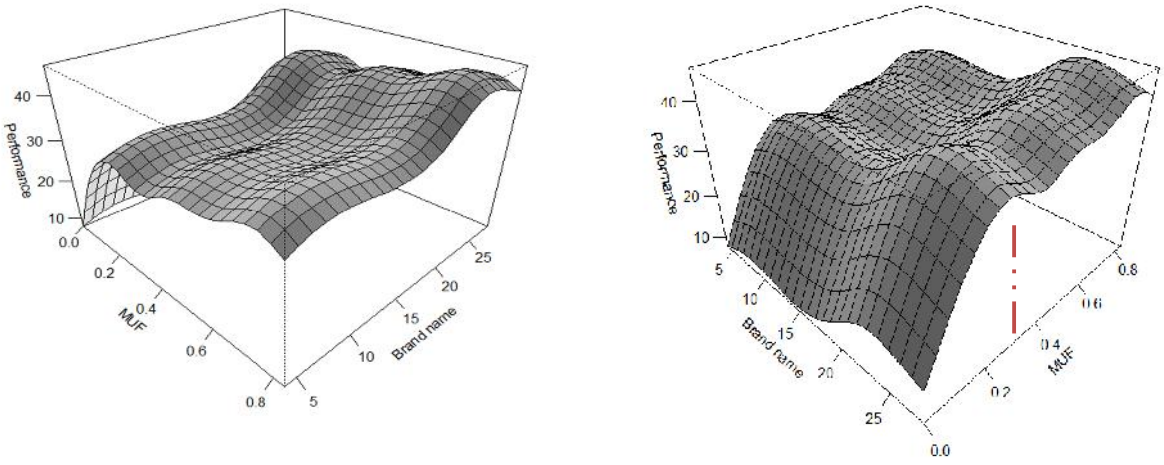
To better explain the form of the interactions reported in the additive regression analysis, we then generate and scan three-dimensional perspective plots (see Figure 2, 3, 4, 5). These are the fitted surfaces of the nonparametric additive regressions presented in Appendix 1. For each plot, the slices of the surface in the direction of MUF (i.e., holding the contextual variable constant at various values) are all parallel. Similarly, the slices in the direction of the contextual variable (holding MUF constant) are parallel, which allows for interpretation.

All the perspective plots – except (Figure 3) – highlight a relationship of both MUF and each contextual variable on chain performance. This result provides empirical support to our interactive analytical framework. We see that the relationships are not linear, as the perspective plots consist of

a set of curves *versus* lines. Consequently, the hypotheses we built can be confirmed (or rejected) on a specific interval of the explanatory variable, but not necessarily on another interval.

Regarding H1, Figures (2a) and (2b) underline three main results: 1) the governance structure (i.e. the MUF level) has a more decisive impact on chain performance than the brand name (BN) (horizontal curves on b); 2) increasing the MUF proportion for a given level of BN leads to higher chain performance, up to a certain threshold. There is an optimal MUF level, i.e. a "right mix" of MUF and SUF enabling one to reach the highest performance level; 3) this optimal MUF level, however, depends on the brand name value (for example, the graph shows that with a very high value of brand name, i.e. 28, the highest value of brand name on the Likert scale, the optimal MUF proportion reaches 45%).

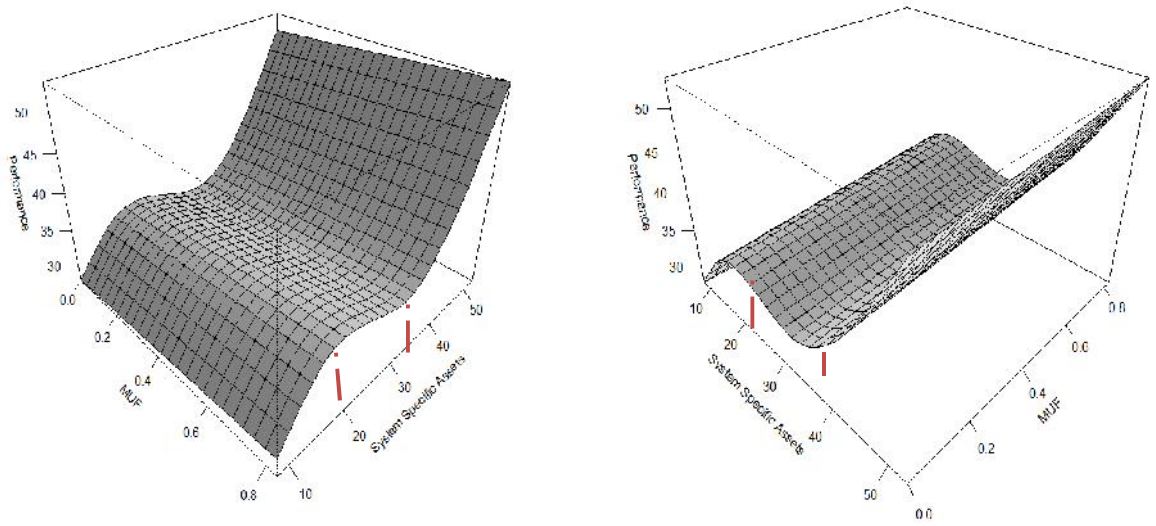
Figure 2. Brand name, MUF and performance



(2a) (2b)

Perspective plots linking brand name, MUF and performance (H1)

Figure 3. System-specific assets, MUF, and performance

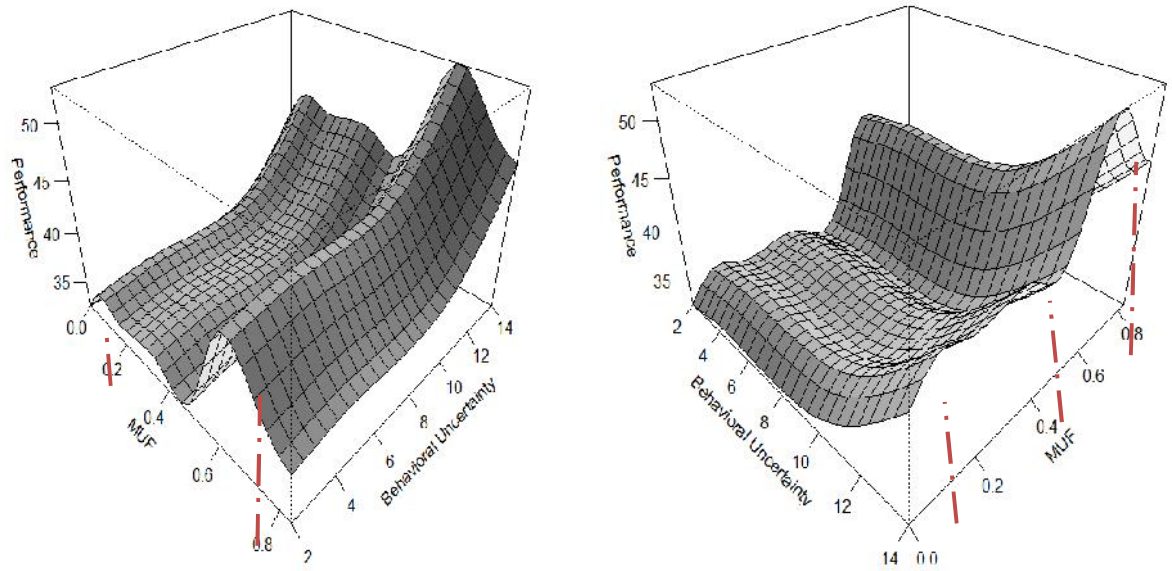


(3a) (3b)

Perspective plots linking system-specific assets, MUF, and performance (H2)

Regarding H2, Figures (3a) and (3b) address the influence of SSA and MUF on chain performance. In this specific case, MUF level has a very limited effect on performance, while SSA positively impacts the performance. This result is robust: in all the models including the SSA variable (models 2 and 6), the impact of MUF is not significant. Put differently, the value of the business concept has a higher impact on the chain performance than the governance structure. Moreover, for a given level of SSA, playing on the MUF level does not significantly amplify the chain performance.

Figure 4. Behavioral Uncertainty, MUF, and performance

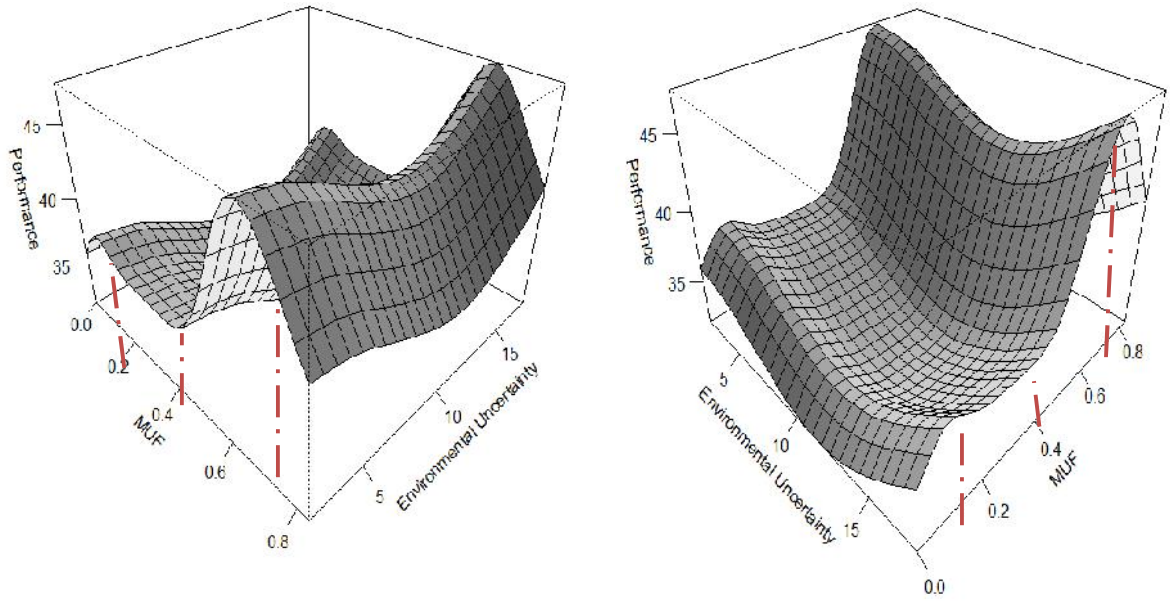


(4a) (4b)

Perspective plots linking behavioral uncertainty, MUF, and performance (H3)

The estimation results plotted in Figures (4a) and (4b) relate to the influence of behavioral uncertainty (BU) and MUF on chain performance (H3). The shape of these figures confirms the interactive framework: for a given level of BU, changing the proportion of MUF in the chain modifies chain performance. In addition, while hypothesis 3 predicts a balancing impact of the interaction of BU and MUF on chain performance, the perspective plots on the contrary indicate that there are waves, i.e. a succession of increasing and decreasing phases regarding the influence of MUF, in a set context of BU, on performance. The first stage relates to the interval between 0% and 10% of MUF, with an increasing effect on performance. The interval between 10% and 40% of MUF looks like a stagnation phase where a higher level of MUF does not change chain performance. The third phase (between 40% and 70% of MUF) is another catalytic phase: increasing the percentage of MUF among franchised-units amplifies chain performance. Finally, beyond 70% of MUF, any additional MU-Franchisee damages chain performance. The impact of the interaction of MUF and BU on the chain performance thus follows cycles.

Figure 5. Environmental Uncertainty, MUF, and performance



(5a) (5b)

Perspective plots linking environmental uncertainty and performance (H4)

A similar conclusion can be drawn for the three-dimensional perspective plots (5a), and (5b) (Figure 5) relating to H4. Here again, the figures highlight the existence of cycles regarding the impact of MUF on performance, depending on the environmental uncertainty (EU). More precisely, below 10% of MUF, increasing MU-Franchisees in the chain improves the performance (EU being constant). Between 10% and 50% of MUF, any modification of the governance structure has no significant influence on chain performance. On the 50% to 70% interval, allowing the opening of new MU-franchisees boosts chain performance, whereas beyond 70% more MUF is detrimental to the chain.

To sum up, H1 (i.e. the positive impact of MUF × BN on chain performance) is validated on the [0%-30%] MUF interval. H2 is also confirmed, even if the performance surplus triggered by higher MUF levels is of limited scope. The findings provide evidence on the joint influence of SSA and MUF on chain performance (Table 2), but the graphical analysis reveals that the MUF impact

is not a determining one. Regarding H3 and H4, we predicted a balancing effect of the interactive variables (MUF × BH and MUF × EU) on chain performance, due to both a positive and a negative influence on chain performance. The perspective plots clearly highlight those exacerbating and nuancing effects. However, contrary to our predictions, they do not mitigate each other but rather follow each other, generating thus a succession of waves.

DISCUSSION AND IMPLICATIONS

Findings

Previous research has not addressed the question of the "right mix" of MUF and SUF in franchise chains. Starting from this gap, this study analyses the impact of MUF-SUF mix on the performance of franchise chains under different contexts (in terms of chain-specific resources and uncertainty). Based on transaction cost theory, agency theory, and resource-based theory perspectives, we develop a new framework to explain the impact of MUF on chain performance. Using primary data from the German and Swiss franchise sector, we find evidence that the interaction of MUF and the contextual variables (brand name value, system specific assets, behavioral, and environmental uncertainty) do impact chain performance. In particular, non-parametric estimations highlight thresholds from which the performance effect stabilizes (e.g., in the case of brand name the threshold is about 30% of MUF), or even becomes reverted. When dealing with behavioral and environmental uncertainty, the effect of MUF on performance appears cyclical, depending on the MUF level.

In conclusion, the strategic choice of the right mix between MUF and SUF in franchise chains appears to be a complex organizational design problem. Our empirical results suggest that a mix of MUF and SUF is a more efficient governance structure than a pure MUF or SUF chain. Yet, by finding that the MU-franchisees proportion has a non-linear effect on chain performance, the present study does not exhibit an optimal MUF-SUF mix for all chains. On the contrary, we provide strong evidence that designing the best governance structure requires taking into account the chain-specific contingency factors, such as brand name value, system-specific knowhow, and the uncertainty level

faced by the chain.

Implications

This study has important implications for both researchers and franchisors. We contribute to the relevant literature by presenting a more nuanced understanding of the relationship between governance structure of franchise chains and performance outcomes. Specifically, we add to franchising literature first by corroborating prior research on the existence and influence of a "right" governance structure on chain performance. Indeed, we provide strong evidence that the alignment of resources and uncertainty on the one hand, and governance structure on the other, explains performance at the chain level. Whereas using a linear model of analysis would have led to the conclusion that no clear-cut effect of MUF on chain performance exists, our interactive approach highlights that the relationship is contingent on chain-specific resources and uncertainties at stake. We thus add to research on MUF versus SUF by showing that chain performance is explained by the fit between governance structure (in terms of MUF level) and context.

Second, we open new research avenues by focusing on the moderating impact of MUF on chain performance and highlighting its complex nature. While previous literature reported the percentage of franchised outlets as a potential barrier to performance (Barthélémy, 2008), we find in this study that the type of franchising (MUF *versus* SUF) might nuance the catalytic impact of some types of uncertainty or exacerbate the beneficial impact of some resources. Our empirical results highlight thresholds suggesting that a mix of MUF and SUF is a more efficient governance structure than a pure MUF or SUF chain.

This paper also provides insights into the management of franchise chains. When the franchisor seeks an efficient governance structure for the chain, she has to consider that the right MUF-SUF mix depends on the contextual factors of the chain, such as brand name, system-specific knowhow, and uncertainty. Increasing the MUF level might provide diminishing benefits to the chain, for instance under very high environmental uncertainty levels. Hence, "overMUFing", where a new

franchisee is allowed to run several units, might lead to a decrease in chain performance. Consequently, when deciding whether to allow MU-franchised units, franchisors should consider that *greater* is not necessarily *better*. Franchisors should look at their chain-specific characteristics to determine the target mix of MU-franchised outlets. Since the optimal mix depends on the contextual factors, franchisors have to closely monitor their contexts so as to be able to cut back on MUF if needed. Yet, modifying the MUF level within a given chain requires time and contractual changes, whereas contexts may rapidly evolve. Such a temporary misalignment (between the governance structure and the context) might explain franchise failures. Lastly, our study suggests a potential trade-off between investing in brand name and system-specific knowhow on the one hand, and responding to uncertainties by modifying the chain governance structure (i.e. changing the MUF-SUF mix) on the other. This enlarges the franchisors' portfolio of strategic options to maintain or increase their financial outcomes. However, due to the existence of cycles regarding the effects of the governance structure on performance, it is difficult to derive more general practical implications.

Limitations and future research

Important limitations of the study have to be acknowledged. First, the data do not allow us to differentiate between area development versus sequential MUF. Hence we could not examine the performance differences between the two forms. Second, in this study, the performance measurement is based on subjective indicators. While objective measures have greater validity, most of the franchise systems in this survey do not disclose financial data. Although the literature has demonstrated that there is a strong positive correlation between objective and subjective performance indicators (e.g. Crook et al., 2008), future studies could test the model by using both subjective and objective performance indicators. Third, we do not take the industry into account. One key issue for future research might be to understand the industry-specific determinants of the turning points generating the cycles revealed by our empirical work. Finally, in addition to the mix between MUF and SUF, the relationship between MUF and the proportion of company-owned outlets may also

influence chain performance. The franchisor's decision rights are more diluted under MUF than under SUF, because she transfers more local decision management rights to the multi-unit franchisees. The franchisor may compensate for the dilution of decision rights under MUF by an increase of control through more company-owned outlets. Consequently, future research should investigate the relationship between the right MUF-SUF mix and the proportion of company-owned outlets, and its performance outcome.

CONCLUSION

An efficient governance structure for a franchise chain requires a "right mix" of MUF and SUF. Based on data from the German and Swiss franchise sectors, the results of the study indicate that a mix of MUF and SUF is a more efficient governance structure than a pure MUF or SUF form. Specifically, our study provides evidence of a potential trade-off between investing in brand name and system-specific knowhow, and responding to uncertainties by modifying the chain governance structure (i.e. changing the MUF-SUF mix). While the positive performance effect of MUF is amplified in the case of strong brand name and system-specific knowhow, this effect might become negative and/or cyclical beyond a certain level of MUF and uncertainty. Consequently, finding the right mix of MUF and SUF, while taking advantage of existing resources under uncertainty, is an important issue in the strategic design of franchise chains.

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Appendix 1

While parametric methods estimate the slope of linear relationships between independent and dependent variables – this slope being supposed to be the same whatever the level of the independent variable – nonparametric estimations provide more complex information. Thus, Table 3 reports four pieces of information for each independent variable (e.g., MUF% in model 5): First, the smooth term of the partial-regression function (e.g., 7.289); second, the result of the Fisher's test regarding this smooth term (e.g., 4.711***); third, the type of relationship between the independent variable and the performance, that is, decreasing (DR) or increasing (IR); finally, the point (i.e., the level of the independent variable) from which the influence does not significantly differ from zero; for example, IR: 0.25 regarding MUF in model (5). As MUF is expressed as a percentage, this specific result means that the higher the percentage of MUF in the chain, the higher the performance (IR), as long as the percentage of MUF in the chain is below 25%. The point from which the effect of the explanatory variable is null is derived from the partial-regression functions (see Appendix 2).

Table 3. Additive models used to generate the three dimensional plots

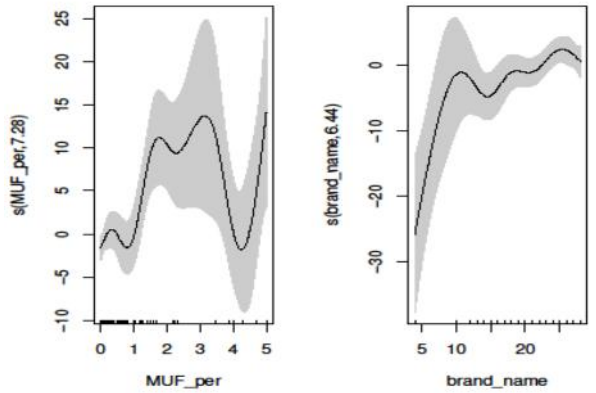
	Model 5	Model 6	Model 7	Model 8
MUF(%)	7.28 9 4.71 1***	1.254 1.459 IR:0.833	7.278 5.024*** IR: 0.55	6.743 3.502*** IR:0.667
Environmental uncertainty	3.005 1.973 DR: 6			
System-specific assets		4.331 13.05*** IR: 38		
Brand name			6.445 4.532*** IR: 20	
Behavioral uncertainty				1.861 2.296** IR: 8.23
Constant	0.0283068*** (0.0004603)	35.5177*** (0.4536)	35.5177*** (0.4661)	35.5177*** (0.5046)
N	166	166	166	166
R2	23.6	37	33.5	22
AIC	1135.809	1065.686	1082.259	1103.931
Freedom	11.29	6.58	14.72	9.6
	7870.424***	1645.709***	1689.136***	1083.395***

Significant at the 10% level, ** at the 5% level, *** at the 1% level. DR: Decreasing effect. IR: Increasing effect.

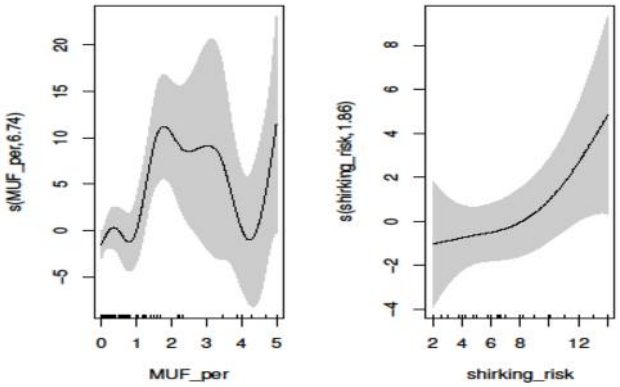
Appendix 2

Partial-regression functions for additive nonparametric models 5-8

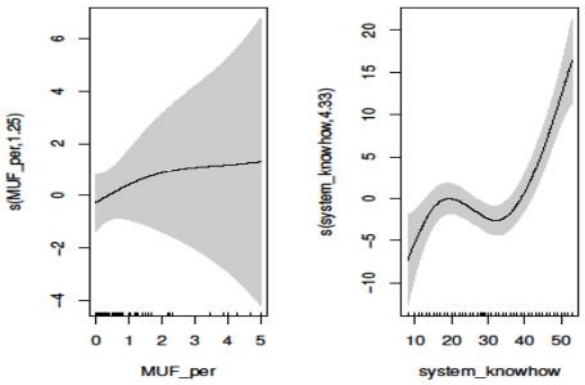
The points in each graph are partial residuals for the corresponding predictor, removing the effect of the other predictor. The gray area gives point-wise 95% confidence envelopes around the fit.



(a)



(c)



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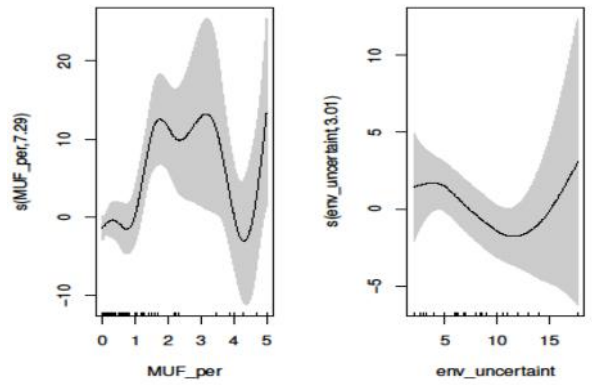

(b)