MISFITS IN ORGANIZATION DESIGN

INFORMATION PROCESSING AS A COMPENSATORY MECHANISM

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Abstract: We propose a compensatory misfits theory which holds that an "over-fitting" organization structure can compensate for an "under-fitting" structure, thereby reducing the total misfit. In organizations, over-fit occurs when structural features misfit the core contingencies because the structural level is too high to fit the contingencies. An under-fit occurs when structural features misfit the contingencies because the structural level is too low. When an under-fit is compensated by an over-fit, the combination can produce performance outcomes that approximate those from fit. The reason inheres in information processing being a higher level factor that cuts across different contingencies and structural features that are mis-fitted to each other, so that compensation is possible. We identify the specific conditions that must be fulfilled for compensation to occur, and we discuss implications for organization design theory and practice.

Keywords: Over-fit; under-fit; misfit; fit; compensatory misfits; compensatory effect; contingency theory; information processing

Organization design follows the idea that the best design for an organization is one that fits its situation (Donaldson, 2001). Achieving fit means aligning organizational features to contingency factors such as uncertainty (Burns & Stalker, 1961; Lawrence & Lorsch, 1967), strategy (Miles & Snow, 1978; Rumelt, 1974), and size (Child, 1975). The resulting design will be the best in the sense that it will allow the organization to meet its goals, including that of high performance. The emphasis in organization design, therefore, is on identifying misfits and changing them into fits. We suggest, however, that sometimes misfits may produce outcomes that begin to approach the same positive outcomes as fits. Furthermore, it may be better to retain misfits rather than change them into fits because changing the organization's design may incur substantial costs. Such "beneficial" misfits only occur in certain situations, and we identify them in this conceptual article.

Our compensatory misfits theory is based on the information processing perspective which has long served as the theoretical foundation of organization design (Galbraith, 1974). Contingencies are viewed as the information-processing requirement, while organization structure is viewed as the information-processing capacity to meet that requirement (Burton, Lauridsen, & Obel, 2002, 2003; Egelhoff, 1991; Keller, 1994; Tushman & Nadler, 1978). When information-processing capacity matches the information-processing requirement, there is a fit. Otherwise, if information-processing capacity is not equal to the information-processing requirement, there is a misfit. Under-fit occurs when information-processing capacity provided by the structure is lower than the information-processing requirement of the contingency. In contrast, over-fit occurs when information-processing capacity exceeds the information-processing requirement. Our compensatory misfits theory adopts the information processing perspective in identifying fits, misfits, and interactions among misfits. The theory posits that the excess information-processing capacity of the over-fit may

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be used to compensate for the deficiency in information processing capacity of the under-fit.

Our article proceeds as follows. The next section positions compensatory misfits theory within the structural contingency theory tradition. Following that, we discuss the notion of compensatory information-processing mechanisms. Third, we discuss the simultaneous occurrence of over-fit and under-fit, along with non-routine information processing and its costs, as they pertain to compensatory misfits theory. Fourth, we discuss the implications of our proposed theory for organization design theory and practice. The final section presents our conclusion.

STRUCTURAL CONTINGENCY THEORY

Organization structure has long been an important topic in management and organization research (Donaldson, 1987; Doty, Glick, & Huber, 1993; Meyer & Rowan, 1977; Perrow, 1967; Rumelt, 1974). Structure continues to enjoy popularity in the recent literature and is a major focus of managers and consultants who design and redesign organizations (Birkinshaw, Nobel, & Ridderstrale, 2002; Burton, DeSanctis, & Obel, 2006; Gulati & Puranam, 2009; Siggelkow, 2002; Siggelkow & Rivkin, 2005; Turner & Makhija, 2012; Wasserman, 2008). One influential approach for examining the design of organization structures is structural contingency theory (Burns & Stalker, 1961; Donaldson, 2001; Lawrence & Lorsch, 1967; Thompson, 1967). The core idea is that to design a high-performing organization, structure needs to fit key contingencies such as uncertainty, strategy, and size. Misfits between an organization's structure and its contingencies lead to performance loss. For example, a major contingency of structure is environmental uncertainty. In an uncertain environment, organization structure needs to be "organic" to be in fit, in order to be flexible enough to innovate, while in a stable environment it needs to be "mechanistic" to be in fit, to ensure efficiency (Burns & Stalker, 1961).

Misfits occur when the actual structural level is different from the structural level which fits the contingency level. There are two types of misfits: over-fit and under-fit (Klaas & Donaldson, 2009; Klaas, Lauridsen, & Håkonsson, 2006; Naman & Slevin, 1993). Over-fit is where a structural level is higher than the ideal amount required by the contingency variable. Under-fit is where a structural level is lower than the ideal amount required by the contingency variable. Considered independently, both over-fit and under-fit have negative effects on performance.

COMPENSATORY INFORMATION-PROCESSING MECHANISMS

The key idea of compensatory misfits theory is that *under certain conditions an over-fit can compensate for an under-fit*. The excess resources from the over-fit make up for the deficiency of resources in the under-fit. This can occur when the resources provided by both misfits are substitutes for each other. Such a condition holds where information processing serves as the primary mechanism for achieving overall fit. That is, the contingencies taken together represent the organization's need to conduct information processing, and the structural variables taken together provide information-processing capacity. The excess information-processing capacity of the over-fit substitutes for the deficient information-processing capacity of the under-fit. In this way, an over-fit can compensate for an under-fit. However, the compensation can only occur when the over-fitting structure can provide non-routine information processing. Thus, the three conditions that must be met simultaneously for compensation to occur are: (1) the simultaneous presence in an organization of both an over-fitting and an under-fitting structural variable; (2) each structural variable contributes to information-processing capacity; and (3) the over-fitting structural variable can contribute to non-routine information processing. Pairs of misfits that meet all three conditions produce superior performance outcomes to those produced by two over-fits or two under-fits. Moreover, an organization in misfit might do better to retain the under-fit and over-fit, rather than change them into two fits, because of the costs such reorganization might incur. Lastly, although the three conditions tend to reduce the occurrence of compensation, another consideration tends to increase the occurrence of compensation. That is, compensation holds not only for misfits

to the same contingency variable but also for misfits to different contingency variables, so long as both structural variables are involved in information processing.

If over-fit and under-fit are simultaneously present in an organization, the possibility comes into view that the over-fit may compensate for the under-fit. Here the two misfits jointly produce positive outcomes that are approximately the same as the outcomes produced by two fits. The reason the possibility of compensation exists inheres in information processing being a higher level factor that cuts across different contingencies and structural variables involved in misfits (Galbraith, 1974, 1977; Klaas & Donaldson, 2009; Klaas et al., 2006; Tushman & Nadler, 1978). According to Galbraith (1977: 53), the information-processing structures and their capacities "are added to the organization's repertoire." In this sense, the structural variables can satisfy the information-processing requirement of the contingency *collectively* rather than separately. Klaas et al. (2006) discuss how several different structures can contribute to the overall information-processing capacity of the organization. Likewise, numerous contingency variables could all contribute to the demand for information processing in the organization. For example, high task uncertainty requires more generation and analysis of decision options, while a strategy of diversification adds complexity from dealing with different products or markets, so that both contingencies contribute to the information-processing demand on the organization. Thus, the fit of the structures to the contingencies is the fit of the structures taken together to the fit of the contingencies taken together. Hence, the information-processing capacities of multiple structural variables should be considered as a whole as to their fit to the information-processing requirement of the contingencies as a whole. This implies that the over-fit of one structural variable and the under-fit of another should be taken into account jointly in terms of information-processing capacity.

As shown in Figure 1, the over-fit (S_1 is greater than C_1 in the left side of Figure 1) has more than enough information-processing capacity, which opens the door for the compensation of information-processing capacity by this over-fit. Such compensation can only occur, however, when there is also an under-fit (S_2 is less than C_2 in the right side of Figure 1) that has insufficient information-processing capacity, so that the organization is in a position to use the extra information-processing capacity of the over-fit. In other words, when a structural variable is in under-fit, the *extra* information-processing capacity of the over-fit of another structural variable can be beneficial.

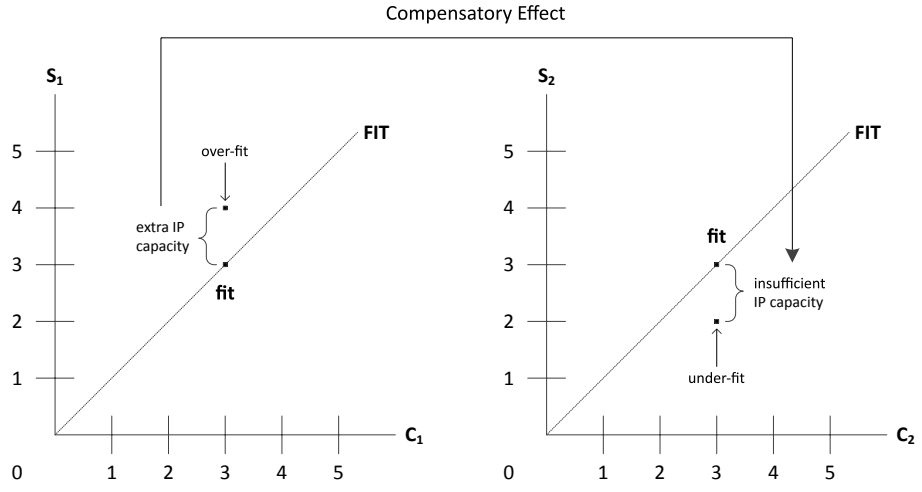

Fig. 1. Compensatory Effect of Over-fit on Under-fit

If one structural variable is in under-fit, then this structural variable has insufficient information-processing capacity and is unable to fully meet the information-processing requirement of its contingency. In this case, the structural variable (S_2) that under-fits its contingency (C_2) processes some information but leaves some information unprocessed. The structural variable (S_1) that over-fits its contingency (C_1) uses its extra information-processing capacity to process that information, so all information gets processed. The extra information-processing capacity of the over-fit (S_1) does not directly strengthen the information-processing capacity of the structural variable that is in under-fit (S_2). Rather,

the extra capacity of the over-fit (S_1) is utilized as a supplement to the structural variable in under-fit (S_2) to process the information that the under-fit cannot process. We illustrate this point in the example below of how over-fit in occupational specialization compensates under-fit in formalization.

The extra capacity of the over-fit is a "waste" when there is no under-fit requiring compensation. The extra capacity of over-fit easily appears to be a waste when it is considered in isolation from the under-fit it compensates. However, when both over-fit and under-fit are present together, the extra capacity of the over-fit increases the overall benefit from the combination of over-fit and under-fit. To illustrate, the contingency variable of task uncertainty imposes certain information-processing requirements on both of the two structural variables of formalization and occupational specialization (Hage, 1965, 1980). For both structural variables, there is a level that fits the organization's level of task uncertainty and other levels that misfit it. Suppose that Alpha Company is a U.S. electronics manufacturer with a plant in Mexico that employs non-English speaking workers who need to be guided by clear rules and standard operating procedures (i.e., high structural formalization) given the repetitiveness of their work (i.e., there is low task uncertainty). Even though there are rules and standard operating procedures, however, they are not enough to thoroughly guide the workers; the workers are sometimes unsure of what to do next and lack the information that would provide valid guidance. Here, formalization under-fits task uncertainty. Nevertheless, these employees are well-educated and work in a structure of high occupational specialization in which they develop knowledge about effective work practices. The degree of occupational specialization exceeds that required by the level of task uncertainty; this variable is in over-fit. The specialists educate their colleagues about effective work practices. They know the best ways to run each of the machines and can communicate this information among themselves. In this way, the extra occupational specialization compensates for the insufficient formalization, so that the deficiency stemming from the too low formalization is overcome. The information-processing capacity of the combined structural variables meets that required by the task uncertainty, resulting in overall fit.

In such cases, the overall benefit of the combination of one over-fit and one under-fit is greater than the sum of the individual benefits of these two misfits. The combination of one over-fit and one under-fit collectively achieves much of the level of benefit as the combination of two fits, since the former combination is able to satisfy the same total information-processing requirement as those two fits. Thus, theoretically, the two misfits of over-fit and under-fit interact in the way they affect organizational performance rather than both having independent, negative effects on performance.

SIMULTANEOUS OCCURRENCE OF OVER-FIT AND UNDER-FIT, AND NON-ROUTINE INFORMATION PROCESSING AND ITS COSTS

For compensatory misfits theory to apply, there has to be more than one misfit present in the organization, but this can occur in several ways. First, more than one structural variable can be contingent on a particular contingency factor (Burns & Stalker, 1961; Donaldson, 2001; Hage, 1980). For example, the size contingency can be mis-fitted by both decentralization and formalization. It is possible that one of those structural variables over-fits the contingency factor while another under-fits the same contingency factor. Second, a structural variable may have a misfit to more than one contingency variable simultaneously (Burton et al., 2002, 2003; Donaldson, 2001; Gresov, 1989, 1990). For example, formalization can misfit uncertainty and size. It is possible that the structural variable over-fits one contingency factor while under-fitting the other contingency factor. Third, a structural variable could under-fit a contingency variable while a different structural variable over-fits another contingency variable. Thus, theoretically, there are several possible combinations of misfits between structures and contingencies because some contingencies are mis-fitted by multiple structures, some structures misfit multiple contingencies, and misfits need not share a structure or contingency to be compensatory. These various misfits create many potential situations where an over-fit and an under-fit could occur simultaneously.

Considering the organization from a dynamic perspective, the simultaneous occurrence of over-fit and under-fit is more likely when multiple contingencies are changing in different directions – for example, when some are declining and some are growing. According to Structural Adaptation to Regain Fit (SARFIT) theory (Donaldson, 1987, 2001), decline will tend to produce over-fits and growth will tend to produce under-fits. There are several contingencies that influence whether the organization declines or grows. For compensation to occur there needs to be simultaneously both a contingency causing decline, which creates over-fit, and another contingency causing growth, which creates under-fit. This would exist, for instance, if the organization was growing in size, making its existing formalization level an under-fit. Simultaneously, the organization might be in an environment that is becoming more certain, so the existing high decentralization that previously fitted the uncertain environment has become an over-fit. The over-fit could compensate for the lack of formalization by having managers lower in the hierarchy make decisions rather than relying on organizational rules. In sum, the multiple misfits that are possible between structures and contingencies increase the likelihood that there may be in an organization the combination of an over-fit and an under-fit, so that the over-fit provides the excess information-processing capacity that compensates for the deficiency from the under-fit. While simultaneous under-fits and over-fits may be a common occurrence in organizations, however, simultaneity alone is insufficient to create compensation between the misfits. An additional relevant variable is the routineness of information processing.

Over-fit can compensate for under-fit only if the over-fitting structure allows for non-routine information processing. The substitution between routine and non-routine information-processing capacities is a one-way rather than two-way path. On the one hand, non-routine information-processing systems are also capable of processing routine information (Egelhoff, 1991). For example, an autonomous team, a non-routine information-processing mechanism, is also able to perform ordinary, standardized work. Therefore, when this non-routine information-processing structure (i.e., the autonomous team) is in over-fit, part of its capacity can be used to process codified information about routine operations if there is insufficient processing capacity for routine information in the organization.

On the other hand, routine information-processing structures are not able to process non-routine information, so routine structures cannot substitute for non-routine structures (Egelhoff, 1991). For example, standard operating procedures are not flexible enough to deal with exceptional events. Hence, an over-fit of routine information-processing structures cannot provide extra information-processing capacity to the under-fit of non-routine information-processing structures.

The compensation of over-fit on under-fit also has cost implications. Routine information processing achieved by compensatory non-routine information-processing structures may not be as cost-effective as routine information-processing structures (Egelhoff, 1991). This higher cost is readily apparent in the example of using an autonomous work team, rather than less autonomous workers controlled by standard operating procedures, to conduct routine work. Investments made to increase the flexibility and capability of an autonomous work team are largely wasted in the standard day-to-day tasks.

In summary, the direction of the compensation of information-processing capacity can only be from non-routine to routine information-processing structures. Moreover, this compensation has higher costs compared with processing routine information using a routine information-processing structure. The total cost of one over-fit and one under-fit is thus greater than that of two fits, making the combination of over-fit and under-fit less optimal. However, as will be shown below, there are also costs associated with changing misfits to fits, so it may be rational to maintain the combination of over-fit and under-fit.

DISCUSSION AND IMPLICATIONS

The compensatory misfits theory proposed here needs empirical testing to ascertain its validity. If valid, the theory has several theoretical implications. First, it reveals the theoretical possibility of the compensation of information-processing capacity from over-fit to under-fit. The concept of compensation is in line with recent academic interest in organization design

elements and their effects on performance (Rivkin & Siggelkow, 2003, 2007; Van de Ven, Leung, Bechara, & Sun, 2012), and compensation appears to warrant further investigation concerning where it applies.

Second, the extra information-processing capacity of over-fit is analogous to organizational slack (Child, 1972; Tang & Peng, 2003) in that over-fit buffers the structure of the organization from needing always to change to fit the contingencies. However, whereas organizational slack often refers to surplus financial resources (Child, 1972), compensatory misfits refers to misfits between structures and their contingencies.

Third, the idea of compensatory misfits does not imply equifinality (Gresov & Drazin, 1997). We show that, due to the compensatory effect, the combination of over-fit and under-fit can possess the same level of information-processing capacity and therefore can realize the same performance benefits as two fits. However, in articulating the third condition of the compensatory effect, we also show that for a non-routine over-fitting structure to process routine information, the cost is higher than for a routine information-processing structure to process routine information. In this way, the combination of over-fit and under-fit incurs higher cost in information processing and so produces less performance than the combination of two fits. Hence, these two combinations are not equifinal in terms of performance. Our compensatory misfits theory is not the same as equifinality.

Fourth, we clarify the boundary of functional equivalence in information processing (Galbraith, 1977; Gresov & Drazin, 1997). We suggest that not all combinations of over-fit and under-fit provide the same amount of information processing. We show that the over-fit of a *non-routine* structural variable and the under-fit of a routine structural variable can produce superior performance over two misfits, whereas the over-fit of a routine structural variable and the under-fit of a structural variable cannot.

Fifth, the concept of compensatory misfits proposed here is distinguishable from the meaning of compensatory fit as used by Gulati and Puranam (2009). While both compensatory misfits and compensatory fit are concerned with the compensation between structural variables, these two terms have some distinctive theoretical properties. Compensatory misfits refers to the interactions between formal structural variables whereas compensatory fit is the interplay between formal and informal structures. Moreover, the focus of compensatory misfits is on how structural variables interact with the same function (information processing) while the focus of compensatory fit is on how the formal and informal structures achieve two conflicting yet desirable functional demands (cost-effectiveness and differentiation).

The compensatory misfits theory also has implications for existing empirical research findings. For instance, in the Burton, Lauridsen, and Obel (2002, 2003) study the additional misfits beyond the "bottleneck" (i.e., largest, single) misfit (Klaas et al., 2006) had no significant decrease in performance. That multiple misfits in organizations can have less reduction in performance than expected may be explained by compensatory misfits theory. That is, the remaining, relatively small misfits may include enough over-fits and under-fits that they tend to cancel out their effects on organizational performance. Future research could examine such results to see if multiple misfits in the same organization contain both under-fits and over-fits that are reducing performance loss.

The compensatory misfits theory also has several practical implications. Instead of eliminating over-fit, as according to the traditional view, organizational designers should sometimes maintain over-fit – or even create over-fit. The compensatory misfits theory suggests that compensation from the combination of over-fit and under-fit can create information processing that is more beneficial than that from two misfits. However, as seen above, the costs for information processing are higher than for two fits, because the over-fit has to provide non-routine information processing that is more costly than fits which provide routine information processing. Therefore, the combination of two fits remains more beneficial than the combination of an over-fit and an under-fit. Nevertheless, the costs of structural changes may sometimes render the maintenance of one over-fit and one under-fit organizationally rational.

There are costs involved in moving from the over-fit and under-fit condition to the condition of two fits. The exact level of the structural variable that fits the contingency(ies) may be unknown to the managers of an organization, so there are costs of deciding such as

obtaining experience and dealing with uncertainty – although these costs might be mitigated by using available design/redesign software like OrgCon (Burton & Obel, 2004). There are also costs of changing the organizational structure such as training, hiring, or terminating employees or redesigning support systems (Greve, 1999). Only if the additional performance from changing from over-fit and under-fit to two fits is greater than the costs of the change is it rational for an organization in over-fit and under-fit to change them to fits. Thus, depending upon the values of these performance and cost levels, it may be optimal for an organization to remain with the two compensatory misfits of over-fit and under-fit.

Going further, it may be rational for an organization to intentionally create over-fit. This is where the organization anticipates that in the future it will have an under-fit because an existing level of a structural variable will become a misfit to a new, higher level of a contingency (e.g., the organization is growing), so the existing level of formalization that fits the present size will become an under-fit). Here the creation of an over-fit of another structural variable proactively prepares for the future under-fit of the first structural variable. In this way, an organization can lessen the structural liability of growth (Stinchcombe, 1965). Organizations are able to increase their degree of overall fit and thus lose less performance in the long term.

In summary, compensatory misfits theory suggests that managers and organizational consultants should change their mindsets that all misfits are bad. They should be aware that over-fits can be valuable in the present and perhaps be an investment for the future. Therefore, maintaining or even creating over-fit can be a beneficial choice – especially when the organization is growing. Nevertheless, such beneficial over-fit can only be created in structural variables that contribute to non-routine information processing, such as in autonomous teams. In contrast, over-fit in routine structural variables, such as by having too many rules and standardized procedures, should still be avoided.

CONCLUSION

The compensatory misfits theory holds that the combination of one over-fit and one under-fit can perform better than traditionally expected from contingency theory due to the compensation of information-processing capacity from the over-fit to the under-fit. The compensation is possible because the demands for information processing posed by the contingencies collectively are met by the structural variables collectively. Nevertheless, the combination of an over-fit and an under-fit performs worse than the combination of two fits. This is because the over-fit will typically have to provide non-routine information processing which is more costly than an under-fit providing only routine information processing. Hence, the compensatory combination of an over-fit and an under-fit can perform better than two misfits but less than two fits. There are, however, costs of changing from the combination of an over-fit and an under-fit to two fits. Only if these costs are less than the superior performance from two fits will it be rational for an organization with a simultaneous over-fit and under-fit to change them into fits.

The conditions required for compensatory misfits theory to apply are restrictive: an under-fit and an over-fit should be maintained if their simultaneous presence provides compensating, non-routine information processing and if the change to two fits would be more costly than the benefits it adds. In these conditions, an organization should rationally retain compensatory misfits. Furthermore, an organization may create an over-fit in anticipation of a future under-fit for which the over-fit will compensate.

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