

What To Pay and How to Decide? A Fast and Frugal Tree Approach to Determining Compensation

Summary

Compensation decision-making in organizations is a complex process that requires balancing multiple, often conflicting, criteria such as internal equity, market alignment, budget constraints, and strategic priorities. Traditional compensation models rely on compensatory decision-making frameworks that assume rational trade-offs, but these models can be computationally demanding and impractical in fast-paced environments. This study introduces a Fast and Frugal Tree (FFT) model, a non-compensatory, lexicographic heuristic that allows for efficient, sequential decision-making using a limited set of key cues. The proposed model enhances ecological rationality by ensuring decisions remain parsimonious, transparent, and adaptable to dynamic organizational constraints. By integrating tolerance for uncertainty, this study advances a novel decision-making framework for HR professionals. The FFT approach has broader implications for recruitment, promotions, and trade union negotiations, providing an alternative to computationally intensive methods.

Track: Human Resource Management

Word Count: 2687

1.Introduction

Decision-making in compensation within organizations has given way to multiple models of directions to improve strategic alignment in terms of goals and aspirations. Within employment relations, a good compensation strategy has been crucial to attracting and retaining talent. Despite multiple detailed and often cumbersome models, organizations still struggle to make a simplistic decision about what to pay and how to decide objectively on it. A common misconception among academicians and practitioners alike is that the more complex the model is, the better will it perform. Hence, we see an uptick in big data models with a large number of free parameters. Nothing can be farther from the truth, especially in the case of decision models. It can be observed that in real-life scenarios, decision-makers opt to go for a single decision rule in most cases or rely on simple heuristics. Fast and frugal trees help us analyze and more so visualize sequential decision-making. The approach taken for the study is that of a deterministic, non-compensatory categorization approach i.e. $P_i(x)=1$ or $P_i(x)=0$. This is apt owing to the limited time, information or computational ability. The reason for this being deterministic is that the decision of compensation doesn't often present a perceptual behavior difference. The challenge often is regarding setting the priorities right by the human resource professional. A fast and frugal tree utilizes the process of categorization through cues and is an excellent method when working with limited data. The study presents a model of decision-making regarding compensation to provide professionals with a toolkit to make faster decisions in terms of compensation in the organization.

2.Fast and Frugal Trees

Fast and frugal trees find their origin in the theory of trees. The classification based on trees is quite prominent in machine learning and statistics. Any kind of categorization based on trees primarily serves two purposes: increasing the accuracy of prediction and avoiding noise (Myung et al., 2000). FFTs are a type of decision tree that allows for a decision at each node, making them lexicographic classifiers. They are designed to be simple, requiring minimal time, knowledge, and computation to make decisions (Luan et al., 2011). Etymologically, fast refers to the speed of the tree calculated through the mean number of basic operations- logical and Arithmetic. Similarly, the frugality of the tree refers to the mean number of cues used for categorization (Martignon et al., 2008). 3 important factors make the FFT stand out. Firstly, they are deterministic. Secondly, they don't quantify the response time in prediction but rather only qualitatively help in categorization. Thirdly the cues can be used only one at a time and two cues cannot be combined. Most importantly, FFTs have one exit possible at every level hence avoiding the splitting of trees. Fast-and-frugal trees (FFTs) are applied in decision-making for performance-based personnel decisions by nearly half of the college students and two-thirds of the experienced managers (Luan & Reb, 2017). An often-cited critique of fast and frugal trees (FFT) is that it is not directed towards optimality. The aspects that are not being considered are twofold- in real-life scenarios, decision-making is never optimal but rather almost always sub-optimal and also FFT's objective is to help in faster decision-making with limited information available. Big data models and other complex models face bias-variance decomposition of the prediction error which effectively means that when free parameters are used, the bias in the model decreases as it is the difference between the mean prediction and true mean value of population. Variance on the other hand depends on individual samples which therefore increases with new free parameters being added. What we see therefore is a trade-off that more complex models do.

3. Ecological Rationality and Compensation Decisions

Ecological rationality holds that cognitive processes, including heuristics, are not necessarily rational or irrational, but their success depends on their degree of fit to relevant environmental structures (Hertwig et al., 2021). Ecological rationality is a naturalized version of rationality for situations of intractability and uncertainty, focusing on heuristics that may violate axiomatic rationality and evaluating them based on predictive accuracy, frugality, and efficiency (Gigerenzer, 2019). Ecological rationality in fast-and-frugal heuristics focuses on deriving what agent's "ought" to do from ecologically rational actions (Hands, 2011). In such a case of compensation decision being made, the difference in the market, industry and internal dynamics of the organization makes it imperative that the decision need to be made keeping in mind the environmental constraints. Also, in organizations where the hiring is taking place in bulk either due to growth pressure or sudden exigencies, compensation decisions for incoming employees need to be made in a limited time. Compensation negotiations are generally short and employees observing the demand often ask for exorbitant salaries. To run complex computational models for determining compensation might become cumbersome, not to mention in a competitive market might lead to talent running to other organizations as compensation discussions were delayed or prolonged. The FFT discussed in later sections doesn't wish to discuss the nuances of what structures of compensation are to be provided but whether the demand for compensation by the candidate should be accommodated and confirmed by the HR professional.

4. Cue Selection and Properties

The proposed mathematical model for HR decision-making in compensation determination integrates various cues, market alignment, internal equity, budget feasibility, strategic prioritization, and future-proofing, into a unified decision framework. These cues are based on established theories and best practices in HR management, economics, and decision theory. This literature review synthesizes the relevant work on each of these cues, discussing their implications for compensation determination and how they contribute to the overall model.

4.1. Market Alignment (Cue 2)

The degree to which an organization's pay fits the going rates in the pertinent labour market is known as market alignment. A well accepted tenet in compensation management is that companies should pay competitive rates to draw and keep employees. This is consistent with the labour market dynamics-based market-driven perspective of pay (Gerhart & Milkovich, 1992). Different studies have shown that market-based pay systems enable companies to remain competitive in talent acquisition (Kochan et al., 1986; Milkowicz & Newman, 2008). The model uses the market alignment cue to see whether the suggested compensation C_r falls within a tolerance range around the median market salary M_r . Studies confirm that minor departures from market rates are reasonable if they serve other purposes, such strategic objectives or internal equity (O'Neill, 2010).

4.2. Internal Equity (Cue 1)

Internal equity is centred on making sure staff members in comparable positions receive just compensation inside the company. Maintaining organisational fairness and staff morale depends on it. Based on Adams's (1965) Equity Theory, which holds that people evaluate their inputs, e.g., abilities, experience, and outputs, pay, relatively to others. When employees find these

comparisons fair, they become motivated. Compensation that strays too far from internal equity norms could cause discontent, more turnover, and lower productivity (Rynes, 2004). The suggested model makes sure C_r stays within a reasonable range in relation to comparable positions in the company by means of an internal equity benchmark E_r . Studies reveal that this strategy helps reduce negative consequences linked with perceived inequality (Bies & Moag, 1986).

4.3. Budget Feasibility (Cue 3)

Any process of compensation decision-making depends critically on budget feasibility. Many times, organisations have financial limitations that restrict the degree to which they can pay competitive salaries. While remuneration should be competitive, economic theories of compensation, such as agency theory, suggest that it also must fit organisational resource availability (Jensen & Meckling, 1976). Research in compensation management show that preserving organisational sustainability and avoiding fiscal inefficiencies depend on matching remuneration with budgetary restrictions (Lazear, 1986). The budget feasibility cue of the model helps to determine whether the suggested compensation C_r falls inside the organisational budget B , therefore stressing the need of financial control in pay policies.

4.4. Strategic Prioritization (Cue 4)

Strategic prioritising recognises that some positions inside the company are more vital for its long-term survival and could call for more pay to reflect their strategic relevance. This concept stems from strategic human resource management (SHRM) ideas, which hold that pay should line up with strategic objectives of a company (Becker & Huselid, 2006). Compensation for jobs directly affecting their competitive advantage is generally given top priority in highly successful companies (Snell & Dean, 1992). The suggested model uses a strategic relevance factor F_s to change pay for positions with more strategic value. This strategy maximises talent retention and strategic success by complementing studies endorsing varied remuneration policies for important roles (Gerhart & Rynes, 2003).

4.5. Future-Proofing (Cue 5)

Future-proofing in pay-off decisions takes future economic conditions and predicted market movements into account. Rapid changes in the employment market, especially resulting from technology developments and changing economic environments, make it imperative to make sure that pay plans are still relevant and viable going forward. Future-proofing is based on forecasts and labour market projections that imply compensation policies ought to be flexible enough to accommodate future uncertainty (Brynjolfsson & McAfee, 2014). The suggested model adjusts compensation C_r depending on expected changes in the labour market by including the estimated future market trend P_r . Studies on compensation and labour market projections show that matching pay with future market conditions helps companies stay competitive and avoid salary inequalities developing over time (Dube et al., 2017).

6. Heuristic Decision-Making and the Fast and Frugal Tree (FFT)

The Fast and Frugal Tree (FFT) heuristic used in the model simplifies the decision-making process by sequentially evaluating cues and halting early if a cue fails to meet a predefined threshold. This approach is rooted in the concept of bounded rationality, which suggests that decision-makers often operate under constraints such as limited information and time (Simon, 1955). The FFT

heuristic offers a more efficient way to make decisions by reducing cognitive load and focusing on the most relevant cues (Gigerenzer & Todd, 1999). Research has shown that heuristics, including FFT, are effective in complex decision-making environments, such as HR management, where multiple factors must be considered simultaneously (Gaba et al., 2014).

The compensation decision-making model presented here is constructed using a combination of several advanced methods from decision theory, economics, human resource management, and computational modelling. These methods include probabilistic decision-making frameworks, Bayesian inference, heuristic decision rules, and optimization techniques. This literature review explores the relevant methods employed in the development of the model, analyzing their application and significance in the context of HR compensation decisions.

7. The Fast and Frugal Tree Model

7.1 Tolerance Level for Deviations in Market Alignment and Internal Equity

The tolerance level in this scenario cannot be arbitrary. I use a measure of stochastic tolerance which is based on the deviations in market alignment and internal equity. Tolerance therefore can be modelled as a random variable influenced by two factors- Organizational Risk Appetite and Historical Variability. To calculate this tolerance, past deviations from market and equity benchmarks need to be considered.

Standard deviation is given by the equation,

$$\sigma = \sqrt{\sum_{i=1}^n (d_i - \bar{d})^2 / (N-1)}$$

Let us assume that β is the risk appetite, then stochastic tolerance

$$T = Z(\beta). \sigma = \lambda / \mu, \sigma_i$$

7.3 FFT decision rules and construction

7.3.1 Key Decision Variables and Parameters

- C_r : Proposed compensation for role r.
- M_r : Median market salary for role r in the relevant industry.
- E_r : Internal equity benchmark for similar roles within the organization.
- B : Organizational budget for compensation allocation.
- F_s : Strategic importance factor for role r ($0 < F_s \leq 1$).
- P_r : The predicted future market trend for role r over a defined horizon.
- T : Acceptable tolerance level for deviations in market alignment and equity.

a. Internal Equity

If $|C_r - E_r| \leq T \cdot E_r$, then $T(c_1) = 1$, move ahead to c_2

else $T(c_2) = 0$, adjust for internal equity

b. Market Alignment

If $|C_r - M_r| \leq T \cdot M_r$, then $T(c_2) = 1$, move ahead to c_3

else $T(c_2) = 0$, adjust for market alignment

c. Budget Feasibility

If $(C_r \leq B)$, then $T(c_3) = 1$, move ahead to c_4

else $T(c_3) = 0$, reject compensation

d. Strategic Prioritization

If $(F_s \cdot C_r, \text{maximizes strategic value})$, then $T(c_4) = 1$, move ahead to c_5

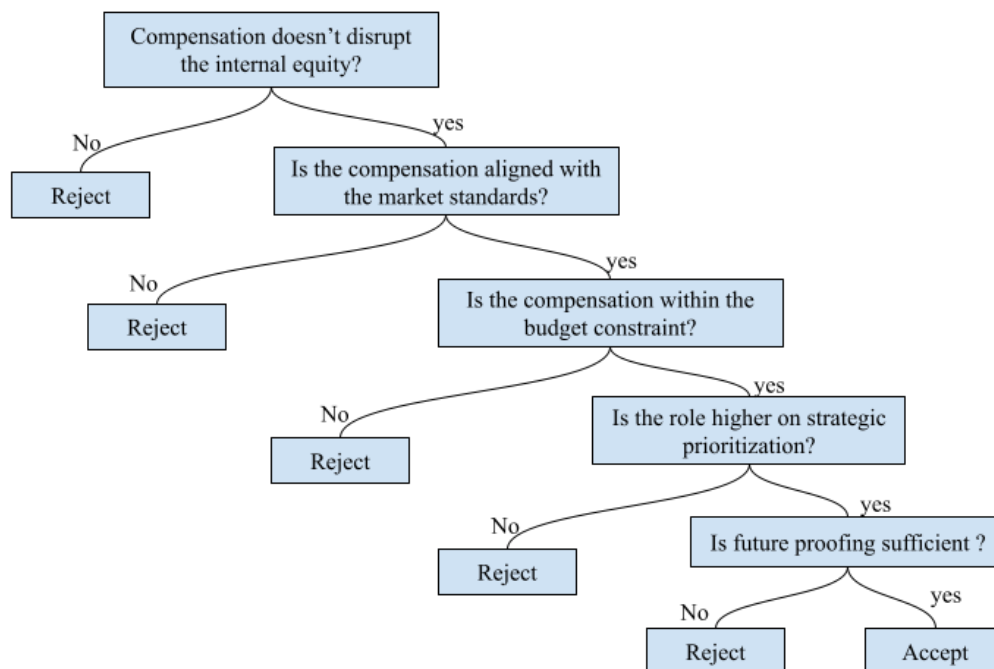
else $T(c_4) = 0$, if too low on strategic prioritization

e. Future-Proofing

If $(C_r \cdot (1 + P_r) \leq B)$, then $T(c_5) = 1$, accept compensation

else $T(c_5) = 0$, modify compensation offer

7.4 Visual Representation of Fast and Frugal Tree



8. Discussion

The fast and frugal tree created above acts as a simple heuristic tool to help the HR manager make quick decisions on compensation in situations of intense pressure. The author did not intend to propose another model for compensation decisions but rather tried to propose a way out of such a complex model and move towards a more practical heuristic tool. In actual scenarios within the organizational context, there always exists a time pressure to act with limited information and with the basics of data. All the data considered for this FFT such as data on market alignment or internal equity is available with the organization on the go. The way forward for this is to create a program that can automate this tree to generate faster results. Apart from the practical implication of this study to help HR managers make better and faster decisions, the research implications also abound. Firstly, the study opens avenues for the use of fast and frugal trees in HRM decision-making. Secondly, the study also lays down a step-by-step guide for researchers who wish to create a simple FFT for HRM issues. Thirdly, it provides practitioners with an easy toolkit to implement in the organization.

9. Conclusion

FFT's usage in the area of compensation decision making is a first step in trying to integrate the methodological aspect of FFT with minor modifications to benefit Human Resource Management in general. Future research can focus on how to integrate this into recruitment & selection, negotiations and performance management. Also on the method side, how can FFT be used in combination with other methods to achieve it. This study presents a conceptual model which requires robust testing to establish and further its applicability.

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