

THE JOB ATTRACTIVENESS OF AIRLINES TO STUDENTS IN TAIWAN: AN AHP APPROACH

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Abstract: This study identifies major factors influencing a job's attractiveness in the air transport industry and proposes an 'airlines' job attractiveness index' (AJAI) for Taiwan. Two major criteria (monetary, and non-monetary remuneration) and 10 subcriteria are found to influence a job's attractiveness to students in Taiwan. Wage/salary, ESOP (Employees' Shares-ownership Plan), job outlook, and corporate image are the top four influential subcriteria. Because students are not usually able to gain access to information related to the top three subcriteria from airlines, corporate image has the most important impact on students' future job selection in the airline industry. This research shows that air carriers have the most impressive corporate image in the air transport industry. Variables influencing job attractiveness are carefully screened using a model of experts panel and are quantified by the AHP to provide a 'Job Attractiveness Index' (JAI) model for the air transport industry in Taiwan.

Key Words: Job Attractiveness, Airlines, AHP (Analytical Hierarchy Process)

1. INTRODUCTION

This paper assesses students' perceptions of airlines' job attractiveness for different air transport industries in Taiwan. According to the Civil Aeronautic Law in Taiwan, there are five major industries in the airline business, namely, Ground Handling, Aeronautical Catering, Air Freight Forwarders, Air Cargo Terminals, and Air Carriers. Air transportation belongs to the service industry which relies heavily on the recruitment of high quality employees to maintain efficiency and competitiveness. Thus, employees' quality is known to be a primary determinant of its success. In Taiwan, airlines are struggling to recruit well qualified employees with better skills and more highly educated than in the past. A company's low job attractiveness will result in a failure to attract qualified job applicants, and the ultimate cost may be organisational failure (Barber and Roehling, 1993).

An appropriate recruitment process involves planning recruitment, cultivating recruitment sources, attracting recruits for job vacancies, and evaluating recruitment results (Mianzo, 2001). The attractiveness of a company is therefore very important to its human resource manager. Airline jobs are believed to be intrinsically more attractive than any job in other transportation modes in Taiwan but have not been examined previously. A job's attractiveness will be affected by two basic characteristics, monetary and non-monetary remuneration. How to model and measure a job's attractiveness quantitatively has never before been attempted.

2. LITERATURE REVIEW

Studies on a job's attractiveness have previously utilised qualitative methods and none has been related to the transportation industry in Taiwan.

Coleman and Irving (2001), using hypotheses derived from expectancy theory, found applicants will select an organisation that has the most attractive package of job features, and perceived attractiveness may be influenced by information source. Direct and reliable job information can attract more attention from student- job seekers applying for an opening vacancy.

Franke and Mueschen's (2001) research indicated career opportunities (including reputation and income), creative scope (i.e. colleagues and atmosphere), and risk/efforts (consisting of threat of sanctions, organisational structures and amount of work) had a major influence on a job's attractiveness as perceived by students.

Occupational Outlook Quarterly (2001-2002) suggested many criteria could be used to determine the attractiveness of an occupation. Of these, job outlook, earnings' levels, opportunities to be one's own boss, to help people, to express creativity, and to be physically mobile on the job were important factors increasing a job's attractiveness.

According to Harris and Fink (1987) (as cited in Mianzo, 2001), business-major undergraduate students evaluated actual job opportunities according to compensation, work environment, the job itself, and minor fringe benefits. Evaluation of the various job attributes was correlated with perceptions of job attractiveness and the likelihood of accepting the job. Results revealed a significant correlation between job attractiveness and job acceptance. Job attractiveness was influenced by compensation, work environment, and the job itself.

LaCharity's research (2000) indicated that important features to enhance job attractiveness should basically include benefits, type of work, and pay. Working with friendly co-workers, challenge, training, enjoying the job, positive work atmosphere, flexible hours, working a shift that did not interfere excessively with family life, advancement, stability, and the possibility of helping others were some factors which increased the attractiveness of a job opening.

Larsen and Philips (2000) found relevant information (actual information on the job and organisational attributes), applicants' ability (capacity to handle stress, knowledge of the job), and applicants' motivation factors (financial need, self-esteem) had a major influence on an organisation's attractiveness to job seekers.

Young, Place, Rinehart, and Baits (1997) investigated whether job attractiveness was related to economic incentives (extrinsic) or psychological fulfilment (intrinsic). They found the economic variability among competing organisations in the same industry was minimal; hence psychological incentives would appear to be the more effective methodology to use to recruit qualified student job-seekers from universities.

Barbe and Roehling (1993) used the verbal protocol analysis (VPA) technique to examine job-seekers' decision whether or not to apply for jobs. They found that location and compensation attracted the most attention from job seekers, and the amount of information provided by the recruiting company also influenced a job's attractiveness.

Rynes and Millers (1983) found that the most attractive features of sales positions to undergraduate students included company culture, job task, compensation and benefits, promotion opportunities, training opportunities, positive publicity, and corporate image.

3. QUESTIONNAIRE DESIGN

Based on the variables found from the literature, a panel of experts comprising five academicians from five different universities/colleges was formed to converge these variables into a hierarchical structure (Figure 1).

Major criteria were divided into monetary and non-monetary attractiveness, i.e. monetary and non-monetary remuneration and, in turn, divided into five sub-criteria that influenced airlines' job attractiveness. The ten subcriteria are detailed below and included as part of the introduction to explain the design of the questionnaire survey. Explanations of these 10 subcriteria were mainly referred to 'A Dictionary of Business' (2002) to make the

questionnaire ease of reading to all the participated students surveyees.

Monetary Attractiveness

(1) Wage/Salary: Wage is a fixed regular payment for work, typically paid on a daily or weekly basis; while salary is a fixed regular payment made usually on a monthly basis by an employer to an employee, especially a professional or white-collar worker.

(2) ESOP: Employees' Shares-Ownership Plan (Employee Stock-Option Plan): A method of providing the employees of a company with shares in the company. The ESOP buys shares in its sponsoring company, usually with assistance from the company concerned. The shares are ultimately made available to the employees.

(3) Annual Bonus: An extra payment made to employees by management, usually as a reward for good work, to compensate for something (e.g. dangerous work) or to share out the profits of a good year's trading. It is traditionally sent to employees at the end of each Chinese year.

(4) Meals Stipends: fixed regular allowance for meals, it is a tax-free payment to employees.

(5) Overtime Payment: Hours worked in excess of an agreed number per week or per day. The payment made for overtime work is usually higher than the basic rate of pay.

Non-Monetary Attractiveness

(1) Superior Corporate Image: The image that a company projects of itself. To project a benevolent image of the way a company treats its employees or the environment, for example, can be as important to its sales as its individual brand image.

(2) Fringe Benefits: These are non-monetary benefits offered to the employees of a company in addition to their wages or salaries. They include company car, expense account, the opportunity to buy company products at reduced prices, private health plan, canteen with subsidised meals, luncheon vouchers, cheap loans, social clubs, etc.

(3) Work Atmosphere/Environment: Harmonious relationships among colleagues/Good office location and interior layout.

(4) Job Outlook: the future opportunity to advance in job position.

(5) Work Autonomy/Flexibility: the possession or right of self-government in work/the possession or right of flexible working hours.

4. METHODOLOGY

The literature reviewed used a mainly qualitative approach in introducing the importance of

job selection/attractiveness criteria. However quantitative data sometimes could give precise figures about attractive a company is to its potential employees when compared with its competitors. In terms of methodology, this paper reviews briefly currently popular Multi-Criteria Decision Making Methodologies (MCDM), opting for one of the most effective among them, i.e. the Analytical Hierarchy Process or AHP. The Analytical Hierarchy Process (AHP) is used to determine the cumulative job attractiveness of individual airlines in Taiwan to undergraduate students. The major criteria and the sub-criteria are the two system components considered in the AHP.

The AHP, which was developed by Thomas Saaty in 1971, is a flexible tool which can be applied to any hierarchy of performance measures (Rangone, 1996). It has been widely used since its first appearance in the Journal of Mathematical Psychology in 1977 (Satty, 1977), by individuals, corporations and governments, for various purpose, ranging from journal quality ranking (Donohue and Fox: 2000, Forgionne, Kohli and Jennings: 2002), supplier assessment (Handfield, Walton, Sroufe and Melnyk: 2002), project management (Kamal M. Al-Subhi Al-Harbi, 2001), packing material selection (Xu, Xub, and Chena, 2002), TQM implementation in manufacturing industries (China, Punb, Xuc and Chand, 2002), to the study of critical factors for the selection of fuel sources for transportation in the future (Winebrake and Creswick, 2003).

Saaty (1980) proposed a measure of the inconsistency in judgements, called the Consistency

Index (CI), that is given by
$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

where λ_{\max} is the principal eigenvalue of the judgement matrix and n is its order.

When the reciprocal comparison matrix is consistent, $\lambda_{\max} = n$, and the CI is equal to zero;

otherwise, its value is positive. To overcome the $CR = \frac{CI}{RI(n)}$ order dependency of the CI,

Saaty also proposed a normalised measure, called the CR, Saaty (1994) proposed a 10% threshold for the CR (thresholds of CR are 5% and 8% for the 3 by 3 and 4 by 4 matrices, respectively). When the CR is greater than 10%, then, in order to improve the consistency,

most inconsistency judgements are usually modified to narrow down difference between a_{ij} and i/j to obtain a better consistency (Aguarón and Moreno-Jiménez, 2003). However, if the higher CR is because of experts' extreme but consistent pairwise judgement, then the CR value is acceptable and valid for further quantitative analysis, even if it is greater than 10% (Fordman, 2001).

Basic rules for modelling and solving the hierarchical problem involved four phases or principles presented below:

- ① Structuring: This phase involved formulating an appropriate hierarchy of the AHP model consisting of the goal, criteria, subcriteria and the decision alternatives;
- ② Data collection: This involved forming a team of evaluators who assigned pairwise comparisons to the major criteria and subcriteria used in the AHP hierarchy.
- ③ Normalised weights in different hierarchies: The pairwise comparison judgement matrices were combined using the geometric mean approach at each hierarchy level to obtain the corresponding consensus pairwise comparison judgement matrices.
- ④ Synthesis: The final step for this study was to synthesise the solution for the port selection problem (Tam and Tummala, 2001; Lirn et al., 2002).

5. SAMPLING AND RESEARCH PROCESS

Due to large numbers of university and the large students population in Taiwan, it is impossible to survey every university and even every students to find out the optimal airlines job attractiveness industry within a valid time frame. And the transportation and shipping/logistic related department students had higher propensity to serve in the air transportation industry than students in the other non-transportation related department. So five leading transportation related department students were chosen as subrogates to find out the sub-optimal job attractiveness index in the airlines industry.

The survey was conducted through personal networking and with help from students of five teaching organisations in Taiwan that all had transportation or shipping/logistics departments. Academic departments are identified here with the sequential letters α , β , γ , δ , and η to maintain their anonymity. Through personal networking, AHP questionnaires were distributed to five major universities/ colleges/institutes in Taiwan during May 2001. Of these, α and β were in prominent national universities located in Tainan and Taipei; γ , δ , and η were in newly established private universities, respectively, located in the northern, central and southern parts of Taiwan. Three hundred questionnaires were distributed, 193 copies were returned, and of these 127 were fully completed. However, only 62 passed consistency test when examining their C.I. and C.R. values. These 62 were evenly distributed among the five major universities.

6. RESEARCH RESULTS

The research results are presented in five Tables. Table 1 shows that students from the

different universities in the survey attributed different importance (weight) to the 2nd tier subcriteria (ten job selection subcriteria that influenced a job's attractiveness to students).

Table 1. Job attractiveness variables and their importance
(JACW: job attractiveness criterion weight) as perceived by 62 students

Students' Academic Departments JACW *		α	β	γ	δ	η	G.M.*
		10 students	14 students	13 students	12 students	13 students	
Variables							
1 st Tier Factor	2 nd Tier Factors						
Monetary (49.55%)	1. Wage/Salary	11.1%	9.6%	25.1%	19.4%	18.2%	16.40%
	2. ES OP	10.2%	12%	20.2%	15.4%	16.5%	15.11%
	3. Annual Bonus	10.2%	10.1%	7.5%	8.5%	5.6%	8.57%
	4. Overtime Payment	4.6%	5.2%	5.6%	10.1%	8.5%	6.79%
	5. Meals Stipends	3.4%	2%	2.2%	2.4%	3.1%	2.69%
Non Monetary (50.45%)	6. Job Outlook	19.1%	17.4%	12%	11.2%	15.7%	15.45%
	7. Corporate Image	18.3%	16.5%	8.7%	5.1%	11.2%	11.35%
	8. Work Atmosphere/Environment	12%	9.8%	4.2%	9.6%	9.3%	8.88%
	9. Fringe Benefits	5.5%	6.4%	9.3%	10%	6.8%	7.75%
	10. Work Autonomy / Flexibility	5.6%	11%	5.2%	8.3%	5.1%	7.02%

Note: The ten factors' values in column α are the geometric mean of the 10 students' replies in academic department α .

* JACW (job attractiveness criterion weight) in the last column of each row is the G.M. value of the number of observations. Possible maximum JACW value =100%, and possible minimum value =0%.

* *G. M.: Geometric Mean.

Academic Department α (National University); Academic Department β (National University); Academic Department γ (Private University); Academic Department δ (Private University); Academic Department η (Private University); G.M. = $(\alpha \times \beta \times \gamma \times \delta \times \eta)^{1/5}$

Students from both α and β academic departments were mostly concerned with "non monetary factors". Students from γ , δ and η academic departments were mostly concerned about "monetary factors". Under monetary remuneration, "ESOP" and "Wage/Salary" were the two most

influential subcriteria for students in academic departments γ and δ . Students in γ and η also attributed significant importance to “job outlook” and “corporate image”. Different subcriteria could be used as tools to attract different types of job seekers.

Since 62 students’ answers were valid for this research, the author presents the responses of one student (I) (see Tables 2 and 3) to illustrate how subcriteria were evaluated in order to devise an overall job attractiveness Index (OAJAIS) for Taiwan (see Table 4).

Table 2. Job attractiveness performance scores (JAS) of the “wage/salary” subcriterion evaluated by student (I)

Airline	A	B	C	D	E	F		Weight (Score)	W	$\lambda_{max} =$	
A	1	1	3	3	2	2	12	0.26471	1.6323	6.02	
B	1	1	3	3	2	2	12	0.26471	1.6323		
C	1/3	1/3	1	1	1/2	1/2	3 2/3	0.08088	0.4926	C.I. =	
D	1/3	1/3	1	1	1/2	1/2	3 2/3	0.08088	0.4926	0.00	
E	1/2	1/2	2	2	1	1	7	0.15441	0.8970		
F	1/2	1/2	2	2	1	1	7	0.15441	0.8970		
Sum	45 1/3										

Note: the value at the intersection of A row and C column is 3, which means the performance of airline A on “wage/salary” subcriterion is three times better over airline C when it is perceived by individual student (I).

The job attractiveness index (JAI, see Table 3) of six Taiwanese schedule passenger airlines to an individual student (I) was calculated by multiplying the 62 students’ geometric mean pairwise ‘job attractiveness criterion weight’ of airlines ABCDEF (JACW, see Table 1) by his ‘job attractiveness scores’ (JAS, see Table 2).

Table 3. **Job attractiveness index (JAI)** of “wage/salary” subcriterion evaluated by student
(I)

Airline		A	B	C	D	E	F
I.	16.40%	0.04341	0.04341	0.01326	0.01326	0.02532	0.02532
II.	15.11%	0.04000	0.04000	0.01222	0.01222	0.02333	0.02333
III.	8.57%	0.02269	0.02269	0.00693	0.00693	0.01323	0.01323
IV.	6.79%	0.01797	0.01797	0.00549	0.00549	0.01048	0.01048
V.	2.69%	0.00712	0.00712	0.00218	0.00218	0.00415	0.00415
VI.	15.45%	0.04090	0.04090	0.01250	0.01250	0.02386	0.02386
VII.	11.35%	0.03004	0.03004	0.00918	0.00918	0.01753	0.01753
VIII.	8.88%	0.02351	0.02351	0.00718	0.00718	0.01371	0.01371
IX.	7.75%	0.02051	0.02051	0.00627	0.00627	0.01197	0.01197
X.	7.02%	0.01858	0.01858	0.00568	0.00568	0.01084	0.01084
XI.	JAI	0.26473	0.26473	0.08089	0.08089	0.15443	0.15443

Note 1.: 0.04341 (JAI in Table 3) = 16.40% (JACW in Table 1) x 0.26471 (JAS in Table 2)

Note 2.: Value of Item XI. = Summation the values from Item I to Item X.

Note 3.: JACW I.–X represented geometric mean weight of 10 ‘job-attractiveness variables’ perceived by 62 students in five universities (See Table 1, 2nd tier factors 1-10), namely

I: Wage/Salary II: ESOP III : Annual Bonus IV: Overtime Payment
 V: Meals Stipends VI: Job Outlooks VII: Corporate Images
 VIII: Work Atmosphere/Environment IX: Fringe Benefits X: Work Autonomy / Flexibility

A and B were two major Taiwanese international schedule passenger airlines; C and D were subsidiary companies of company A and B, respectively; E and F were large domestic air carriers with extensive international flight experience (both charter and schedule flights).

Overall Job Attractiveness Index (OJAI) of the six Taiwanese schedule passenger airlines was calculated and is shown in Table 4. Two international schedule passenger airlines had the best OJAI, and their subsidiary companies (two domestic air carriers) had the lowest AJAI within the industry in Taiwan. Carriers E and F had the second best OJAI.

The JAI will be changed if the importance of JACW perceived by student (I) changed, so the AHP method also allows a sensitivity analysis to be carried out to see the trade-off between JACW and airlines’ overall job attractiveness ranking. Since this paper is focusing on the introduction of the quantitative concept of Job Attractiveness Index, therefore sensitivity is not presented in this paper.

Table 4.
Overall Job Attractiveness Index (OAJAI*) of six Taiwanese airlines evaluated by 62 students

Airlines	Students' Acad. Dept.	α	β	γ	δ	η	G.M.** (%)
	OAJAI *	10 students	14 students	13 students	12 students	13 students	
Airlines A (international Schedule)		0.0268	0.0293	0.0236	0.0345	0.0256	2.34
Airlines B (international Schedule)		0.0274	0.0361	0.0123	0.0432	0.0323	2.35
Airlines C (Domestic)		0.0037	0.0024	0.0076	0.0024	0.0035	0.36
Airlines D (Domestic)		0.0032	0.0035	0.0032	0.0038	0.0056	0.38
Airlines E (Domestic & International)		0.0055	0.0094	0.0126	0.0212	0.0125	1.12
Airlines F (Domestic & International)		0.0052	0.0078	0.0115	0.0098	0.0089	0.84

Note: The ten factors' values in column α , β , γ , δ , and η are the geometric mean of the 10, 14, 13, 12, and 13 students' replies in academic departments α , β , γ , δ , and η .

*OAJAI = JACW \times JAS (Job Attractiveness Scores) of each variable perceived by 62 students (Possible maximum OAJAI = 100%, Possible minimum OAJAI = 0%)

** G. M.: Geometric Mean

Questionnaires also examined the attractiveness of other air transportation businesses to students and compared it with that of the air carriers business. The job attractiveness index of the different businesses in the air transportation industry is shown in Table 5. Air carriers had the highest JAI in the air transportation industry in Taiwan. In addition, this particular type of business offered the highest number of employment opportunities in the air transportation industry. Because most air carriers (China Airlines, EVA Airways, Far Eastern Air Transport Co., and UNIAIR company), and one air cargo terminal operator (Everterminal Co., Ltd.) were all listed on the Taiwan Stock Exchange, this possibly made them appear reputable and secure; their ESOP seemed more valuable from the students' point of view.

Table 5. Job Attractiveness Index of five air-transportation businesses evaluated by 62 students

Students' Acad. Dept. JAI *		α	β	γ	δ	η	G.M.** (%)
		10 students	14 students	13 students	12 students	13 students	
Air Transportation Industry							
1.	Ground Handling business	0.0089	0.0095	0.0105	0.0123	0.0127	1.07
2.	Aeronautical Catering business	0.0066	0.0054	0.0069	0.0072	0.0079	0.67
3.	Air Freight forwarder business	0.0046	0.0049	0.0067	0.0075	0.0088	0.63
4.	Air Cargo Terminal business	0.0097	0.0092	0.0088	0.0121	0.0120	1.03
5.	Air Carriers business	0.0120	0.0148	0.0118	0.0192	0.0147	1.43

Note: The ten factors' values in column α , β , γ , δ , and η are the geometric mean of the 10, 14, 13, 12, and 13 students' replies in academic departments α , β , γ , δ , and η .

* Job Attractiveness Index (JAI) = JACW \times Pairwise Ranking of a Company's Performance Scores. (Maximum possible JAI = 100%, Minimum possible JAI = 0%)

** G. M.: Geometric Mean

7. CONCLUSION

Two major international schedule airlines in Taiwan, China Airlines and EVA Airways, separated their international and domestic services fleets and set up two fully controlled subsidiary airlines to serve the domestic routes in the 1990s. Subsequently, China Airlines' and EVA Airways' corporate images improved as a result of the growing profitability of their international services fleets. Their much higher OAJAIs than those of carriers E and F resulted from their enhanced corporate image and higher employee wages/salaries. Therefore, with higher OAJAIs, China Airlines and EVA Airways would find it much easier to attract the interest of the undergraduate elite and generate their desire to seek job openings with them. In fact, in March 2003 more than 8,000 graduates applied for 150 job openings with China Airlines.

Non-monetary variables had almost the same influence on the AJAI value. In the globalised business environment, cost consideration and service competition have become unavoidable in the airline industry. Without resorting to pay rises, airlines can still utilise non-monetary variables to attract high quality job applicants from universities. Among them, job outlook

and corporate image are two of the most important. The marketing of airlines' corporate image to university students can be easily increased through its sponsorship of scholarships, seminars, conferences, and its executives lecturing in universities. In addition, these types of activities increase airlines' personal contact with university students, and personal contact is the most popular means whereby young men find their jobs (Staiger, 1990, p.7).

8. LIMITATION OF THE STUDY

Of the 300 questionnaire surveys administered to undergraduate students only 62 passed both the CI and CR tests. This suggests that the AHP methodology should be explained carefully to surveyees before conducting the research to minimize the number of invalid questionnaires. A low valid reply rate may significantly influence the results of a survey. The original author of the methodology suggests following up inconsistent replies, but this is both time-consuming and inconvenient to both the researcher and surveyees.

9. SUGGESTIONS FOR FURTHER RESEARCH

At the time of writing, there was no aeronautic oriented university in Taiwan. Airlines' potential employees are drawn from different academic departments in universities. The present research was, however, confined to undergraduate students in transportation related academic departments. A broader survey could be undertaken among undergraduate students from different academic departments throughout Taiwan. As a consequence, students from different departments may indicate different major factors influencing a job's attractiveness in the air transport industry.

Long-term observation of the Overall Airlines' Job Attractiveness Index (OJAI) could have recruitment implications for specific airlines over time, possibly necessitating further surveys to analyse factors influencing fluctuations in the index. A future study could also focus on the feasibility of applying the AHP in a dispersed geographical research area using a mailed questionnaire survey.

Figure 1. Hierarchy of Airlines' Job Attractiveness

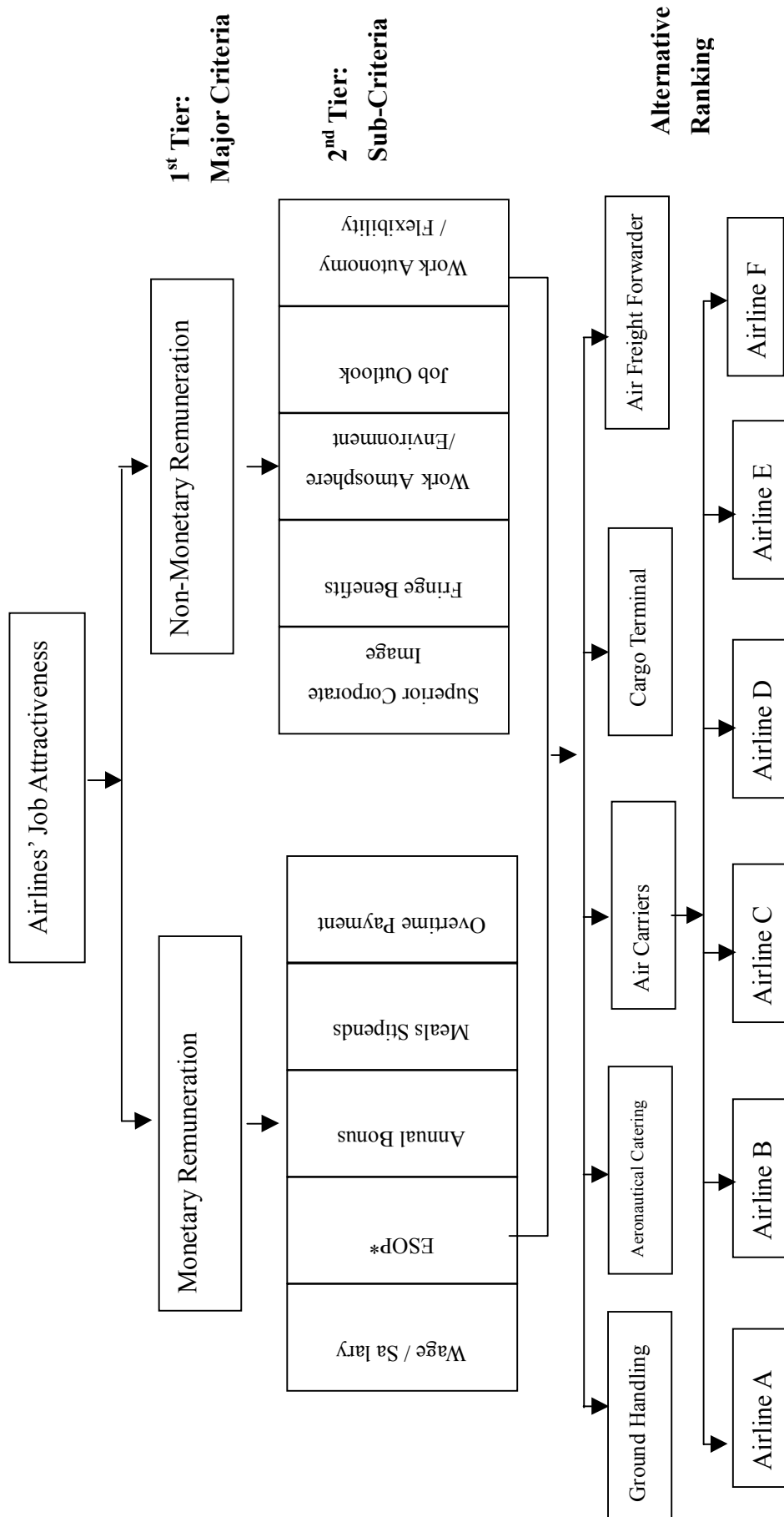


Figure 1. The Hierarchy of Airlines' Job Attractiveness

Note. ESOP: Employees' Shares-Ownership Plan (Employee Stock-Option Plan).

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