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The Application of The Agency Theory In Planning And Staff Assignment of CPA Firms

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Abstract

This article extends the concept of agency theory to multi-objective contractual settings and operationalizes the elements of the basic agency model by applying that model to the operations of a CPA firm, and specifying the pareto-optimal contracts that can be established between the agent and principal. The author demonstrates that when a principal faces multi-objective contractual decisions and when a CPA

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firm's, accounting system provides information that explicitly formulates the agent-principal model, the principal can determine **quantitatively** the effect of a given agent's contract on the operations and objectives of the firm. The article also illustrates the sensitivity of each alternative contract and specific sacrifices a principal must make to satisfy the demands inherent in each of an agent's alternative contract proposals. Finally, for each alternative optimal contract, the author derives the optimal scheduling assignments for each auditor in each auditing activity.

This pragmatic scheduling assignment also reflects those changes in the auditor's assignments for each activity necessitated by the hiring of a new agent.

Introduction

Recently, attention has focused on the audit staff assignment planning of CPA firms. This interest reflects significant functions within the CPA firms that are rapidly becoming quite complex and cumbersome. At this time, CPA firms are not only involved in such traditional activities as auditing and tax configuration, but they also provide their clients with non-traditional services like management consulting and computer programming assistence. In addition, CPA firms are now responsible to third parties for any statements that certify the financial representations of their clients. This legal consideration requires careful planning of the CPA firms' audit staff so that adequate skills and sufficient work

hours are devoted to each job before the firm reaches conclusion about a client's financial position.

The CPA firm's audit staff assignment schedules also affect the audit staff morale and motivation, the clients' financial obligations, and the CPA firm's competitive position in the market place [Balachandran and Zoltners, 1981]. Likewise, it might influence the attitude of the creditors and investors of the CPA firm's clients towards the clients' accounting practices, the quality of the CPA firm's audit, and even public impressions of the quality of the accounting profession itself. Furthermore, the promulgations of the American Institute of Certified public Accountants and other regulatory agencies call for CPA firms to formally prepare planning schedules that enable them to operate more effectively and efficiently, to render professionally acceptable services to their clients, and to anticipate the dynamic aspects of the future more accurately. Given the importance of this audit staff planning and its enormous potential economic effects, a systematic study is required to determine the optimal manpower assignments within CPA firms.

Several studies have been attempted in this area. These studies have derived an optimal audit staff scheduling scheme by explicitly formulating the activities of a hypothetical CPA firm, and by applying an optimization technique. In particular linear programming [Summers, 1972], goal programming [killough and Souders, 1973; Welling, 1977], integer programming

[Balachandran, 1981]' and interactive multiobjective programming [Balachandran and Steuer, 1982] have been employed to identify the optimal scheduling assignments of the CPA firm's auditors. These studies have increased our understanding of the complexities involved in manpower planning within CPA firms' and they have identified the optimal scheduling assignments of the staff auditors. But, two significant aspects of audit staff planning have yet to be addressed in the literature:

(1) the effects of uncertainty and

(2) the effects of hiring a new auditor on the firm's manpower scheduling.

This article derives the cptimal audit staff scheduling for a CPA firm when its manager: (1) faces the need to develop that schedule under uncertain conditions; (2)holds multiple, incompatible objectives; and (3) explores the possibility of hiring a new auditor.

It discusses the employment contractual model struck by the firm's manager and its prospective auditor, various pareto-optimal contracts that can be presented to a prospective auditor, and their effects on the audit staff planning in terms of agency theory paradigm [Ross, 1973; Demski and Feltham, 1978; Atkinson, 1979; Holmstrom, 1979; Shavell, 1979; Baiman and Demski, 1980, Gjesdal, 1981, Baiman, 1982, Namazi, 1985, Jones and Butter, 1992, Fox and Hamilton, 1994]. The Optimal scheduling assignments are derived with a multi - objective optimization

model known as "the Method of Constraints" [Cohon and Marks, 1975, Dauer, 1980, Dauer and Krueger, 1980].

This article consists of eight sections. Sections I and II formulate the manager (principal) and prospective auditor (agent) models, respectively. Section III focuses on the interaction of the agent - principal model and discusses significant characteristics of employment contracts. Section IV provides numerical data concerning the agent's and principal's models, and alters the principal's models, to incorporate changes that reflect significant employment conditions imposed by the agent. The solution procedure and the optimal audit staff scheduling assignment appear in Section V. Section VI suggests a further extension of the principal's model to a multi-objective setting and graphically presents pareto-optimal contractual solutions. Section VII discusses the significant implications of this study for the accounting profession. Section VIII provides summary and concluding remarks.

I- The Principal's Model

The successful establishment of an employment contract between the management of a CPA firm (the principal) and labor (the agent) requires the employment process to be based upon strategic and tactical planning within the firm. Thus, before originating any employment contracts, the CPA firm must investigate its current and future resources, its manpower

requirements, and its obligations. The firm will typically base the development of different plans upon information provided by its managerial accounting system. But because traditional accounting systems provide information relating only to the past activities of the firm, while the firm's planning requires information about future activities, the firm's accounting system must be extended so as to incorporate this information about future activities. Having incorporated this relevant, supplemental information into its accounting system, management can designate the plans that are to be implemented. Given appropriate plans and choosing a relevant mathematical technique, management can investigate the effects of hiring a new individual (auditor) on scheduling, work assignment activities, and operations of the firm. Consequently, the pareto-optimal incentive contract that should be established between labor and management can be accurately specified.

I (1)- Objective Function

To elaborate, consider a hypothetical CPA firm that operates upon the following five assumptions:

(1) The firm consists of (n) different individuals (auditors) who are performing (m) different independent activities that may include, for example, auditing, tax preparation, management advisory services, and continuing education;

(2) all of these activities generate some revenue for the firm except one, professional development activity;

(3) each auditor is assigned to several jobs and must participate in professional development activity;

(4) each individual charges his clients different rates for each activity; and

(5) the common objective of the individuals is to maximize contribution margins of the firm (Z_1). This objective is a function of the individuals' Estimated Total Revenues (ETR) and Estimated Total Variable Expenses (ETVE) expected to occur during the coming period; that is,

$$Z_1 = f\,(ETR - ETVE)\,. \qquad (1.1)$$

The (ETR) is a function of total hours (regular hours, x_{ij}, and overtime hours, y_{ij}, if any exist) devoted by each auditor (i) to each activity (j), and the per-hour charge rates for the functions performed (w_{ij}). The value of (w_{ij}), however, is uncertain and depends on the action or level of effort selected by each auditor in each job, $a_{ij} \varepsilon A$, the state of nature that will prevail in the future, $s_{ij} \varepsilon S$, and the posterior probability assessment of each auditor with respect to the non-controllable factors that will occur, $(s_{ij} \mid n, y'_{ij}, a_{ij})$. Thus, the ETR can be mathematically written as

$$ETR = f\{\sum_{i=1}^{n} \{\sum_{j=1}^{m-1} (x_{ij}+y_{ij}) \cdot [\sum_{s_{ij} \varepsilon s} (a_{ij}, s_{ij}) \cdot \theta\,(s_{ij} \mid n, y'_{ij} \varepsilon n, a_{ij})]\}\} \qquad (1.2)$$

The (ETVE), on the other hand, is assumed to be a function of the salaries to be paid to each auditor based upon the total

regular hours of workload on different activities, related over time, the amount of the bonus (incentive mechanism scheme)designed to motivate each auditor to select the best action (effort), and the expenses incurred for the auditors' professional development. The (ETVE) can be mathematically shown as

$$ETVE = f\{\sum_{i=1}^{n} \{\sum_{j=1}^{m} (x_{ij})\, \alpha_i + \sum_{j=1}^{m-1} (y_{ij})\, \beta_i + \sum_{j=1}^{m-1} [(x_{ij})\, \alpha_i + (y_{ij})\, \beta_i]\, \gamma_i\}\} \quad . (1.3)$$

where

α_i = the regular hourly rate of an auditor (i);

β_i = the overtime hourly rate of an auditor (i); and

γ_i = the fixed percentage denoting the bonus given to an auditor (i).

Equation 1.3 indicates that the ETVE is a function of (1) the amount to be paid to (n) auditors for their regular hours (including professional development hours) spent in (m) activities; (2) the amount to be paid to (n) auditors for their overtime hours spent in revenue generating activities; and (3) the amount of the bonuses to be paid to (n) auditors based upon the total regular and overtime hours devoted to revenue generating activities. Consequently, the objective function of the firm can be denoted as:

$$\text{Max } Z_1 = f\{ \sum_{i=1}^{n} \sum_{j=1}^{m-1} \{ (x_{ij}+y_{ij}) \cdot [\sum_{s_{ij} \varepsilon s} (a_{ij}, s_{ij}) \cdot \theta (s_{ij} \mid n, \underset{y' \varepsilon n}{y'_{ij}}, a_{ij})] \} -$$

$$\sum_{i=1}^{n} \{ \sum_{j=1}^{m} (x_{ij}) \alpha_i + \sum_{j=1}^{m-1} (y_{ij}) \beta_i + \sum_{j=1}^{m-1} [(x_{ij}) \alpha_i + (y_{ij}) \beta_i] \gamma_i] \}. \quad (1.4)$$

An objective function by itself would be meaningless if there were no constraint to limit the attainment of the desired objective. These constraints may reflect legal, environmental, and economic considerations. Only certain constraints pertinent to a CPA firm are included for illustrative purposes.

I (2a)- Total Regular Hours Requirement

$$\sum_{j=1}^{m} x_{ij} = c_i \qquad , (i= 1, 2, ..., n) \quad (1.5)$$

where (c_i) represents the total regular hours the auditor (i) is expected to work on different activities for the coming period.

I (2b)- Maximum Overtime

$$\sum_{j=1}^{m-1} y_{ij} \leq d_i \qquad , (i= 1, 2, ..., n) \quad (1.6)$$

where (d_i) denotes the total maximum overtime hours allowed for auditor (i) during the coming period.

I (2c)- Professional Develooment Hours Requirement

$$x_{im} = e_i \qquad , i = (1, 2, ..., n) \tag{1.7}$$

where (e_i) denotes the total hours auditor (i) must devote to professicnal activities for the coming period.

I (2d)- Standard Permitted

$$\sum_{i=1}^{n} (x_{ij}+y_{ij}) \leq f_j \ , (j= 1, 2, ..., m-1) \tag{1.8}$$

where (f_j) designates the total standard hours estimated for activity (j).

I (2e)- Incentive plan

$$\gamma_i \left[\left(\sum_{j=1}^{m-1} x_{ij}\right) \alpha_i + \left(\sum_{j=1}^{m-1} y_{ij}\right) \beta_i\right] \leq g_i \ , (i = 1, 2, ..., n) \tag{1.9}$$

where (g_i) represents the maximum amount of bonus (based upon total salaries to be earned from revenue generating activities) that may be paid to an auditor (i) during the coming period.

Given the objective function (z_1) and preceding constraints, a principal can obtain the optimal planning scheme that indicates the number of regular and overtime hours each auditor should perform in each activity in order to attain the designated objective. Once he sets forth this manpower scheme, a principal

should focus on those activities that require more labor. Consequently, if the firm's assignment plan calls for hiring new labor, the employment process must begin, a process that requires labor's decision model to be explicitly formulated.

II- The Agent's Model

Assume that a prospective worker seeks at time (t_o) to provide his services and possibly his information. An imperfect labor market provides the agent (p) different jobs (J), where J= 1,2,...p --each of the J = 1,2,...,p jobs offering different monetary and non-pecuniary attributes. Hence, the agent's problem at time (t_o) is to select the preferred subset of J (for example, J_k) for future periods ($t_1,t_2,...,t_n$). The key to making choice (J_k) is that the agent must organize complex and dynamic decisions into a systematic framework that explicitly incorporates the objective function and the various constraints he has already anticipated.

Let's assume that A = ($a_1, a_2, ..., a_n$) is the set of all actions available to an agent at time (t_o). Assuming also that he desires only to maximize monetary values, he would select a subset of (A)that maximizes its monetary function (for example,a). The agent would base his selection upon the consequences of choosing (a). The consequences of action (a), however, depend on certain factors beyond the agent's control. Let S =($s_1, s_2,..., s_n$) denote the set of states of nature affecting the outcome of labor and (s) represent the particular state of nature beyond labor's control but

affecting (a). The outcome produced by labor can, under these assumptions, be denoted as $w_k = (a, s)$. Since the value of (w_k) is determined at time (t_o) for future periods, labor must also assess the posterior probability of the selected state of nature (s). This assessment is made based on an assignment of the prior probability of the (s^*) and subsequent use of the accounting information (y) provided from the firm's managerial accounting system (n). Thus, we can denote the labor's outcome function as:

$$w_k = \Sigma\ (a^*, s^*)\ .\ \theta\ (s^*\ |\ n, y, a^*).$$

From labor's perspective, (w_k) represents the expected amount of monetary value to be received, say, per hour. In this case, if a contract under negotiation (a) requires labor to operate certain regular hours on specific activities during the coming period, (b)provides for over-time, and (c) includes an incentive mechanism that supplies a bonus based upon total salary (regular hours and overtime) paid to labor for revenue generating activities, we can mathematically denote the objective function of labor as follows:

$$\text{Max } Z_2 = f\{\sum_{j=1}^{m} [\ (x_{kj}).\ \Sigma\ (a^*_j, s^*_j)\ \theta(s^*_j\ |\ n, y_j, a^*_j)] + \sum_{j=1}^{m-1} [(y_{kj}).\mu_1 \Sigma\ (a^*_j, s^*_j).$$

$$\theta(s^*_j)\ |\ n, y_j, a^*_j)] + \mu_2\ [\sum_{j=1}^{m-1} (x_{kj}).\ \Sigma\ (a^*_j, s^*_j)\ \theta\ (s^*_j\ |\ n, y_j, a^*_j) +$$

$$\sum_{j=1}^{m-1} (y_{kj})\ .\ \mu_1\ \Sigma\ (a^*_j, s^*_j)\ \theta\ (s^*_j\ |\ n, y_j, a^*_j)]\} \qquad (1.10)$$

where

x_{kj} = regular hours the agent (k) would devote to the job (j);

y_{kj} = overtime hours the agent (k) would spend on the job (j);

μ_1 = labor's (k) overtime rate per hour, and

μ_2 = bonus percentage established for labor (k).

To maximize the objective (Z_2), certain constraints that limit its attainment must be specified. These constraints may reflect legal conditions, the economic climate, a principal's wishes, or the agent's desires. Consequently, the following selected constraints are designated here:

II (2a)- Regular Hours Requirement

$$\sum_{j=1}^{m} (x_{kj}) = h_k \qquad (1.11)$$

whre (h_k) represents the total regular hours labor must allocate to different activities for the coming period.

II (2b)- Maximum Overtime

$$\sum_{j=1}^{m-1} (y_{kj}) \leq i_k \qquad (1.12)$$

where (Ik) denotes the maximum overtime hours allowed to labor (k) to perform the firm's different revenue generating activities

during the coming period.

II (2c)- Professional Development Requirement

$$x_{km} = l_k \qquad (1.13)$$

where (l_k) represents the total hours labor must use to increase its vocational knowledge during the coming period.

II (2d)- Incentive Mechanism

$$\mu_2 \{ \sum_{j=1}^{m-1} [(x_{kj}) \Sigma (a^*_j, s^*_j) \theta (s^*_j | n, y_j, a^*_j)] + \sum_{j=1}^{m-1} [(y_{kj}) \mu_1 \Sigma(a^*_j, s^*_j) \cdot \theta(s^*_j) | n, y_j, a^*_j)]\} \leq g_k \qquad (1.14)$$

where (g_k) denotes the maximum amount labor might receive as a bonus during the coming period in order to discourage labor from selecting an action (or effort) that will jeopardize the principal's welfare.

III Interaction of The Agent And Principal Models

The establishment of a pareto - optimal contract (l) between an agent and principal requires (l) to satisfy labor's decision model; that is, it must fall within the feasible region of program 1.10 through 1.14. Furthermore, for the contract (l) to be incentive compatible, no other contract can provide greater benefits than the contract (l) offered to the agent. These antecedents are necessary for attracting the worker from the

labor market. On the other hand, the pareto-optimality condition requires that the fee schedule proposed to labor maximize the principal's model. Thus, the principal's problem, when the contract (l) is being initiated (and after rearranging labor's constraints) can be mathematically shown as follows:

$$\text{Max } Z_1 = f\{\sum_{i=1}^{n+1}\sum_{j=1}^{m-1}\{[(x_{ij}+y_{ij}) \cdot [\sum_{s_{ij}\in S}(a_{ij}, s_{ij}) \cdot \theta(s_{ij} \mid n, y'_{ij}, a_{ij})]\} -$$

$$\sum_{i=1}^{n+1}\{\sum_{j=1}^{m}(x_{ij})\alpha_i + \sum_{j=1}^{m-1}(y_{ij})\beta_i + \sum_{j=1}^{m-1}[(x_{ij})\alpha_i + (y_{ij})\beta_i]\gamma_i\}\} \quad (1.15)$$

$$\text{Max } Z_2 = f\{\sum_{j=1}^{m}[(x_{kj}).\sum(a^*_j, s^*_j)\theta(s^*_j \mid n, y_j, a^*_j)] + \sum_{j=1}^{m-1}[(y_{kj}).\mu_1\sum(a^*_j, s^*_j).$$

$$\theta(s^*_j) \mid n, y_j, a^*_j)] + \mu_2[\sum_{j=1}^{m-1}(x_{kj}).\sum(a^*_j, s^*_j)\theta(s^*_j \mid n, y_j, a^*_j) +$$

$$\sum_{j=1}^{m-1}(y_{kj}) \cdot \mu_1 \sum(a^*_j, s^*_j)\theta(s^*_j \mid n, y_j, a^*_j)]\} \quad (1.16)$$

subject to

$$\sum_{j=1}^{m} x_{ij} = c_i \quad , (i = 1, 2, ..., n+1) \quad (1.17)$$

$$\sum_{j=1}^{m-1} y_{ij} \leq d_i \quad , (i = 1, 2, ..., n+1) \quad (1.18)$$

$$x_{im} = e_i \quad , (i = 1, 2, ..., n+1) \tag{1.19}$$

$$\sum_{i=1}^{n+1} (x_{ij} + y_{ij}) \leq f_j \quad , (j = 1, 2, ..., m-1) \tag{1.20}$$

$$\gamma_i[(\sum_{j=1}^{m-1} x_{ij})\, \alpha_i + (\sum_{j=1}^{m-1} y_{ij})\, \beta_i] \leq g_i \, , (i = 1, 2, ..., n) \tag{1.21}$$

$$\mu_2 \{\sum_{j=1}^{m-1} [(x_{kj}).\Sigma\, (a^*_j, s^*_j)\, \theta\, (s^*_j \mid n, y_j, a^*_j)] + \sum_{j=1}^{m-1} (y_{kj}).\mu_1\, \Sigma(s^*_j, s^*j).$$
$$\theta\, (s^*_j \mid n, y_j, a^*_j)]\} \leq g_k \tag{1.22}$$

The preceding multi-objective program reflects the conflict of interest that exists between the principal and the agent. The model shows this conflict by separately formulating the objective function of the principal and the agent subject to certain constraints. In these situations and given limited resources, no single optimal solution exists that maximizes both the agent's and the principal's objectives. Thus, the principal must make a tradeoff to achieve the different objectives. This tradeoff not only affects the value of each objective function, but it also changes the manpower planning schedule of the firm. That is, as a result of hiring new labor, the principal may have to reschedule and shift the assignments of some auditors currently employed. But this

sort of adjustment is the essence of organizations. As Fama [1980] notes, although the individuals' objectives within a firm usually both coincide and conflict, it is to their advantage to cooperate in performing the different duties delegated to them.

IV- The Application Of The Agent-Principal Model

The Principal's Model

To formulate the principal's model (equations 1.4 through 1.9), the author hypothesized a CPA firm consisting of eight individuals performing six different activities (for example, auditing, preparing taxes, providing management advisory services, computer services and engaging in professional development). Consequently, the author assumed that the principal had made the assignments to the eight individuals, as depicted in Table 1, and the information regarding each auditor's regular hours, overtime, professional activity, bonus, and regular hourly rate would be provided to principal by the firm's accounting information system as shown in Table 2.

The amount of revenue is not known with certainty. It is subject to the fee that each auditor charges his clients for each revenue generating activity and to the effort to recruit new clients. If "no effort" is made to find new clients, each auditor would charge his prospective clients a fixed amount per hour for each activity. If the effort to recruit new clients is successfully made and new clients are found, the auditor would charge his prospective

clients a certain amount higher than in the "no effort" case. If the effort is made but no new clients are found, the auditor would

Auditor	(1)	(2)	(3)	(4)	(5)	(6)
1	$(x,y)_{1,1}$	$(x,y)_{1,2}$	$(x,y)_{1,3}$	$(x,y)_{1,4}$	$(x,y)_{1,5}$	$x_{1,6}$
2	$(x,y)_{2,1}$	0	$(x,y)_{2,3}$	$(x,y)_{2,4}$	0	$x_{2,6}$
3	0	$(x,y)_{3,2}$	0	$(x,y)_{3,4}$	$(x,y)_{3,5}$	$x_{3,6}$
4	$(x,y)_{4,1}$	0	0	$(x,y)_{4,4}$	0	$x_{4,6}$
5	0	$(x,y)_{5,2}$	$(x,y)_{5,3}$	0	$(x,y)_{5,5}$	$x_{5,6}$
6	$(x,y)_{6,1}$	0	0	$(x,y)_{6,4}$	0	$x_{6,6}$
7	$(x,y)_{7,1}$	0	$(x,y)_{7,3}$	0	$(x,y)_{7,5}$	$x_{7,6}$
8	0	$(x,y)_{8,2}$	0	$(x,y)_{8,4}$	0	$x_{8,6}$
Total Standard Hours Estimated for each activity	$\sum_{i=1}^{8} (x,y)_{i,1} = 3,040$	$\sum_{i=1}^{8} (x,y)_{i,2} = 3,800$	$\sum_{i=1}^{8} (x,y)_{i,3} = 3,000$	$\sum_{i=1}^{8} (x,y)_{i,4} = 3,800$	$\sum_{i=1}^{8} (x,y)_{i,5} = 4,000$	$\sum_{i=1}^{8} x_{i,6} = 760$

Professional Activity

Revenue Generating Activities

Table 1- Matrix Of Auditors' Assignments And The Standards Hours (Per Year) Of Each Activity

charge the same amount as in the "no effort" case, minus the cost of the effort. Then, given prior probability and additional information provided by the accounting system, the expected fee

Table 2

Accoonting Information Relating to Each Auditor's

Activities For The Coming Period

Auditor	Min Reg Hrs/Yr	Max Overtime Allowed Hrs/Yr	Reg. Hour Rate($)	Overtime Rate per Hour($)	profes-sional* Hours/Yr	Bonus** percen-tage	Max Bonus per/Year ($)
1	2,000	500	30	45	60	10%	8,000
2	2,000	450	26	39	80	7%	6,500
3	2,000	450	20	30	80	6%	5,000
4	2,000	400	18	27	100	5%	2,300
5	2,000	400	18	27	100	5%	2,300
6	2,000	400	18	27	100	5%	2,300
7	2,000	350	16	24	120	4%	2,000
8	2,000	350	16	24	120	4%	2,000

* Professional hours are part of the total regular hours available for each auditor, and their rates are the same as their respective regular hourly rates.

** A bonus is based upon the total salary of each auditor; it is derived from total regular and overtime hours that devoted to revenue generating activities multiplied by the respective rates per hour.

each auditor would charge his prospective clients per hour for each activity would be determined. Thable 3 summarizes these expected fees, and the detailed information appears in appendix I.

Having determined the expected fee each auditor will

Table 3

Summary Of The Auditors' Expected Fee Per Hour

Auditor	Audit Activity				
	(1)	(2)	(3)	(4)	(5)
1	64.7	72.1	67.3	76.1	78.1
2	60.2	0	66.0	74.5	0
3	0	70.1	0	74.1	75.6
4	62.7	0	0	73.1	0
5	0	68.5	65.3	0	72.6
6	59.0	0	0	73.1	0
7	48.5	0	56.8	0	71.5
8	0	59.2	0	59.1	0

charge his clients for each activity, one can apply the information presented in Tables 1, 2 and 3 to equations 1.4 through 1.9 This process produces a linear model with one objective function, thirty-seven constraints, and ninety-two variables (1×37×92 model). Consequently, the author used the Mathematical programming System (MPS) computer program to obtain each auditor's optimal scheduling assignment for each activity, and the total regular and overtime hours each auditor should perform during the coming period in order to attain the designated objective. Table 4 summarizes this information.

Table 4 reveals, among other things, that the overtime hours being devoted to activities 3 and 4 are higher than for the other

Table 4 Optimal Assignment Schedules Of Each Auditor And Each Activity Before Hiring New Auditor

Auditor	Activity(1)		Activity (2)		Activity(3)		Activity(4)		Activity(5)		Activity(6)
	Reg*	O.T.**	Reg	O.T.	Reg	O.T.	Reg	O.T.	Reg	O.T	
1	724	0	0	0	0	0	0	0	1,216	484	60
2	0	0	_____		1,150	450	770	0	_____		80
3	_____		1,570	0	_____		280	450	70	0	80
4	1,900	400	_____		_____		0	0	_____		100
5	_____		0	0	1,900	400	_____		0	0	100
6	0	0	_____		_____		1,900	400	_____		100
7	0	0	_____		0	0	_____		1,880	350	120
8	_____		1,800	350	_____		0	0	_____		120
_____	_____		_____		_____		_____		_____		_____
Total	2,624	400	3,450	350	3,050	850	2,950	850	3,166	834	760

*Regular hours

**Overtime hours

activities. Consequently, one can assume that management should hire a new agent to work on these two activities.

The Agents Model

To formulate the agent's objective function (equation 1.10), the author assumed that the agent's service would be required for performing activities 3 and 4 designated by the principal. The agent's revenue (expected fee) for undertaking both activities 3 and 4 is a function of the action and effort the agent will exert. The agent's actions, effort levels, and effort probabilities (prior and posterior) appear in Thable 5.

Table 5

The Agent's Decision Model Of His Expected Fee Per Hour

	States of Nature				Expected
	High Effort (HE)		Low Effort (LE)		Fee
Prior Probability	0.80		0.20		
Additional Information	HE 0.90	LE 0.10	HE 0.14	LE 0.86	
Actions	Fee		Fee		
Employed	$14		$12		
Not Employed	0		0		
					$13.58

Table 5 shows that among the set of actions available to the

agent, he may select two: employment or unemployment. If the agent is not employed, he gets nothing. If he is employed and he exerts a "high effort" in performing activities 3 and 4 delegated to him, he would receive $14 per hour. If he is employed and exerts a "low effort" in performing activities delegated to him, he would receive $12 per hour. Assuming the agent assesses the prior and posterior probabilities of "high effort" and "low effort" shown in Table 5 according to his own private information and accounting information provided by the principal, the agent's expected fee would be $13.50 per hour.

Assuming the contract under negotiation specifies (a) an overtime rate of 1.5 of the regular hourly wage, (b) work totalling 2,000 regular hours during the coming period including 120 hours devoted to professional activity, (c) a maximum of 350 hours of overtime a year, and (d) an eight-percent bonus based upon a salary consisting of the regular and overtime hours spent on the revenue generating activities of the firm (up to a maximum bonus of $3, 200 a year), the author used equations 1.10 through 1.14 to formulate the agent's model. In essence, one objective function and four constraints were constructed.

Having formulated the agent's decision model, it remains for us to examine its effect on the principal's model. The author performed this investigation first on the (Z_1) objective function by developing the decision model presented in Table 6. This table reflects the principal's perception of the new auditor's ability to

increase the contribution margin of the firm by working on activities 3 and 4. Consequently, the principal's objective function and related constraints were modified to incorporate additional information about the hiring of the new auditor; and using formulas 1.15 through 1.22, labor's deision model was incorporated into the principal's model. This process produced a multi-objective model consisting of two objective functions, 41 constraints, and 102 variables.

V- The Solution Procedure And Results

To solve management's model, the author used the method of constraints. This technique begins by optimizing each objective function individually. It proceeds by optimizing one objective while constraining all other objectives to values that fluctuate through a range of feasible solutions. The values of the constrained objectives are determined by processing a series of sensitivity analyses. That is, the user specifies the objective that should be parameterized, the range over which it should be parameterized, and the increments associated with that range at which new solutions should be reported. If the change the user specifies is enough to destroy the optimality of the current basis, a series of iterations are derived until a new optimal solution appears. This process continues until the range of sensitivity analysis the user has specified is achieved or until additional changes in the parameter cause no further variation in the basis.

Table 6- The Principal's Estimate Of The New Auditor's Expected Fee Per Hour

		States of Nature		Expected Fee
		New Clients (N.C.)	No New Clients (N.N.C.)	
	Prior Probability	0.70	0.30	
	Additional Information	N.C. 0.92 / N.N.C. 0.80	N.C. 0.20 / N.N.C. 0.80	
	Actions	Fee	Fee	
Activity 3	High Effort	$50	$38	
	Low Effort	40	40	43.*20
	Additional Information	N.C. 0.91 / N.N.C. 0.09	N.C. 0.12 / N.N.C. 0.88	
	Actions			
Activity 4	High Effort	$46	$34	
	Low Effort	35	35	$39.*40

* Information Costs are Assumed to be $4 for Activities 3 and 4, Respectively.

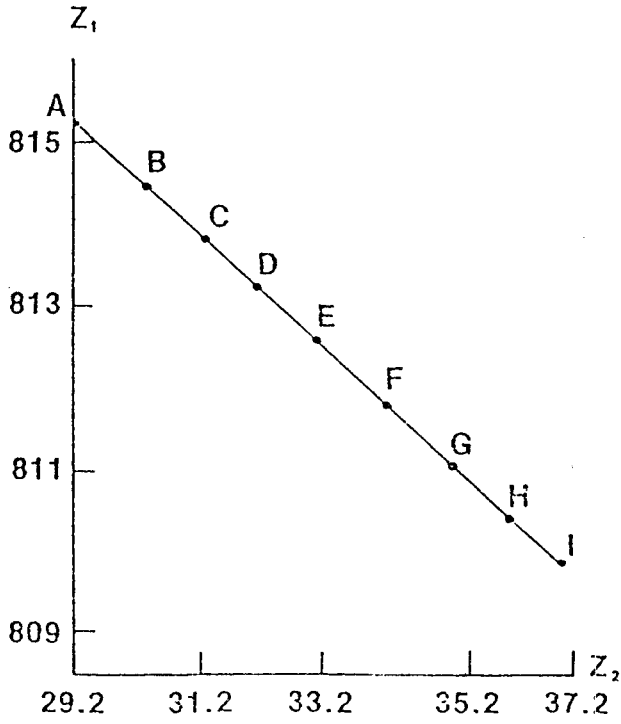
Maximizing (Z_1) and (Z_2) individually provided a unique optimum solution for each objective, with Z_1 = \$815.3x10^3 and Z_2= \$ 36.9x10^3. These solutions are labeled (A) and (I), respectively, in Figure 1. Consequently, the author selected (Z_1) arbitrarily for optimization and constrained labor's objective function; that is,

$$\begin{aligned} &\text{Max } Z_1 (X) \\ &\text{Subject to } X \varepsilon M \\ &Z_2 \leq N \end{aligned} \qquad (1.23)$$

where (M) denotes the set of feasible solutions and (N)represents lower bound on (Z_2) objective function. Since only two objectives are presented, one can simply observe that (N) must be less than 36.9x10^3 (the maximum of Z_2) for feasibility and greater than or equal to 29.2x10^3 (the value of Z_2 at the maximum of Z_1 that gave a pareto - optimal solution) to ensure pareto-optimality.

With the range 29.2x10^3 ≤ N ≤ 36.9x10^3 determined, a step size of 10^3 was chosen for the sensitivity analysis of (N), solving the problem in 1.23 for N = 29.2x10^3, 31.2x10^3 ..., 36.2x10^3. This was achieved with a parametric variation of the right side of the constraint on (Z_2) using the MPS computer program on an IBM. As a result solutions labeled (B) through (H), in Figure 1, were found. A summary of the solution procedure appears in Table 7.

Figure 1 suggests that a good deal of useful information can be utilized by management in the labor negotiation process. First,



Fiaure 1. The Pareto-optimal Solutions Set in Objective Space for the Agent-Principal Problem

it reflects the fact that the maximum and minimum amounts the new auditor can receive are \$ $36.9x10^3$ and \$ $29.2x10^3$, respectively. This information, in effect, provides a monetary basis for accepting or rejecting labor's offer, and it establishes a basis upon which a suitable contract can be installed.

Second, management can actually choose any point from the non - inferior set because all solutions are efficient. In other words, under these circumstances, no single

Table 7

Summary Of Solution Procedure And Its Results

For The Agent-Principal Problem

	Z_1 $(000)	Z_2 $(000)	Dual Variable	Solution
Maximize Z_1	815.3	29.2	—	A
Maximize Z_2	809	36.9	0.71	I
Sensitivity Analysis				
$29.2x10^3 \leq N \leq 36.9x10^3$	814.6	30.2	0.68	B
Step Size = 10^3	813.9	31.2	0.68	C
	813.2	32.2	0.68	D
	812.5	33.2	0.68	E
	811.8	34.2	0.68	F
	811.2	35.2	0.71	G
	810.4	36.2	0.71	H

pareto-optimal solution leads automatically to a maximization of the principal's objective functions. Instead, a set of pareto-optimal points provides relevant information for choosing the most desirable solution. But in moving from point (A) to point (I) the dual variables associated with the objective (Z_1) change from 0.68 to 0.71 at point (G). These dual variables describe the tradeoffs between objectives (Z_1) and (Z_2) at different solutions. For example, at point (B) an increase of $ 1,000 in objective (Z_2) would result in a $ 684 decrease in objective (Z_1). By contrast, the same increase for objective (Z_2)at point (G), would decrease the value of the objective (Z_1) by 716. Thus, these tradeoffs provide

additional useful information about the sensitivity of labor's proposal and its effect on the firm's operations. It is, therefore, imperative to consider this information before selecting the most desirable pareto-optimal point and, hence, the specific pareto-optimal contract to be offered to labor.

Third, Figure 1 shows in a concise way the conflicts between management's objective and labor's goal. As we move along the noninferior set from point (A) to point (I), labor's maximization objective continually increases at the expense of the principal's objective function (Z_1). This shift suggests the sacrifices that management must make before reaching an employment agreement with a new auditor.

It is important to consider the relationship between objectives (Z_1) and (Z_2) more closely at each pareto-optimal solution. Table 8 shows additional information useful in selecting the most relevant pareto-optimal solution. Specifically, it reflects the optimal scheduling assignments of each auditor, given different pareto-optimal solutions. These solutions represent the pareto-optimal incentive contracts that can be presented to a new agent. From this set of solutions, management must select the point consistent with its preferences.

Note that in generating the set of pareto-optimal solutions, it was not necessary to specify management's utility function before deriving the different pareto-optimal points. The manager's utility function plays a crucial role only after all optimal solutions have

Table 8

Optimal Schediuling Assignments Of Each Auditor For

Different Points In The Pareto-Optimal Set

		Points on Pareto - Optimal Transformation Curve							
	A	B	C	D	E	F	G	H	I
$x_{1,1}$	740	740	740	740	740	740	740	740	740
$x_{1,5}$	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
$x_{2,3}$	290	245	199	154	108	63	20	20	20
$x_{2,4}$	1,630	1,675	1,721	1766	1,812	1,857	1,900	1,900	1,900
$x_{3,2}$	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1350
$x_{3,5}$	570	570	570	570	570	570	570	570	570
$x_{4,1}$	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900
$x_{4,1}$	400	400	400	400	400	400	400	400	400
$x_{5,2}$	570	570	570	570	570	570	570	570	570
$x_{5,3}$	1,330	1,330	1,330	1,330	1,330	1,330	1,330	1,330	1,330
$y_{5,3}$	400	400	400	400	400	400	397	352	320
$x_{6,4}$	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900
$y_{6,4}$	270	225	179	134	88	43	0	0	0
$x_{7,5}$	1,880	1,880	1,880	1,880	1,880	1,880	1,880	1,880	1,880
$x_{7,5}$	350	350	350	350	350	350	350	350	350
$x_{8,2}$	1,880	1,880	1,880	1,880	1,880	1,880	1,880	1,880	1,880
$x_{9,3}$	1,880	1,880	1,880	1,880	1,880	1,880	1,880	1,880	1,880
$y_{9,3}$	0	45	90	136	182	227	272	318	350

been identified. In effect, the method of constraints benefits managerial accountants engaged in the labor negotiation process. Since this technique requires no **a priori** assessment of the manager's utility function, managerial accountants can simply employ this optimization model to produce optimal solutions and then present the generated results to management in order to select the most desirable point consistent with its utility function.

VI- Further Extenstion of The Principal's Model

Previous sections characterized the principal's objective function, before considering labor's objective, as a single objective model. This section extends the principal's model to situations in which several objective functions are presented to a principal prior to establishing an employment contract with labor.

His multiple objectives requires a principal to select a finer accounting information system. This accounting system should, in effect, provide relevant information concerning different objectives a principal must explicitly consider, evaluate, and satisfy. Since an unlimited number of different incompatible objectives may be presented to principal, he must explicitly attempt to formulate and to isolate the most important ones. Having determined the set of significant objectives of the individuals within the firm, if the principal wishes to initiate an employment contract, he must identify those predetermined objectives that will be significantly affected by establishing an

employment contract with a new agent. The selection of these objectives, however, depends upon the nature and characteristics of the firm involved in the contractual agreement process. For example, employment of new labor at a manufacturing firm will most likely cause some changes to appear in the product mix, capital budgeting, labor costs, the cost of goods produced, and the net income of the firm. In effect, among the set of different objectives presented to a principal, only those objectives that reflect preceding variables must be formally incorporated into the principal's model in order to investigate accurately the effect of hiring a new agent on the firm's operations and its individuals.

In this section, to present the multi-objective nature of the hypothetical CPA firm discussed earlier, and to determine the pareto-optimal contractual arrangements between an agent and principal, the author incorporated an additional objective into the principal's model. This objective is the maximization of the bonus offered to individuals within the CPA firm (Z_3). The author selected this objective, from among others, because the employment of new labor would probably affect the welfare of other individuals and, therefore, the bonus they might receive. Mathematically, we have

$$\text{Max } z_3 = \gamma_i \left[\left(\sum_{j=1}^{m-1} x_{ij} \right) \alpha_i + \left(\sum_{j=1}^{m-1} y_{ij} \right) \right] \beta_i \,, \quad (i = 1, 2, \ldots, n+1) \qquad (1.24)$$

By incorporating equation 1.24 into the principal's program (formulas 1.15 through 1.22) a Multiple Objective Linear programming (MOLP) model with three objectives was developed. Using the constraints method, the range of objective (Z_3) was determined ($22.9x10^3 < Z_3 < 25.4x10^3$). Consequently, ($Z_1$)was selected arbitrarily for maximization, and (Z_2) and (Z_3)were constrained. A step size of $2x10^3$ and 10^2 was chosen for the sensitivity analysis of objectives (Z_2) and (Z_3), respectively. Accordingly, different pareto-optimal solutions whose objective values appear in Figure 2 were found.

Figure 2 reveals a good deal of useful information management can use in the agent-principal contractual process. First, it exhibits the relationship between labor's objective (Z_2) and the principal's objectives (Z_1) and (Z_3). This relationship has been shown for different levels of the objective (z_2). For example, if labor is offered a contract which provides a total of $ 36,200, the maximum value of objectives (Z_1) and (Z_3) would be $ 810,450 and 25,430, respectively. By contrast, a contract that designates a sum of $ 29,200 for labor, would produce a maximum of $ 815300, and $25,480 for objectives ($Z_1$) and ($Z_3$), respectively. This information, in effect, provides a basis for a principal to determin accurately the maximum and minimum amount that can be rendered to labor, and it enables a principal explicitly to investigate the monetary effects of each alternative contract on its objectives and the firm's operations.

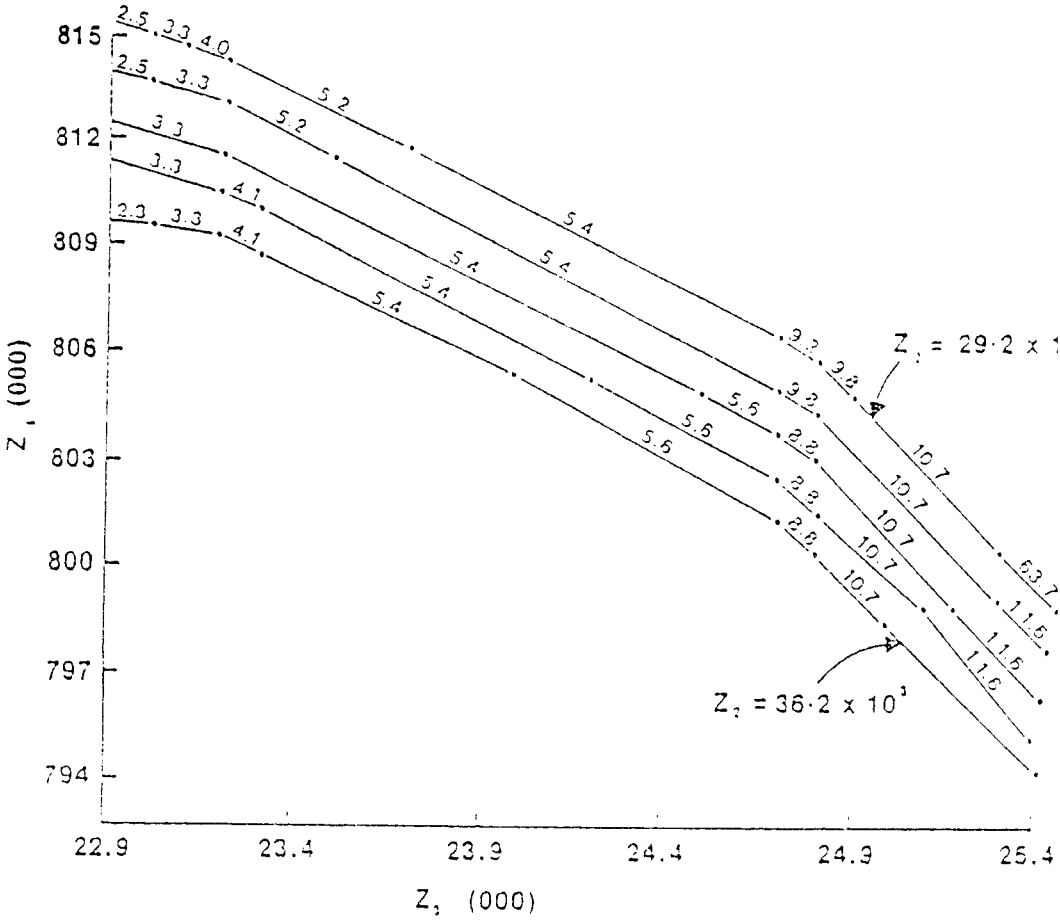


Figure 2. Pareto-optimal Objective Values for Agent-Principal Problem With Labor's Objective Values of $29,200 , $33,200, $35,200, and $36,200 respectively

Second, Figure 2 illustrates the different tradeoffs (shadow prices) associated with each alternative contracting arrangement. These trade-offs demonstrate the amount of one objective that must be sacrificed in order to obtain another objective. They are

varied for different levels, and along each level, of the objective (Z_2) indicating the variations of the sacrifices a principal must make to increase labor's objective. Hence, they provide additional information useful for establishing contractual relations.

Third, Figure 2 shows the set of pareto-optimal solutions for the designated levels of the objective (Z_2). From this set, a principal may decide to select a contract providing labor with, say, $ 33,200. The selection of a particular pareto-optimal contract among the set of efficient contracts, however, depends upon the principal's preferences.

Although Figure 2 may be sufficient for a principal to choose the optimal solution - that is, to select the most desirable contract among the pareto - optimal set - the value of each decision variable at each optimal solution can also be determined. These values can be summarized in a table similar to Table 8 to assist a principal further in selecting the pareto-optimal contract. Such a table would show precisely the optimal assignments of each auditor, given each alternative contractual arrangement and would, therefore, facilitate the principal's decision making process by providing additional useful information.

VII- The Implications Of This Study For Accounting

This study has three significant implications for accounting: First, it discusses the function of accounting information in labor -

management contractual relations; second, it extends the results of the reported research in agency theory and contractual agreement literature to situations in which the principal's model is formulated in terms of multi-objective, multi-person criteria; and third, it introduces a multi-objective technique which can be employed by managerial accountants not only when they are involved in contractual negotiations, but also when they are faced with other multi-criteria decisions. Each of these implications is discussed in detail below.

VII- (1) Internal and External Reporting of Accounting Information

The information economics studies are concerned with the optimal value and the functions of accounting information that an individual employs in making uncertain economic decisions. The contractual agreement literature has extended that analysis to situations where there exist at least two individuals who jointly utilize accounting information in order to make their economic decisions. In labor-management contractual agreements, accounting information plays significant internal and external roles.

In any given firm, in order to design pareto-optimal employment contracts, management must utilize accounting information internally. The internal production of efficient accounting information is facilitated by the fact that management

controls the design and structure of the accounting information system, so it has direct access to the accounting information (signals). Furthermore, management can make a proper decision, internally, concerning the type, form and frequency of the accounting reports that are required to establish optimal employment contracts. Having authority over the installation of the accounting information system and maintaining direct access to accounting data increases management's chances of receiving efficient accounting information. The internal receipt of efficient accounting signals, in effect, increases management's chances for designing pareto-optimal employment contracts.

The potential employees, on the other hand, lack authoritative control over the design and use of accounting information systems; having no sovereignty over the accounting information systems, they must simply rely on the limited external accounting information controlled by management. A potential employee's lack of control over the design of accounting systems and his access to only a relatively few accounting signals would bring about an aysmmetry of information between him and management. This asymmetry of information, then, might lead to the establishment of an inefficient (non-pareto-optimal) contracts.

This study, undertook to identify clearly the internal and external functions of accounting information and to investigate its significance in attaining pareto-optimal contracts. The analysis proceeded first by separately formulating the agent and principal

objective functions and constraints according to extant accounting information; and second by analyzing the interaction effects of the agent and principal models. The study showed that the achievement of the pareto-optimal contract depends upon the degree of fineness of the accounting information systems. Thus, the major implication of this study is that the achievement of a pareto-optimal employment contract requires that the internal and external reporting of accounting information is made effectively and simultaneously.

This finding implies that in real situations, the role of accounting information in establishing employment contracts is vital and must be taken seriously. Managerial accountants must strive to maintain their professional integrity and skill to ensure that accurate, timely, reliable, and relevant informantion is provided not only to management, but also to potential employees (or their representative labor unions).

VII- (2) Extending the Results of the Agency Theory to Multi-Objective Settings

The reported research in agency theory and contractual agreement leaves many issues to be discussed if the results are to be applied to labor-management contractual agreements. Among these open issues are first, the fact that the analyses are based on a single agent-principal model; second, the fact that only one objective is allowed for both the agent and principal; and third,

the fact that no attempt has been made to operationalize the agency model by considering the different constraints required to formulate the agent-principal model (that is, the principal objective function is subjected only to the agent's objective function).

This study takes a step towards eliminating the preceding limitations, hence narrowing the gap between the positive and normative approaches by considering separately the agent-principal model under the assumption that the principal is faced with multi-objective decisions. It was shown that if the firm's accounting system provides relevant information to formulate the agent-principal model explictly, the manager (or principal) can develop a flexible plan that delineates the values of different objectives and their tradeoffs. This flexible plan, in effect, provides management with the relevant information necessary to select the pareto-optimal point that would optimize the welfare of both parties.

In turn, given the information presented in the flexible plan, managerial accountants can investigate the effects of a given contract on other objectives and on the operations of the firm as a whole. Also, by using sensitivity analysis, and a mathematical technique known as "the method of constraints," they can determine the maximum and minimum values of each objective and the constraints along with the other critical elements of the agent-principal model. Thus, the accounting control system of a

firm could be extended to incorporate these values explicitly in the model. The range of each objective function and different constraints explicitly incorporated in the accounting system would, in essence, make it possible to establish a basis from which significant variances could be investigated.

Furthermore, the information derived from the points of the pareto - optimal transformation curve (shown in Table 8) provides the optimal work assignments of each individual within the firm. It also shows the optimal work assignmtnt of the new agent, given different pareto-optimal points of the flexible plan. In the case of the CPA firm, it delineates the optimal scheduling assignments of each auditor to each actiity. Thus, this schedule greatly facilitates the manpower plannings of the CPA firms (as well as other organizations, in view of the generalizability of the modol).

Hence, another major implication of this study is the introduction of a model that can be employed by managerial accountants (1) to evaluate quantitatively and systematically the pareto-optimal contract to be offered to new labor, and (2) to solve the firm's manpower planning problem by producing a schedule that assigns the present employees, as well as the new labor, to different tasks within the firm. This model calls for managerial accountants to increase their functions by providing additional quantitative information to management at the time of contractual negotiations. Managerial accountants must endeavor

to fulfill their roles as a significant part of the management team by helping management establish pareto-optimal contracts. If managerial accountants do not make an effort to improve the degree of fineness in accounting information or to provide the additional quantitative information necessary, this crucial task will be performed by other members of the organization, like industrial managers or labor-relations department heads. In the latter case, not only would an inefficient use of the firm's resources result, but also a significant reduction in the importance of managerial accountants as the major producer of the quantitative data in the organization would occur.

VII- (3) Application Areas of the Technique

Accountants are often forced to base their economic decisions on several objective criteria. For example, in transfer pricing decisions, an appropriate transfer price mechanism is selected among alternative methods because of goal congruency, autonomy, and a managerial effort to attain a goal. In capital budgeting decisions, the amount of capital investments, the degree of risk associated with each alternative investment, and returns on the investments are considered as major contributing objectives affecting the selection of a particular project. The product-mix decisions are based on the contribution margin of the products, labor costs, machine hours available, and so forth. Even in establishing a fine accounting system, managerial accountants

must consider such interrelated objectives as the costs and benefits associated with each alternative system, the degree of the fineness of the accounting system, and the significant effects of the chosen accounting system on the decisions of selected users. To accommodate all these decision situations accurately, and to derive a quantitative solution to presented problems, accountants must formulate a multi-objective model.

They can use the multi-objective technique presented in this study to produce the relevant information necessary to derive an optimal solution. Several significant features of the technique follow:

(1) The method of constraints considers the effects of all objectives simultaneously;

(2) it generates the set of all non-inferior solutions;

(3) a decision maker need not have a subjective ordering of goals;

(4) tradeoffs among various objectives do not have to be indicated, because corresponding dual solutions (Lagrange multipliers) provide the required shadow prices; and

(5) the method is inexpensive and computationally efficient [see Dauer and Krueger, 1980]. In effect, not only can the method of constraints be employed in contractual agreement situations, but it is also applicable to such accounting problems as manpower planning, capital budgeting, ascertaining the product mix, maintaining control, and making transfer pricing decisions.

VIII- Summary And Conclustion

The major purpose of this study was to derive the optimal audit staff scheduling of a CPA firm when its manager holds multiple, incompatible objectives and explores the possibillity of hiring a new auditor under uncertain conditions. The author approached this objective by separately formulating each individual's model, by modifying the manager's model, and by systematically determining the pareto-optimal incentive contract that can be established between the agent (auditor) and principal (management) of a CPA firm.

This study shows that when it must establish an employment contract where a variety of non-commensurate objectives are expressed in terms of a linear system, management requires a flexible comprehensive plan that exhibits the tradeoffs between the objectives and the effect of labor's decision model on the operation of the firm. Furthermore, in these situations, no single pareto-optimal solution leads to a maximization of the principal-agent's objective functions. Instead, a set of pareto-optimal points provides adequate information for selecting the most desirable solution and, therefore, the optimal audit scheduling assignments.

Two simplifications, or extenisons, of the agency model presented in this study can be made to reflect the nature of the contractual relations of CPA firms even more accurately. First, if accounting systems do not provide information relating to the

probabilities of the future events, one can base an estimate of the value of desired variables upon current accounting information and other information available at the time of decision. Second, one can incorporate such additional objectives as the minimization of overtime, the minimization of idle time, and the maximization of employee productivity into the agent-principal model. If, however, the model is made to accommodate more than a few objectives, the amount of information presented to management would be overwhelming; therefore, ambiguities and difficulties would arise in the determination, interpretation, and graphic demonstration of the pareto-optimal solutions, and in the audit staff scheduling assignments.

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خلاصه مقاله انگلیسی

کاربرد تئوری نمایندگی در برنامه‌ریزی نیروی انسانی شرکتهای حسابرسی

دکتر محمد نمازی

دانشیار حسابداری بخش مدیریت و حسابداری دانشگاه شیراز

خلاصه

این مقاله مفهوم تئوری نمایندگی را به ساختار قراردادهای چند هدفی تعمیم می‌دهد، و عوامل اساسی مدل نمایندگی را از طریق تعیین قراردادهای بهینه، که بین عامل و مدیر می‌تواند در یک شرکت حسابرسی منعقد گردد، به مرحلهٔ اجرا در می‌آورد. چنین نشان داده می‌شود که اگر مدیر یک شرکت حسابرسی با تصمیم‌گیری در خصوص قراردادهای چند هدفی مواجه است، در صورتی که سیستم حسابداری شرکت اطلاعات لازم جهت مدل اساسی نمایندگی را فراهم سازد، مدیر می‌تواند به طور کمّی تأثیر مالی قرارداد جدید به حسابرس را به عملیات و اهداف شرکت تعیین نماید. همچنین، حساسیت هر نوع قرارداد و مبلغی را که مدیر باید ارائه کند تا به تقاضای قرارداد عامل جامعه عمل بپوشاند، نیز نشان داده می‌شود. در پایان، با توجه به شرایط قرارداد، برنامه‌ریزی بهینهٔ نیروی انسانی برای هر حسابرس و هر فعالیت حسابرسی مفروض تعیین می‌گردد.

این برنامه پویا، تغییراتی را که بوسیلهٔ بکارگیری حسابرس جدید در برنامه حسابرسان دیگر شرکت و در خصوص هر فعالیت ایجاد می‌شود را نیز نشان می‌دهد.