ASSESSING THE FINANCIAL VALUE OF HUMAN RESOURCE MANAGEMENT PROGRAMS AND EMPLOYEE BEHAVIORS: A CRITICAL TOOL STILL COMING OF AGE

Aharon Tziner[1] and Assa Birati[2]
[1)] Netanya Academic College, Israel [2)] Bar-Ilan University, Israel
E-mail: atziner@netanya.ac.il; E-mail: abirati@walla.com

Abstract
This paper highlights investigations into several aspects of the field of economic assessment of human resource management strategies and worker organizational behaviors, both classic and recent. We present the reader with both an historical overview and a review of conceptual and practical developments in this field. It is important to emphasize the influence of the early studies since later financial assessment models were built on the earlier paradigms. The basic thrust of this effort is to encourage the greater employment by managers of quantitative models that allow decision makers to generate all the factors needed to estimate real financial gains and/or losses before any intervention strategy is implemented in the workplace. As indicated, the use of these quantitative models to estimate the net financial gains of using particular intervention strategies or the value of certain types of worker behaviors, can ultimately save companies from making gross tactical errors and, more positively, can assist management in promoting the organization's long-term economic goals with all the incumbent rewards..

Keywords
financial assessment models, worker behaviors, organizational behaviors, cost-benefit analysis, human resource management

JEL Classification
J3; M5

Introduction

It is probably axiomatic to declare that the greatest resource available to companies is the human resource. Effective employees make for effective productivity. Poor operation on the part of the workers can have disastrous consequences for organizations. Thus, human resource research – a vast field that has advanced remarkably in recent decades – is clearly critical towards unraveling the secrets of successful employee behavior within the workplace. In this paper, we focus on two major areas within this field, namely, (1) Human Resource Management Programs and (2) Employees' Organizational Behaviors, with the emphasis on the assessment of the financial value to the organizations of these two elements in the life of the organization and the consequent likelihood of the company's success or failure.
After Boudreau (1983), we can describe utility analysis as a procedure that involves describing, predicting and explaining the consequences of management intervention

programs' options, their desirability, and the decision processes leading to choices among them. There is a long history of research on the best methods of estimating the economic utility of workplace interventions (Boudreau, Sturman & Judge, 1994). Classically, utility estimation methods have been widely applied in the field of personnel selection (Martin & Raju, 1992; Schmidt & Hunter, 1999; Schmidt, Mack & Hunter, 1984). However, building on the classic works, methods of estimating the financial utility of organizational interventions such as personnel testing and training quickly developed (Cascio, 1993). A number of studies have extended the basic utility estimation methods to deal with topics such as rejected selection offers and the use of multiple outcome variables (e.g., Murphy & Shiarella, 1997; Winkler, Köenig & Kleinmann, 2010). Methods for evaluating the financial impact of productivity enhancement programs and of changes in pay policy have also been examined by Klaas and McClendon, (1996), Pritchard (1990) and Roth (1994). Boudreau and Ramstad (2003) have extended this work to assessments of strategic human resource management. Below we examine the contribution of the authors and colleagues to this field.

1. The Need to Assess Financial Value

We should stress that since saving money and cost effectiveness are such important goals, cost-benefit analysis often proves to be the critical tool in enabling employers to estimate the economic utility of any organizational intervention method, or any combination of them, as a means of improving the firm's performance. Moreover, the outcome of a financial feasibility investigation may reinforce, or alternatively call into question, the implementation of the classical procedures in human resource management, where the sole criteria of success have been questions of operational validity. For example, we can cite the issue of assessment centers: Despite evidence of their high predictive validity (Jansen, Melchers, Lievens, Kleinmann, Brandli, Fraefel, & Konig, 2013), the considerable cost involved has cast doubt on the merits of using their services.

This paper highlights investigations into several aspects of the field of economic assessment of human resource management strategies and worker organizational behaviors, both classic and recent.. The basic thrust of this effort is to encourage the greater employment by managers of quantitative models that allow decision makers to generate all the factors needed to estimate real financial gains and/or losses before any intervention strategy is implemented in the workplace. As indicated, these models can ultimately save companies from making gross tactical errors and, more positively, can assist management in promoting the organization's long-term economic goals with all the incumbent rewards.

By way of illustration, let us note, together with Murphy (1993) that organizational damages caused by employee errant behaviors have been valued in the hundreds of billions of dollars annually. Since deviant behaviors in the organization have such critical psychological, sociological, economic and managerial implications (Vardi & Weitz, 2004), this topic has become an extremely important issue and is gaining increasing research attention. The critical importance of estimating the cost of deviant behavior in the workplace is highly represented in this paper. While the total damages of such behaviors to the economy may be nearly impossible to calculate definitively, consider, for example, that employee thefts may account for $38 billion dollars in annual damages for the retail industry worldwide (Center for Retail Research, 2010), and that the overall financial cost resulting from theft by employees in the United States at the turn of the century was estimated at no less than $50 billion dollars per year (Coffin, 2003). Moreover, these damages can directly affect an individual organization's bottom-line. According to some estimates, for example, employee thefts may be responsible for roughly 35% of an

organization's inventory shrinkage, an average of 1.4% of its total revenues (Center for Retail Research, 2010). Thus, considering that organizations operating on profit margins that are under 5% are not uncommon, these losses can be extremely significant.

The importance of the following examples of Utility Analysis lies not only in their illustration of capital savings to companies but also in the demonstration of how the pivotal concepts and attributes linked to each of the phenomena cited can be described in ways leading to the quantification of their economic value to the company anticipating the particular intervention.

In relating to specific areas in the field of human management research, we particularly emphasize, and have consistently introduced in our later investigations, the need to reexamine and revise many of the individual constructs used in earlier mathematical models designed to compute estimates of the utility of organizational interventions or the financial value of various employee behaviors in the workplace .In the classic, seminal investigations, the cost of an intervention program was computed as a function of the direct outlays made to cover the expense of the project, and the estimation of the value of an employee's contribution was based on his or her productivity. In most of the research, the direct costs associated with organizational interventions or human behaviors were computed by means of an additive formula. Most of this earlier research in the field revolved around the issue of staff selection procedures and the resultant utility models – and their consequent refined adaptations were based on these paradigms.

2. Further Studies Illustrating the Rationale, Methodology, and Versatility of the Economic-Financial Approach

In this path-finding paper, Fine (2012) uses the quantitative approach to predict the effect of reducing counterproductive work behaviors (CWB) (the vast financial concomitants of which were described above).

In his discussion on the use of assessment tools to predict CWB, Fine notes several limitations of the classic Brodgen-Cronbach-Gleser utility model as the appropriate tool to measure the financial payoff: (a) the B-C-G formula, in its current format, considers only the performance of those hired, and not of those rejected; (b) CWB is considered to be a unique type of job performance, rather than simply a low level of task performance); and (c) due to the low detection rates of CWB, the extent of individual-level damages may be difficult to quantify in terms of their monetary values. Moreover, Fine stresses that a pivotal challenge is the estimation of the SDy of CWB (in contradistinction to the variety of methods available for estimating the SDy of job performance). Although the economic value of CWB, per se, was well studied by Tziner and Birati (2002), these values were generally studied in terms of their net damages, independent of selection tool validities.

To that end, and in the absence of individual-level models, Fine notes the current group-level methods used to analyze the utility of selection tools for prevented CWB, which have produced significant monetary savings in personnel selection, such as in the case of integrity testing (see; Miner and Capps, 1996). On the other hand, while these methods may indicate utility ex post facto, among other limitations discussed by Fine, they still do not conclusively lend themselves to predicting future utility in new settings among job applicants, prior to the selection tool's implementation.

Estimating the utility of prevented CWB

In the light of this discussion, Fine presents two possible methods for estimating the value of prevented losses, potentially saved by rejecting high-risk applicants using valid selection

tools: (1) the "SDy method" and (2) the "true positive method." The SDy method is based on estimates of the standard deviation of the damages associated with CWB, and the true positive method is based on the mean value of CWB incident. In both cases, for sake of simplification, the value of possible indirect damages caused by CWB, such as lowered morale, reduced cooperation, litigation, and compensation fees were not addressed.

The SDy method. This method is an adaptation of the B-C-G formula that focuses on rejected, rather than hired applicants. The formula is expressed as follows:

Utility (SDy method) = (N * T * rxy * SDy * Zx) — (N * C)/RR (1)

where: N = the number of rejected applicants; T = the average tenure if the rejected applicants were otherwise hired; rxy= the validity of the selection tool used to predict CWB (e.g., integrity tests); SDy = the standard deviation of the monetary damages associated with CWB; Zx = the average standard test score of the rejected applicant group; C = the administration costs per applicant; RR = the rejection ratio (the number of rejected applicants to the number of total applicants).

Fine illustrated this formula in practice in a study of 2,456 Israeli job applicants from 13 large-size organizations operating in eight different industries (e.g., finance, retail, manufacturing, staffing, and technology). In that study, Fine (2010) found a corrected overall validity coefficient of .32 (.26 uncorrected) for an overt integrity test that was measured against self-reported incidents of CWB. Subsequently, subject matter experts (SMEs) from roughly half of the participating organizations (k = 6) were interviewed, in order to calculate a very initial estimate of the SDy of overall CWB. A method based on Schmidt et al. (1979) and Schmidt and Hunter's (1983) techniques was adopted, whereby an average employee's salary was used as a reference point from which the SMEs could estimate the overall damages caused by employees who behave worse than 85% of the employees in the company in terms of CWB (i.e., described collectively as coming late or skipping work without permission, taking home merchandise without permission, damaging property, not adhering to company policy, etc.), compared to the damages caused by an average employee (50th percentile). The mean difference between these two ratings was used as a rough estimate of +1 SD. The results of this exercise found SDy to range between 15% and 75% of an employee's annual salary, with a mean of 45% (SD = 24.3).

Adding some approximate values to the SDy method's formula from Fine's (2012) dataset: N = 313; T= 1 (a default value), rxy= -.32, SDy = $11,250 (i.e., 45% of an average salary of $25,000 year, according to the Israeli Central Bureau of Statistics (2009) from the time of the study); Zx = -1.14; C= $20.00; RR = 0.1274. This yields: (313 * -0.32 * 11,250 * -1.14) — (313 * 20)/0.1274= $1,235,415, or as much as 25 times the invested costs over the three month period of the study. Annualized, this utility is estimated to be approximately $4,941,660 for all of the companies participating in the study, or an average of more than $380,000 each.

Despite its rational appeal and similarity to classical utility models, Fine (2012) concedes that the SDy method is overly simplistic, whereby the primary weakness of this approach is arguably its assumption of normality, especially considering the likelihood that CWBs follows a Paretian (i.e., power law) distribution, thus leading to possible misrepresentations of the prevented damages associated with rejecting low-scoring job applicants. The SDy method is nevertheless presented here as a potential starting point for further research and developments along similar lines.

The true positive method. The second method proposed is a simplification of the previous formula. Instead of the three main variables therein (i.e., Z. SD, rxy), this method: (a) treats the test score as dichotomous (i.e., above/below the test's operational cut-score); (b) estimates the monetary value of CWB as the mean loss due to a specific CWB; and (c) uses

the test's true positive rate for predicting CWB. This method can be expressed using the following formula:

Utility (true positive method) = (N * #y * $y * %TPx) — (N * C) / RR (2)
where: N = number of rejected applicants; #y= the mean number of CWB incidents committed; $y= the mean monetary loss incurred from a CWB; %TPx= the percentage of the test's true positives for predicting CWB; C = the administration costs per applicant; RR = the rejection ratio.
To demonstrate this formula, a mean value for global retail employee theft incidents ($1,944; Center for Retail Research, 2010) was used to roughly estimate y for a subset of Fine's (2010) sample. Specifically, among the study's retail (and retail manufacturing) industry's applicants (N = 566), only 3.0% (N = 17) admitted to having stolen from their past employers, for an average of 1.2 times each. Of these individuals, 47.1% (N = 8) also had low (below cut-score) integrity test scores. Since a total of 69 individuals had low test scores, the test's true positive rate was 11.6%, and its overall utility can be estimated as: (69 * 1.2 * 1,944 * .116) — (69 * 20)/0.1219 = $7,351.
In other words, an annualized utility of $29,404, or a 65% return on the organizations' investment costs. Of course, this represents savings from thefts alone, and these calculations would ideally be repeated and summed for additional CWBs, as they are available.
As Fine (2012) notes, a clear advantage of the true positive model is its simplicity, whereby complex estimations of SDy are not required, relieving managers of the challenges faced by seemingly unrealistically high SDy-based estimates (cf. Latham & Whyte, 1994). In addition, the model is not subject to assumptions of normality, which may be questionable concerning CWB distributions. Moreover, this method lends itself to aggregating the utility gained by several specific types of CWBs, and does not require estimates of overall CWB. Unlike the SDy method, however, this model does not take into consideration the variance (i.e., the individual differences) within the estimates of CWB or the test scores, nor does it consider the true relationship between these two variables (which is naturally continuous, not dichotomous).
Regarding both of the above utility models, Fine makes two final observations. First, the use of more advanced adaptations of the original B-C-G model (e.g, Boudreau, 1983; Tziner and Birati, 2002), which incorporate issues such as taxes, interest rates, tenure and turnover, may substantially influence the utility estimates yielded. Second, due in part to the low detection rates of CWB, attention should be paid to the thorny problem of the false positive rates of integrity tests that have been known to exceed 80% (Karren & Zacharias, 2007). Specifically, it is interesting to consider that in some cases the lost potential productivity from falsely rejected job applicants may actually outweigh the economic utility of prevented CWBs gained from correct rejections.

Second illustration

Tziner and Fine(2012) investigate deviant behaviors based on rational decisions and choices made by an employee (e.g., Vardi & Weitz, 2002) that may be intended to benefit the self or to inflict some kind of damage (Vardi & Wiener, 1996). As with previous illustrations of utility analysis, they introduce mathematical models to address deviant behavior, based on theory and practice. Notably, however, the authors demonstrate a developing trend of an inter-disciplinary approach to utility analysis. Although this study is restricted to the examination of employee behaviors and their employers' reactions, the framework is both innovative and parsimonious, insofar as it models employer responses to

employee's behavioral deviance based on the dual application of an economic theory, namely, Principal-Agent Theory (Jensen & Meckling, 1976) and a psychological theory, namely, Prospect Theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992). The essential behavioral approach employed is based on the fact that all organizations are managed by human beings and, consequently, their decisions are likely to involve psychological biases (see, e.g., Devers, Wiseman & Holmes, 2007).

Within the context of this discussion, a mathematical model is constructed that enables employers to decide when destructive workplace deviance exceeds the financial value of the deviant worker's performance and, consequently, how to proceed with the errant employee. Notably, based on adequate research, the authors assume that employees use financial compensation as the primary basis of equity calculation (see Currall et al., 2005). The model is based on identifiable and identified deviance as a calculated reaction to inequity by a recognized employee, whereby the destructive behavior clearly leads to financial loss that can be traced to that worker. It is a behavioral model that does not touch the ethical or affective antecedents to the errant worker's destructive behavior, so that the motivations and intents of the employee are not the key elements in the decision-making processes touched by the model. The clear linkage between antecedent deviance and severe financial damage implies a usefulness of this model beyond any other considerations.

Significantly, the authors shed light on the dynamics guiding the process of action and reaction of the employer-employee relationship, as the employer is engaged in managing the deviance at work, contemplating decisions concerning the future of the worker, and the loss or gains to the company of maintaining or firing that worker.

The research hypothesizes that the decision of an employer to terminate the engagement with an employee or the employee's own decision to quit is dependent upon the following variables:

(1) The level of an explicit compensation package, (2) the effect of an employee's deviant behavior, (3) the worker's self-perceived quality, (4) the worker's quality as perceived by the employer, and (5) the replacement costs. Specifically, there may be an optimal tolerable level of deviant behavior so that any change from this level may result in termination or voluntary quit. Thus, deviant behavior and the employer's policy are dependent upon a "dead weight" loss generated by the deviant behavior. In this model, the deviant behavior may very well be a rational decision on the part of the employee. Merging Contract Theory and Agency Theory as in Jensen and Meckling's (1976) and Fama's (1980) framework, a number of assumptions are made concerning the proposed model that can be translated into quantifiable terms, which include, for example, the notion that both the employer and the employee ascribe values to the contribution (worth) of the employee, but that they differ in their respective perceptions about what that means. The worker will thus adopt behaviors that "compensate" for the perceived discrepancies.

The authors run through a number of additional assumptions (refer to original paper), then, in order to close in on a working mathematical model, they employ several hypothetical components from Contract Theory that restrict these assumptions, such as, "Raising the level of compensation for an existing employee in order to diminish his level of deviant behavior (as opposed to hiring a new worker) may be optimal for a very limited range over the exiting compensation level". Finally borrowing from Prospect Theory, the authors suggest that an employer is said to maximize a value function consisting of mainly the employee's behavior damage and the cost of replacing the employee upon his dismissal. Once again, using theoretical concepts, mathematical concomitants are generated that reflect the practical aspects of the underling conceptual models, in the last case, generating

a value function that the employer attributes to his errant worker, based on potential gains and losses. Lastly, the authors' model incorporates the proposal that the greater the potential financial loss, the greater the level of deviance and the likelihood of its being detected, and the greater the value of the utility model to the decision makers.

Conclusions

Human resource management research in organizations has advanced remarkably in recent decades. On the conceptual level, a wealth of well-grounded notions of how to effectively conduct activities such as recruitment, staffing, orientation and training, performance appraisal, and career management are now available. In recent years, much has been achieved with respect to conceiving economic approaches to account for the potential costs and benefits of human resource management activities and employee organizational behavior. The seminal works of researchers such as Boudreau and Cascio laid the foundations for the developments that serve this overall development, and served as the basis of this paper.

As we have seen, general accounting notions, approaches, and methods can be applied successfully to the assessment of economic consequences of this kind, as well as to a variety of additional organizational programs for the management of employee behaviors in the workplace, thus adding new perspectives and applications to traditional concepts, both theoretical and practical. The ability to evaluate estimated cash outflows and inflows provides planners with improved diagnostic tools with which to make decisions regarding the utility of their staffing projects, as well as enabling decision makers to choose sensibly from a number of available options. The careful application of accounting notions in the areas described above enhance the calculation of utility payoffs, in most cases attenuating previously inflated and biased estimations made on the basis of earlier versions of utility formulae. Moreover, it has repeatedly been stressed here that these revised utility estimates, computed using the latest quantitative procedures, must be considered within the context of a company's overall budgetary planning, in common with all other critical areas of a firm's functioning. Although not of immediate concern to HR specialists, it should be recalled that their human resource management decisions play a contributory and critical role in advancing the wealth of the shareholders, without whom the firm could not function.

There are indeed limitations to UA analytical models..

Notwithstanding these limitations, utility estimates of the economic worth of employee organizational behavior and of human resource management intervention methods and procedures is an accounting approach whose time has come. The quantitative model reflects a more complete and realistic description of the effect of personnel programs and employee behavior in companies that are increasingly fighting for survival as global competition intensifies. As theoretical definitions of utility are extended, new areas of application are explored, inter-disciplinary approaches are refined, and UA reaches out into the world of unexpected outcomes, the general utility model will continue to be revised and extended. We can thus optimistically look forward to the day when utility estimates of human resource management procedures will become an accepted and conventional tool in corporate management to the benefit of all aspects of society.

Selected References/Bibliography

Boudreau, J.W., 1983. Economic Considerations in Estimating the Utility of Human Resource Productivity Improvement Programs. *Personnel Psychology*, 36, pp.551-576.

Boudreau, J.W., 1988. *Utility analysis for decisions in human resource management* (CAHRS Working Paper #88-21). Ithaca, NY: Cornell University, School of Industrial and Labor Relations, Center for Advanced Human Resource Studies.

Boudreau, J.W. and Ramstad, P. M., 2003. Strategic HRM measurement in the 21st century: From justifying HR to strategic talent leadership. In M. Goldsmith, R. P. Gandossy, & M. S. Efron (Eds.), *HRM in the 21st Century* (pp. 79-90). New York: John Wiley

Cascio, W.F., 1993. Assessing the utility of selection decisions: Theoretical and practical considerations. In N. Schmitt and W. C. Borman (Eds.), *Personnel selection in organizations* (pp. 310-340). San Francisco: Jossey Bass.

Center for Retail Research, 2010. *The global retail theft barometer 2010*. Nottingham, UK.

Coffin, B., 2003. Breaking the silence on white-collar crime. *Risk Management*, 50, p.8.

Cronshaw, S.F. and Alexander, R.A., 1991. Why Capital Budgeting Techniques are Suited for Assessing the Utility of Personnel Programs: A Reply to Hunter, Schmidt, and Coggin (1988). *Journal of Management Studies*, 19, pp.395-412.

Fine, S., 2012. Estimating the Economic Impact of Personnel Selection on Counterproductive Work Behaviors (CWB). *Economics and Business Letters*, 1(4), pp.1-9.

Jansen, A., Melchers, K. G., Lievens, F., Kleinmann, M., Brändli, M., Fraefel, L. and König, C. J., 2013. Situation assessment as an ignored factor in the behavioral consistency paradigm underlying the validity of personnel selection procedures. *Journal of Applied Psychology*, 98, pp.326-341.

Karren, R.J. and Zacharias, L., 2007. Integrity tests: Critical issues. *Human Resource Management Review*, 17, pp.221-234.

Klaas, B.S. and McClendon, J.A., 1996. To lead, lag, or match: Estimating the financial I mpact of pay level policies. *Personnel Psychology*, 49, pp.121-141.

Latham, G.P. and Whyte, G., 1994. The futility of utility analysis. *Personnel Psychology*, 47, pp.31-46.

Murphy, K.R. and Shiarella, A., 1997. Implications of the multidimensional nature of job performance for the validity of selection tests: Multivariate frameworks for studying test validity. *Personnel Psychology*, 50, pp.823-854.

Russell, C.J., 2013. Is it time to voluntarily turn over theories of voluntary turnover? *Industrial and Organizational Psychology: Perspectives on Science and Practice*, 6, pp.156-173.

Schmidt, F.L. and Hunter, J.E., 1999. The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, 124, pp.262-274.

Tziner, A. and Birati, A., 1996. Assessing Employee Turnover Costs: A Revised Approach. *Human Resource Management Review*, 6, pp.113-122.

Tziner, A. and Fein, E.C., 2012. Modeling employees' deviant behavior and employers' reactions: An interdisciplinary approach using principal-agent and prospect theories. *Economics and Business Letters*, 1(4), pp.10-20.

Tziner, A., Fein, E. and Oren, L., 2012. Human motivation and its outcomes. In C.L. Cooper & J.C. Quick (Eds.), *Downsizing - Is less still more?* (pp.103-133). London: Cambridge University Press.

Vardi, Y. and Weitz. E., 2004. *Misbehavior in organizations: Theory, research and management*. Mahwah, NJ: LEA Publishers.