# On Some Internal Auditing Procedures to Verify the Operating Risk Due to Accountancy Errors

*Procedure di Revisione Interna di Verifica del Rischio Operativo dovuto alla Presenza di Errori nella Contabilità Aziendale*

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**Riassunto:** L'esigenza delle aziende di un controllo di tutte le fasi dell'organizzazione, ha condotto a un diffuso impiego di procedure di analisi statistica per l'individuazione di situazioni anomale del sistema. Il lavoro si propone di analizzare alcune procedure per lo svolgimento di revisione interna della contabilità, al fine di minimizzare il rischio della presenza di errori che possano comportare distorsioni ed errate decisioni.

**Keywords:** real risk, auditing sampling, statistical procedures, multiplied tests of hypotheses.

## Abstract

The demands of the firms have led to a wide use of statistical analysis procedures in order to warn the firm situation, to locate the system irregularities, to weigh up an audit, to come to operational or strategic decisions under conditions of uncertainty.

Another characteristic of the present firm organization and of the decision making by the management is the remarkable "dynamism" of the events, due to the markets, of the customers and of the suppliers, and to the use of innovation technical and communications means, that leads to follow the various operations made by the firm, emphasizing at once the irregularities that can give crisis, economic losses or reductions in market share (Chiodini, Magagnoli, 2004).

The purpose of this paper is to examine some suitable procedures for verifying and doing an internal auditing in order to define the error risk that could imply distortions and wrong decisions by the management. The given model is different from the sample techniques that are used in the auditing field in which the sample plans are used to estimate the amount of the accountancy during the time (i.e.: one year), with an inference about the already obtained series of transactions that is assumed as the definite "statistical population". Such assumption could be denoted as "static" or "ex post". On the contrary this study, using as well the same information, follows the data in their development during the time (Brown, Rozeff, 1979) and estimates their behaviour from a "dynamic" point of view, with tests of hypothesis and signals of occurring irregularities, that can be connected with the ones applied in the production processes and known as "control charts" (Montgomery, 2005).

In auditing, both internal and external, the concept of risk is very complex (Teitlebaum, Robinson, 1975), with reference to the different kinds of fraud and their acceptability

that also has a degree of subjectivity. Therefore the study assumes as risk measure, as much as possible objective, the probability of "no signal" when irregularities happen in the natural accountancy condition and hence in terms of a probability of the second kind $\boldsymbol{b}$, in function of the accountancy depart from the standard condition. Thus we define the model of the error rising process in an accountancy book in a regular condition as a Poisson's homogeneous stochastic process with a parameter $p$ and we assume that the conditional distribution of the error random variable $E = Vc - Vr$, due to the difference between the real book value and the recorded value, is distributed with a known law depending on a location parameter $\boldsymbol{q}_L$ and on a dispersion parameter $\boldsymbol{q}_D$, assumed constant. The given check procedure is a multiple test of hypothesis, iteratively applied to the accountancy records that belong to homogeneous classes and referred to a short time space $I_t = (t - \boldsymbol{D}t, t]$, with $\boldsymbol{D}t = 1$, (i.e.: one day), in which $N_t$ accountancy records are available and $n_t$ constant of them are analysed. Then we compare different sampling procedures referred to the distinct ones (marginal), relating to the parameters.

Defined the decisional procedures, based on the sampling dimension and the test significance level ($\boldsymbol{a}$), by means of simulations we estimate the risk in terms of the probability $\boldsymbol{b}$ in function of the possible accountancy irregular conditions.

In particular, the null hypotheses (marginal) are the following:

- $H_0^{(1)}: p \leq p_0$ where $p$ is the frequency of a book error, $E \neq 0$ or ($E^+ > 0$, $E^- < 0$), in $I_t$ period;

- $H_0^{(2)}: \boldsymbol{q}_L \leq \boldsymbol{q}_{L0}$ where $\boldsymbol{q}$ is the average of the book error conditional distribution, $E \neq 0$ or ($E^+ > 0$, $E^- < 0$), in $I_t$ period;

- $H_0^{(3)}: SE \leq SE_0$ where $SE$ is the sum of the book errors, $E \neq 0$ or ($E^+ > 0$, $E^- < 0$), in $I_t$ period;

- $H_0^{(4)}: \boldsymbol{h} \leq \boldsymbol{h}_0$ where $\boldsymbol{h} = SE \Big/ \sum_{j=1}^{N_t} Vr_j$ is the ratio between the sum of the book errors, $E \neq 0$ or ($E^+ > 0$, $E^- < 0$), and the total record values in $I_t$ period.

The values $p_0$, $\boldsymbol{q}_{L0}$, $SE_0$ and $\boldsymbol{h}_0$ are boundary values in the regular conditions of the accounting.

The main results are compared in the different conditions and we remark them in order to suggest some practical uses.

## References

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A bookkeeping and accounting system needs internal control procedures for accounts receivable in order to minimize the risk of fraud, error and loss. The purpose of accounts receivable internal controls is to ensure that sales invoices are properly recorded and that customers pay promptly in accordance with the agreed terms of business. The internal control procedures for accounts receivable checklist below acts as a quick reference, and sets out the most commonly encountered techniques available when dealing with internal controls for accounts receivable. Internal Control Procedures for Accou