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THE SWISS CHEESE MODEL AND EXTERNAL AUDITING (İSVİÇRE PEYNİRİ MODELİ VE BAĞIMSIZ DENETİM)

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ABSTRACT

Reason's Swiss Cheese Model (SCM), which is sometimes called the cumulative act effect, is a model used in risk analysis and management. Even though it has been widely used in aviation, engineering, and healthcare; there is no sample of its usage in the accounting field. This study aims to contribute to the prevention of audit failures by applying the Swiss Cheese Model. It can be hypothesized that audit failures can be attributed to one or more of four levels of failure: executive effects, inadequate oversight, suitable ground for flawed acts, and the flawed acts. Audit firms' countermeasures against failures can be modeled as a series of bulwarks, represented as slices of Swiss cheese. The cavities in cheese slices represent discrete weaknesses in distinct parts of the system and are constantly varying in dimension and setting in all slices. The system, as a whole, produces failures when all of the cavities in each of the slices momentarily align, so that a peril passes through all of the holes in all of the defenses, leading to a failure. Adding more layers of defense—slices of cheese—may help reduce errors and, consequently, failures. This research initiates the literature on the application of SCM in accounting and auditing, thereby contributes to the field.

Keywords: Swiss Cheese Model, Accounting, Auditing, Failures.

JEL Classification: M41, M42, G32

ÖZ

Kümülatif eylem etkisi olarak da adlandırılan Reason'un İsviçre Peynir Modeli (SCM), risk analizi ve yönetiminde kullanılan bir modeldir. Havacılık, mühendislik ve sağlık alanlarında yaygın olarak kullanılmasına rağmen; muhasebe alanında kullanımına ilişkin bir örnek bulunmamaktadır. Bu çalışmanın amacı, denetim başarısızlıklarının SCM'nden faydalanarak önlenmesine katkıda bulunmaktır. Denetim başarısızlıklarının dört başarısızlık seviyesinden bir veya daha fazlasına dayanacağı varsayılabilir: organizasyonel etkiler, yetersiz gözetim, hatalı eylemler için ön koşullar ve hatalı eylemler. Denetim firmalarının başarısızlıklara karşı mücadelesi, İsviçre peyniri dilimleri tarafından temsil edilen bir dizi engel olarak modellenilebilir. Peynir dilimlerindeki delikler sistemin ayrı ayrı bölümlerindeki bireysel zayıflıkları temsil eder ve tüm dilimlerde boyut ve konum bakımından sürekli olarak değişir. Bir bütün olarak sistem, dilimlerin her birindeki deliklerin tümü aynı hizaya geldiğinde, tehdit tüm engellerdeki tüm deliklerden geçerek bir soruna yol açtığına başarısızlığa yol açar. Sisteme ilave peynir katmanları eklemek hataları, dolayısıyla başarısızlıkları azaltabilir. Bu araştırma, bu alandaki literatürü başlatmakta ve böylece literatürün gelişimine katkıda bulunmaktadır.

Anahtar Kelimeler: Swiss Cheese Modeli, Muhasebe, Denetim, Başarısızlıklar.

JEL Kodları: M41, M42, G32

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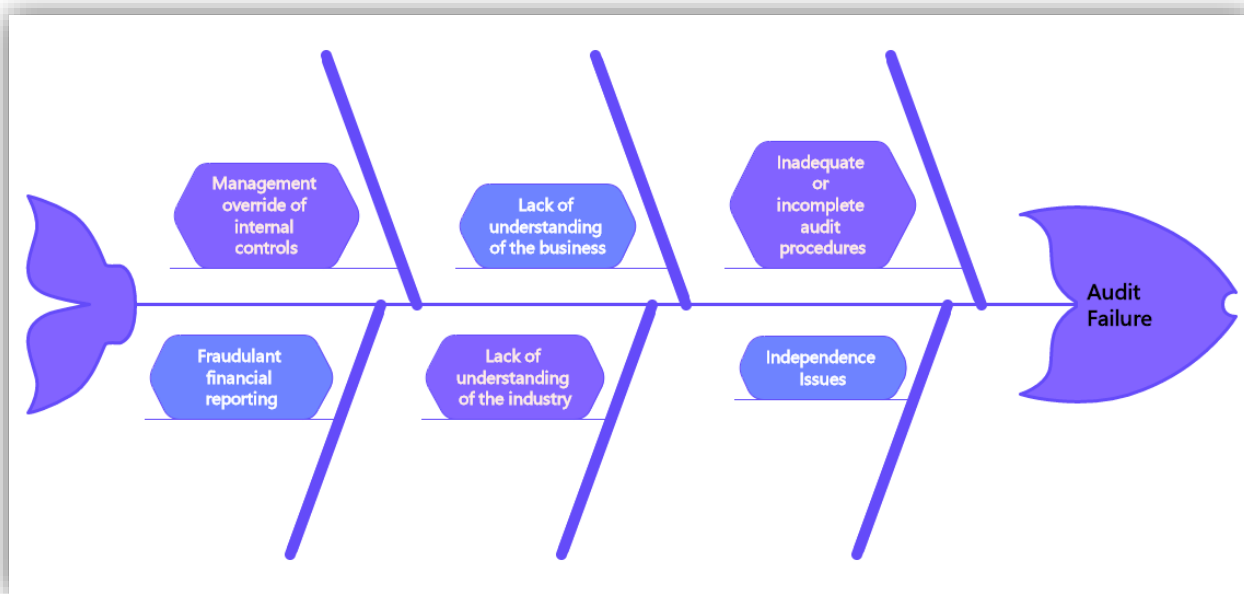
1. INTRODUCTION

Audit's history dates back to ancient civilizations—China, Egypt, and Greece. The ancient checking activities found in Greece around 350 B.C. appear to be closest to today's auditing (Kumar & Mohan, 2015: 43). Fraud—deceit with intent to illegally gain a financial advantage over a person or an entity—also dates back to the 3rd century B.C., when the first cases were seen in Greece (www.fraud.com, 2024). Even though these two overlap, humankind had not been able to find an ultimate solution to prevent fraud. Big steps had been taken since then, but audit failures still persist. This study aims to contribute to the prevention of audit failures by applying the Swiss Cheese Model. Reason's (1997) Swiss Cheese Model (SCM), which is sometimes called as the cumulative act effect (Mayerhofer, 2018; Durgut, 2020), is a model used in risk analysis and management (Shabani et al., 2024). Although it has been widely used in aviation (Mayerhofer, 2018; Durgut, 2020), maritime (Cassama, 2015), engineering (Qureshi, 2023), healthcare (Wiegmann et al., 2022), and psychology (Geraghty, 2023) there is no example of its usage in the accounting field.

Concepts and the Problem

According to the Wallstreetmojo Team (2024), audit failure occurs when an auditor expresses an incorrect opinion on a company's financial statements, while audit success is defined as the auditor providing an accurate opinion. An auditor's inappropriate opinion on a company's financial statements is audit risk and can result in audit failure. In fact, the auditor needs to identify errors in the financial statements, leading to an inaccurate representation of the financial position and performance of the company. Figure 1 displays the possible causes of an audit failure. Independence issues, inadequate or incomplete audit procedures, and understandings of the business/industry are the responsibility of the auditor and the audit firm. Building a system fortified against fraudulent financial reporting and implementing internal controls to prevent/detect material misstatements/errors in financial statements as well, is under the responsibility of the audit client.

Figure 1. Reasons of an audit failure



(Designed by the author based on the text of Wallstreetmojo Team, 2024)

The levels of the fishbone chart in Figure 1 shows the responsibility areas described by the Wallstreetmojo Team. The causes of audit failure may occasionally overlap; however, it is not essential for one cause to coincide with another. The presence of any single cause can still lead to quality issues.

The six most common compliance audit failures (Robinson, 2017) and advices to avoid them by Robinson (2017) and Pompon (2017) are summarized in Table 1.

Table 1. Reasons of and Advices for Audit Failures

	Causes	Advices
1 Poor Prioritization from the Top	Importance of compliance is neglected by management	Information security program has to be aligned with the objectives of the organization.
		The organization's values are to be discovered and cyber risks & control are to be explained accordingly
		Executives are to be involved in these
		Tone of the top makes the difference
2 Lack of Documentation	No document policy	Compliance is to be incorporated into the culture of the organization
		Intentions, policies, standards are to be written and protected with passwords etc.
		Companies should document what they do in written policies. Consistency & constancy is required.
		Everyone is to be trained in the proper procedures
3 Human Error Compounded by Manual Processes	Procedural training not implemented	Performance of controls are to be written
		Automate systems such as user authentication
		Automate systems such as Human Resources & payroll
		Administrator rights must be exclusive for IT professionals. Double-checks are helpful
4 Weak or Missing Risk Assessment	Performance controls not monitored	Probabilities of occurrence of threats are to be included in risk assessments
		Allocate sufficient time & funds for a proper risk assessment
		Improve risk assessment so that resources are spent efficiently
		Independence & objectivity are principal
5 Internal Assessment is Too Self-Congratulatory	Internal assessors overlook important shortcomings	Develop a proper internal audit program
		Hire an independent assessor or have a contracted consultant
		Segregate implementation of the system and the controls
		Follow-up the system for occasional lapses, and keep improving
6 Misunderstanding That Some Audits are Ongoing		Fill in the gaps in control activities
		Make the distinction between point-in-time audits and continuous audits
		Do not just try to make the auditor happy, instead manage your own risk
		Assume the company is audited all the time, and there will be surprise visits from regulators

(Organized from [Robinson \(2017\)](#) and [Pompon \(2017\)](#))

These audit failures are common, and each has its own solution. Compliance with accounting and auditing standards, training, effective management, and professional skepticism are some of the solutions worth mentioning. When audit failures coincide with fraud, disasters occur. As mentioned in the introduction, there are numerous financial crimes to list. Banking and financial services sector is one of the most important of its kind regarding the consequences of audit failures. Audit failures and bankruptcies in this sector cause immense harm to the economy, thus to the society. [Dodd \(2023\)](#) mentions some of audit failures including examples from banking and finance sector:

- **Lehman Brothers** 2008. The global financial services firm hid over \$50 billion in loans disguised as sales.
- **Bernie Madoff** 2008. Madoff and his accountants paid investors returns out of their own money or other investors rather than profits.
- **Saytam** 2009. Indian IT services and back-office accounting firm falsified revenues, margins and cash balances to the tune of 50 billion rupees.
- **Enron** 2001. The energy company kept huge debts from the balance sheet.

- **Treaty of Utrecht 1720.** The Treaty of Utrecht, signed in 1713 between the UK and Spain, allowed Spain to trade in the seas near South America. Barely any trade occurred, but this was concealed on the UK stock market. A Parliamentary inquiry revealed fraud among government members.
- **WorldCom 2002.** Inflated revenues and assets causing 30,000 people losing their jobs, and investors losing \$180 billion.
- **KPMG 2018.** Was fined £2.1 million by the Financial Reporting Council for misconduct in audits.
- **The Kraft Heinz Company 2021.** For years inflated cost savings; agreed to pay a penalty of \$62 million.

2. THE REASONING OF THE MODEL

In order to construct the model, audit failures are to mention first. The reasons causing them, the responsible parties, and the main indicators of audit quality are briefly discussed as follows.

2.1. Levels of the Audit Failure & the Responsible Parties

It can be hypothesized that audit failures can be attributed to one or more of four levels of failure: executive effects, inadequate oversight, suitable ground for flawed acts, and the flawed acts. Audit firms' countermeasures against failures can be modeled as a series of bulwarks, represented as slices of Swiss cheese. The cavities in the cheese slices represent discrete weaknesses in distinct parts of the system and are constantly varying in dimension and setting in all slices. The system produces failures when all the cavities in each slice momentarily align, allowing a threat to pass through every hole in the defenses and resulting in a failure. Adding more layers of defense—slices of cheese—may help reduce errors and, consequently, failures.

Figure 2. Four Levels of Failure Leading to Audit Failures



(Created by the Author)

Four levels of failure leading to audit failures are shown in Figure 2. Before examining these levels, the audit quality impacting factors are to be given first. These factors and explanations to them—where relevant—are given in Table 2. Figure 3 tells us that the auditor is recruited, trained, and assigned to audit teams by the audit firm. However, this does not let us put all of the blame solely on the audit firm in case of a failure; also, the auditor has individual responsibility in audit failures, if it happens.

Figure 3. Actors in an Audit Process



(Created by the Author)

2.2. The Main Indicators of Audit Quality

As seen from Table 2, impacting factors can be grouped into four equal and interrelated categories: (1) audit firm, (2) auditor, (3) audit client, and (4) public authority. The positions of each actor in an audit process are displayed in Figure 3. The level of application or position of each factor apparently affects the audit quality. At the end of the audit process, it is understood whether the quality of the audit is high, low or mediocre.

Table 2. Main Indicators of Audit Quality

Auditing Firm	Organizational Structure	Auditor	Independency
	Collateral Partnerships/Indirect Partners		Abiding by the Laws
	Business Model		Abiding to Standards of Auditing
	Diversity of Services Rendered		Average Years of Experience of Audit Professionals
	Implicit Shareholders		Number of Companies Audited
	Abiding by the Laws		Experience & Knowledge about the Client & Client's Industry
	Abiding to Standards of Auditing		Rotation
	Human Resources Policy and Procedures		Restatement of Opinion
	Quality Control System		Professional Skepticism
	The Impact of Services Rendered upon Independency		Auditor Stress
	Training Policies	Over Self-Confidence	
	Number of Companies Audited	Client	Properties of Board of Directors
	Average Annual Training Hours Per Audit Professional		Properties of Audit Committee
	Annual Professional Staff Retention		The Effectiveness of Internal Control
	Ethics Policies and Procedures		Restatement of Financial Tables
	Independency		Organizational Structure
	Who Pays the Audit Fee		Corporate Governance
	Satisfactoriness of the Fee Earned from a Client		Social Responsibility
	Ratio of Professional Staff to Audit Partners - Leverage		Existence of Performance Based Incentive Premiums
	Time Staff Spend on an Audit		Abiding by the Laws and Standards
Chargeable Hours Per Audit Professional	The Effectiveness of Public Oversight		
Professional Chargeable Hours Managed Per Audit Partner	Public Authority	Peer Review	
Local Bureau/Partner		Autonomy Considering Political Power	
Network Design		Organizational Structure of Public Authorities Related to Independent Auditing	
		Effective Controls	
			Penalizing Persons and Institutions Not Abiding by Laws
			The Structure of the Industry

(Reorganized from Kesimli, 2019 pp. 177–178)

The list of factors impacting audit quality is so extensive that only a select few are included here. The way the parties handle each issue determines the audit quality. Even though each factor is critical and important, still there is room to emphasize some of them. Objectively speaking two topmost factors in each party in my opinion are as follows:

- Public authority: 1. Autonomy and 2. Effective Public Oversight
- Audit client: 1. Corporate Governance and 2. Social Responsibility
- Auditor: 1. Independence and 2. Abiding to Standards of Auditing
- Audit firm: 1. Independence and 2. Ethics Policies and Procedures

Audit failures' resemblance to the organizational accidents mentioned in the SCM will be discussed in the following section.

3. SWISS CHEESE MODEL

According to [Reason](#) (1997), the originator of Swiss Cheese Model (SCM), there are organizational accidents (audit failures in this research's context). These are the comparatively rare, but catastrophic events that occur within complex modern technologies (audit industry in this study). Organizational accidents have multiple causes involving many people operating at different levels of their respective companies. Defense mechanisms are to be developed in order to intercept organizational accidents that cause loss of assets. Defenses need to be continuously improved and developed. Whenever defenses are neglected and/or not fortified, safety margins erode. The consequence of neglecting existing defenses and failing to provide new ones is a much-increased risk of a catastrophic/terminal accident (audit failure in this study). Defenses are devised to (1) derive comprehension and cognizance of the local perils, (2) furnish perceptible road map on how to function securely, (3) equip signals and notifications when a peril is proximate, (4) reinstate the system to a safe condition in an abnormal position, (5) insert safety bulwarks between the perils and the prospective losing, (6) restrain and obviate the perils should they flee this bulwark, and (7) supply the means of avoidance and salvation should peril blockade fail. [Reason](#) explains (1997, 27):

"The 'Swiss cheese' metaphor is best represented by a moving picture, with each defensive layer coming in and out of the frame according to local conditions. Particular defences can be removed deliberately during calibration, maintenance and testing, or as the result of errors and violations. Similarly, the holes within each layer could be seen as shifting around, coming and going, shrinking and expanding in response to operator actions and local demands."

[Reason](#) (1997) is not talking about the accounting world, but this research does. So, the defenses and the reasons why they are developed can easily be adapted to the accounting and auditing world. In the auditing world, as they do in Reason's model, defenses are breached due to the human factors, organizational factors, and technical factors.

Even though Swiss Cheese Model ([Reason](#), 2000) of accident causation is a model used in the risk analysis and risk management of human systems, this research aims to adapt SCM to auditing. However, there is proof that SCM is beneficial to several disciplines. [Qureshi](#) (2023) argues that principles of SCM offer a defense model, which can be applied to quality engineering, specifically software engineering. [Mackay](#) (2020) praises SCM, specifically for communicating risk reduction during Covid times. According to him using lots of layers as advised by the model, increases the chance of preventing transmission of SARS-CoV-2, the virus that causes COVID-19. [Laffin](#) (2021) gives an example from Human Resources (HR) area, where disqualified HR might cause key personnel to resign due to uncompetitive salaries. This is a threat, and HR has to put preventative precautions to stop others to resign. Mitigation of the adverse effects of the event should follow. [Laffin](#) (2021) argues that such a model needs voluminous thinking and work, which is the core of risk management. [ABC News](#) (2005) pictures airline security before and after September 9/11 terrorist attacks as slices of Swiss cheese. Regarding regulatory compliance for the financial services sector in the UK, [Truckle](#) (2021) proposes SCM to be applied. Like the layers of the Swiss Cheese Model, layers of defense to reduce compliance risk in this sector are as follows: (1) Compliance training, (2) Policy attestation, (3) Declarations or disclosures, (4) Compliance registers, (5) Offline training activities, (6) Intelligent learning, (7) Analytical assessment, and (8) Compliance surveys. Regarding ergonomics, [Rashid](#) (2023) introduces a model which establishes the link between the preliminary cognition of potential investigators and their following practical response to an accident. His model reflects the SCM. In his study, [Perneger](#) (2005) tried to determine whether the components of SCM, which is used to analyze medical errors and patient safety incidents, are understood in the same way by quality and safety professionals. He found that further work is required to reach consensus about concepts of patient safety. [Okroy](#) & Lubnau (2004, 20) mention the use of SCM in Crew Resource Management for the fire service. They argue that there are holes in a person's ability to command a fire, and there is nothing to do to eliminate them. Layers of the SCM are hoped to trap the errors mentioned.

[Larouzee](#) & Le Coze (2020) tell the evolution story behind the SCM. The moment when Reason distinguished between errors and violations seems to be a critical point in SCM's journey. Acts based on intention to harm and/or voluntary transgressions of rules/imposed procedures and errors were the basis of his taxonomy of unsafe acts ([Larouzee](#) & Le Coze, 2020, 3). The authors review the main criticisms of the SCM. As understood from their paper, criticisms of the model from (1) scientific angle and (2) economic/commercial angle are to be grouped as (1) criticisms related to its foundations, and (2) criticisms related to its influence on practice. As they quote from Perneger (([Larouzee](#) & Le Coze, 2020, 9);

“...the intuitive understanding and interpretive flexibility of the SCM is precisely what has made it so successful it is also, for some, a fundamental drawback.” This is the reason why this research tries to benefit from the model in accounting and auditing.

The Swiss Cheese Model and Auditing

In the light of the literature reviewed, it is understood that the SCM is useful in many areas. This research sees an opportunity of the SCM to be applied in accounting and auditing. There is enough proof that there are lots of costly failures in the accounting and auditing history. Within the frame of this research, the SCM and auditing is to be discussed here. As an introduction, factors affecting audit quality will be discussed.

Not limited to the ones listed here, samples of audit quality impacting factors originating from public authority are as follows: the effectiveness of public oversight, peer review multiple levels, autonomy considering political power, organizational structure of public authorities related to independent auditing, effective controls, penalizing persons and institutions not abiding by laws, and the structure of the industry. Each one is represented by a slice of Swiss Cheese, which has distinct and famous holes. For example, weak autonomy considering political power is a hole in the slice and in turn will hinder the effectiveness of public oversight. Low quality peer reviews (another hole in the slice) will cause a low-quality audit to be overlooked. Regarding each slice individually and adequately will obstruct acts causing audit failures.

Audit quality impacting factors—not limited to the ones listed here—originating from the audit client are as follows: properties of board of directors, properties of audit committee, the effectiveness of internal control, restatement of financial tables, organizational structure, corporate governance, social responsibility, existence of performance-based incentive premiums, and abiding by the laws and standards. Each one is represented by a slice of Swiss cheese. For instance, performance-based incentive premiums may lead the way to fraud, which in turn may end up with an audit failure. Financial illiteracy of several committee members, who have important roles during many processes, may also cause audit failures, as does the ineffective internal control. Thus, each slice under the responsibility of the audit client needs special attention.

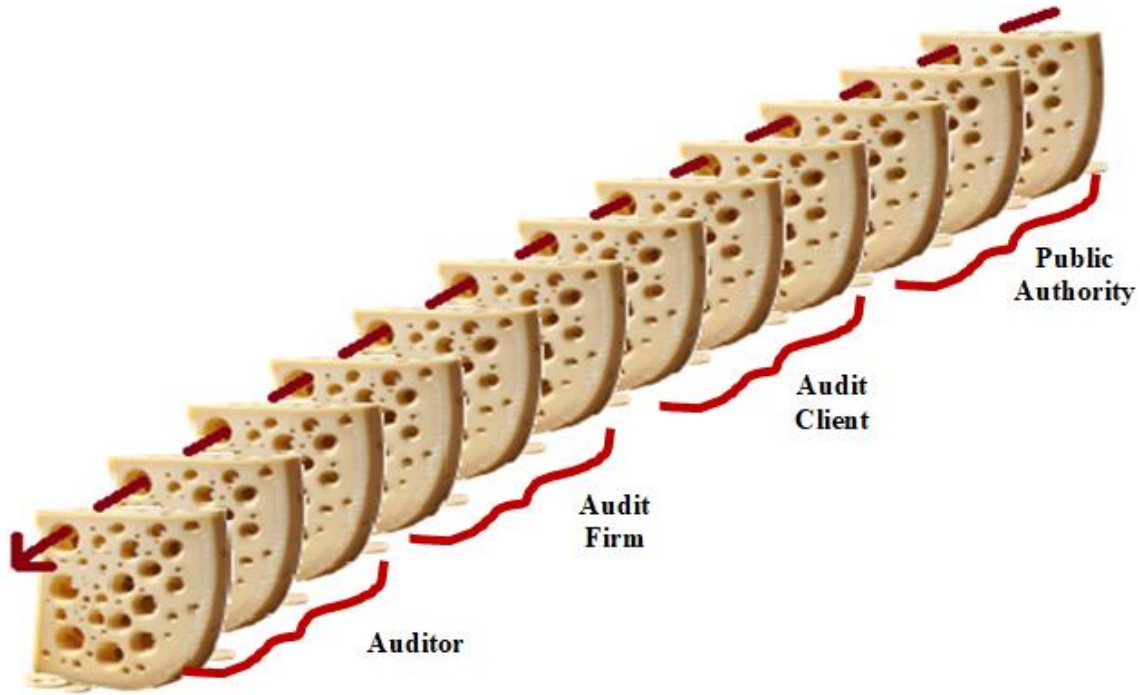
Audit firm is another crucial actor impacting the audit quality. The factors—not limited to the ones listed here—originating from the audit firm are as follows: organizational structure, collateral partnerships/indirect partners, business model, diversity of services rendered, implicit shareholders, compliance with laws, adherence to auditing standards, human resources policy and procedures, quality control system, the impact of services rendered upon independency, training policies, number of companies audited, average annual training hours per audit professional, annual professional staff retention, ethics policies and procedures, independency, who pays the audit fee, satisfactoriness of the fee earned from a client, ratio of professional staff to audit partners—leverage, time staff spend on an audit, chargeable hours per audit professional, professional chargeable hours managed per audit partner, local bureau/partner, and network design. It is understood that there are too many cheese slices under the responsibility of an audit firm. Even though numbers may not always matter, it is apparent that audit firms have the highest impact factor. Moreover, audit firms recruit, hire, train, and appoint the auditors to specific audits. A responsible and professional approach will be helpful in lowering audit failures. Audit firms form audit teams, which perform audit processes.

According to [Sasou & Reason \(1999, 1\)](#), teams rather than individuals perform most of the human work. Among several advantages of the teamwork, mutual aid is the most important. Through teamwork, efficiency and productivity are expected. Teamwork can detect and recover errors; it can also create errors. [Rasmussen \(1990, 454\)](#) proposes that the analyses of the major accidents have concluded that human errors on part of operators, designers or managers have played a major role, and argues that there are several basic problems in analysis of accidents and identification of human error. [Rasmussen \(1990, 454\)](#) emphasizes the relation between learning and adaption, and the concept of error. Had it been traditional stable systems; human errors related to conflicts among cognitive control structures and stochastic variability would have been studied under laboratory conditions. However, today’s flexible and rapidly changing work conditions, together with sociotechnical systems require focusing on resource constrictions that lead to unexpected situations, and influence of human learning and adaptation. This argument is crucial, as analyses of audit failures often reveal human error, regardless of which party is responsible. The scenery may vary, but the errors remain the same. This observation brings us to the indispensable member of the team, the auditor.

Finally, the auditor, who is a member of several audit teams at different times, is to mention. Audit quality impacting factors—not limited to the ones listed here—originating from the auditor are as follows: independency, abiding by the laws; the degree of it—inspections, warnings and penalties if relevant, abiding to standards of auditing; the degree of it—inspections, warnings and penalties if relevant, the average years of experience of audit professionals, number of companies audited, experience and knowledge about the client and client's industry, rotation, restatement of opinion, professional skepticism, auditor stress, and over self-confidence. Independency among them is the most important factor, so it deserves the thickest slice. Professional skepticism, which is probably built up with the help of multi-faceted

experience, occupies another slice. Contingency Theory of Management interferes, and a new set of audit quality impacting factors gains importance under each situation at each time. Every time a hole is clogged, the probability of happenstance of an audit failure decreases. Contingency Theory harmonizes with open systems concept and says that managers act under conditions of uncertainty and risk under varying needs and conditions. Flexibility and openness to change help in coping with change, meet stakeholder's demands, and exploit the opportunities (McFarland, 1979: 15).

Figure 4. Swiss Cheese Model Adopted to Audit Quality



(Created by the Author)

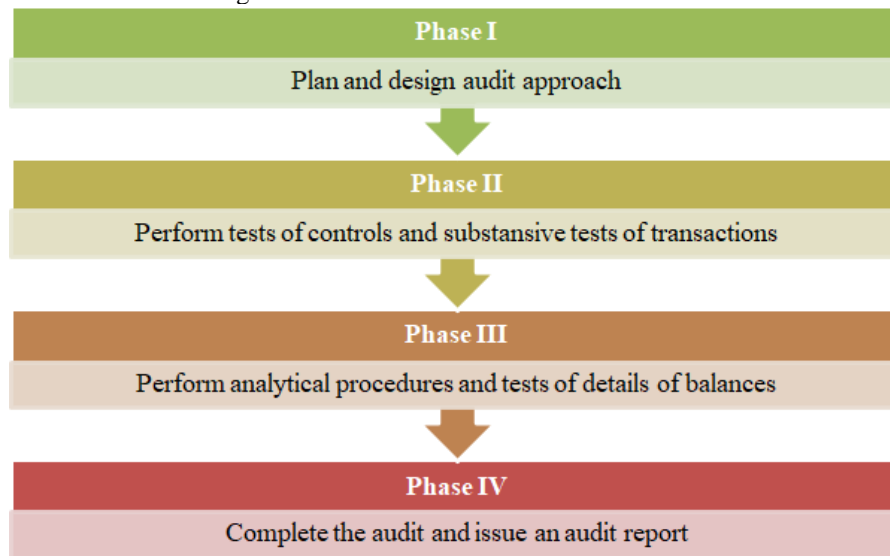
External auditing is one of the areas most affected by globalization. Therefore, public authority in every nation needs to cooperate with its counterparts. In order to form the basis for a healthy auditing industry, standards and legislation are to be internationally compatible. Moreover, public authorities need to take active part in standard making processes. Audit clients, on the other hand, are such a kind of stakeholder, who pays for and benefits from external audit. Audit clients are well aware of the effects of globalization, but it is questionable whether they take their part in responsibility. Governance is the key concept in this scenario.

There are both personal and shared responsibilities. As described above, each party has its own responsibilities, and fortifying the system against audit failures is the individual and mutual duty of each party. The Swiss Cheese Model comes on the scene at this stage. Each responsibility and/or obligation is to be represented by a slice of Swiss cheese. Despite all its holes, that is, its defects, each slice will have a strengthening effect in preventing audit failures. The more layers of defenses, the fortified will be the system.

Audit Process, Its Phases and SCM

An audit process is a methodology for systemizing an audit to make sure that the evidence collected is satisfactory and relevant, and that all desired audit objectives are particularized and fulfilled (Arens, Elder & Beasley, 2012: 147). Four phases of the audit is shown in Figure 5.

Figure 5. Phases of Financial Statement Audit



(Reorganized from [Arens, Elder & Beasley 2012, 147](#))

In fact audit firms have to decide whether to accept a new audit client, and also to keep auditing the current audit clients. Major phases of an audit according to [Messier, Glover & Prawitt](#) are (1) Client acceptance and/or continuance, (2) Preliminary engagement activities, (3) Plan the audit, (4) Consider and audit internal control, (5) Audit business processes and related accounts, (6) Complete the audit, and (7) Evaluate results and issue audit report (2017, 18-19).

The audit client's business, its strategies and processes, the environment of the entity are to be fully understood by the auditor. The countries the audit client has relations, its competitors and customers, economic environment of the entity, rules and regulations, financial conditions and opportunities, banking and insurance, human resources, energy, raw material, suppliers, and the like are to be assessed by the auditor. This approach will help to plan and design the audit. The next thing to do is identifying and evaluating internal controls and their effectiveness. In fact, each and every inquiry listed above is a slice of SCM in audit context. Following the assessment of control risk comes assessing the risk of material misstatement.

Risk Management and SCM

Boards, audit committees and executives are expected to implement risk management approaches encompassing the whole enterprise. Enterprise Risk Management (ERP) is a tool to manage the risks surrounding the entity. [Arens, et al. \(2012\)](#) say that an effectively implemented ERM process should provide auditors noteworthy information regarding the audit client's top significant business risk exposures.

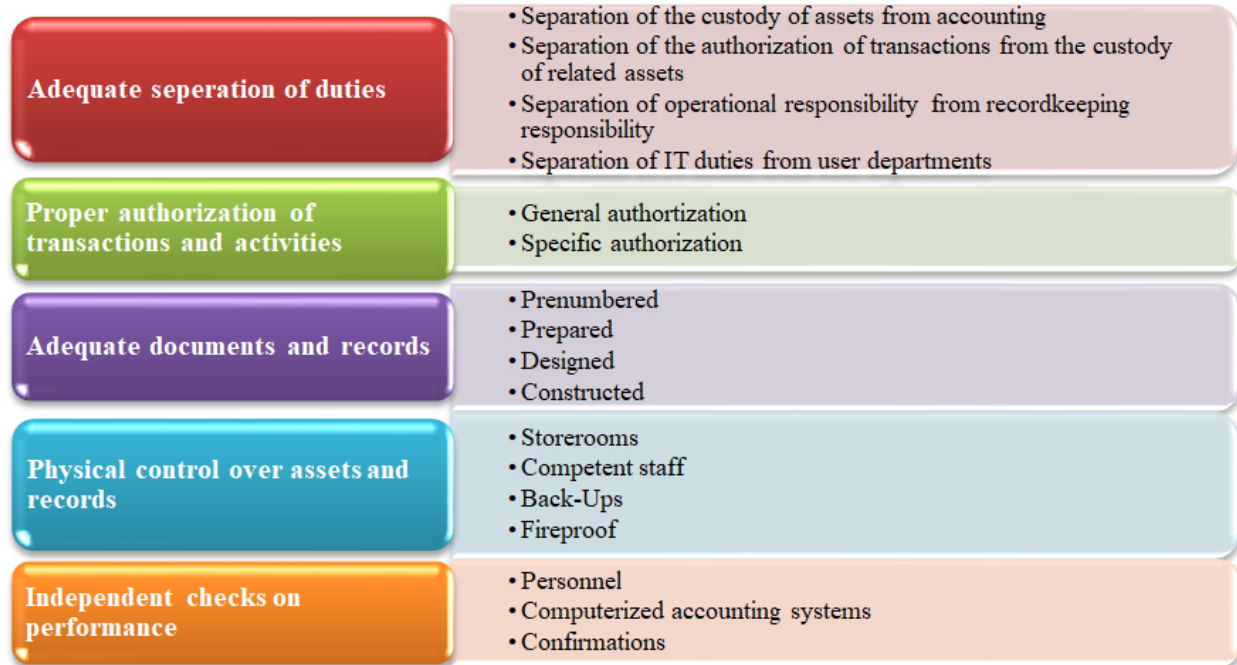
Industry ratios, financial ratios, similar prior-period data, audit client data about pre-determined expected results, audit determined expected results, non-financial data will all strengthen the auditor's position in risk assessment and provide insight into the entity's risk management. Risk management is mostly regarded as the internal audit function. However, in external audit, it is something related to e.g. testing all controls for the full sample or not ([Messier, Glover & Prawitt, 2017, 282](#)). The authors remind that both management and auditors should take care not to focus too much on the details of internal control that they miss more critical strategic and operational risk management issues as was the case during the banking crisis of 2007-2009 ([ibid, 715](#)). Entities' exposure to local and global market risks, changes in foreign currency rates and interest rates; usage of derivatives to manage financial exposures as a normal course of business, use of derivatives for trading or speculative purposes; documentation of these, recognition of derivatives designed as hedges to be recognized as assets/liabilities or forecasted transactions may all impose risks ([Warren, Reeve & Duchac, 2014: B-24](#)) that are to be managed. Control and/or audit of each should be considered as a slice of SCM.

Fraud risk management is another issue. The audit client's governance structure, periodic risk exposure assessment, prevention techniques, detection techniques, reporting process, investigation and corrective actions are each to be assessed by auditors. All processes and procedures mentioned here are also one slice of SCM each.

Control Activities in Auditing and SCM

There are inevitable risks to the accomplishment of the objectives of an entity. Policies and procedures addressing those are control activities. Risk assessment as mentioned above, information and communication, continuous monitoring along with control activities form the control environment. As [Arens](#) et al. (2012) mention five types of them are listed in Figure 6.

Figure 6. Types of Control Activities



(Organized from [Arens, Elder & Beasley p.255-256](#))

Control Activities according to [Messier](#), Glover & Prawitt are selection and development of (1) control activities contributing to the mitigation of risks to the achievement of objectives to acceptable levels, (2) general control activities over technology to support the achievement of objectives, and are deployment of the organization of (3) control activities that establish what is expected and procedures that put policies into action (2017, 282). Usage of SCM for control activities is adequate. Each type of control offers the opportunity to be interpreted as a slice of SCM.

4. CONCLUSIONS

Audit quality depends on its stakeholders. The public authority draws the frame; the audit clients demand audits; investors make decisions based on financial statements and external audit reports; audit firms benefit from this demand and supply auditing services; they employ auditors, and auditors perform the audit duty. At any point, at anywhere of the chain, there may perils occur. If any one of these parties assumes that all the other parties do their jobs properly, and if they neglect their own work based on this assumption, then an audit failure may happen. One little negligence can be absorbed by the system but in case all parties neglect something under this assumption, then comes the worst scenario and a big audit failure, causing huge losses, happens.

Securities exchange organizations monitor audit clients; public oversight—accounting and auditing standards authorities monitor auditors and audit firms. However, the risk appetite and ambition to make more money always put a threat on the audit quality. Public oversight bodies conduct continuing inspection programs in order to assess the audit firms' compliance levels; sanctions follow if necessary.

Audit firms have to target the minimization of failures originating from their own organizations; audit clients should aim preventing failures stemming from them; public oversight does not enjoy penalizing auditors and audit firms, and auditors do not like to be punished. All of these are hypotheses, unless the system finds everlasting solutions.

Under these circumstances, SCM helps to understand the necessity of precautions at every level of the audit process. In case one party faults, the other party will compensate. Even though the ideal situation is the one, where all parties function with due diligence, the natural holes and/or cavities are to be filled by each, in fact it is much better if there are no cavities at all.

The most vulnerable parties in audit process are the investors. Investors can be categorized as institutional investors and private investors. Institutional investors are equipped with various instruments and facilities. However, most of the private investors lack these instruments and facilities. They rely on the audit reports, which are monotonous and deliver limited information. They also rely on the public oversight. Of course, not all of the institutional investors are capable to make perfect analyses. Sometimes they fail. Then, these investors also rely on the oversight and audit mechanisms. This is why ???

Swiss Cheese Model Adopted to Audit Quality figure visualizes responsibilities and precautions of each party. If there happens a failure originated from any party, extra layers will serve as guards.

In order to add layers to the system, each party's deficiencies and neglects are to be exposed first. The ambition of investors to make more money is not unknown. This greed sometimes brings blindness. Spending time, money and effort to increase financial literacy is under the responsibility of the regulatory bodies. Yet, there will always be investors neglecting any kind of information, and act like gamblers. The target group of such kinds of efforts is not these gamblers. Once financial literacy problem is overcome, it turns to be the time to exercise effective oversight. The effectiveness of oversight depends on the independency of oversight bodies. There are samples of independent oversight and regulatory bodies, and there are also samples of countries, where these bodies are under the control of the politicians and government.

Sometimes it is witnessed that the audit firms become the other ambitious party. Despite the ban some audit firms provide bookkeeping service to their audit clients. By circumventing the ban, they sometimes do this by establishing shadow companies. The other weaknesses are mentioned under audit quality impacting factors.

In the light of this discussion, taking advantage of the SCM is a strategic move.

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