



<sup>1</sup>**Dr. Dalia Adel Abbass**  
Assistant Professor of Accounting

<sup>2</sup>**Dr. Tarek Abdelazeem  
Alrashedy**  
Assistant Professor of Accounting

Faculty of Commerce  
Damietta University

## The Effect of Comprehensive Income Volatility on Default Risk and Liquidity Risk in Egyptian Insurance Companies

### Abstract

We examine comprehensive income (CI) volatility incremental to net income (NI), and the relationship between CI volatility and two types of financial risks; default risk and liquidity risk in insurance companies in Egypt. Using data for the period 2010 – 2019 for a final sample of 33 companies which represents (84.6% of all insurance companies in Egypt) with 330 observations, results showed that CI is more volatile than NI and that more CI volatility is associated with more default risk and liquidity risk. Using Multiple linear regression, results show that foreign currency translation (FCT) is the main source of CI volatility in its association with default risk. Results also show that asset revaluation (AR) is the main source of CI volatility in its association with liquidity risk. Those results have implications for insurance companies to apply effective strategies to mitigate the volatility of FCT and AR, which has important implications for financial stability and policy formation for regulatory communities.

**KeyWords:** Comprehensive income volatility; Egyptian Insurance Companies; Default risk, Liquidity risk.

E. mail: <sup>1</sup>[daliaadel2000@du.edu.eg](mailto:daliaadel2000@du.edu.eg)

<sup>2</sup>[Trashedy40@yahoo.com](mailto:Trashedy40@yahoo.com)

## أثر تقلب الدخل الشامل على مخاطر عدم السداد ومخاطر السيولة في شركات التأمين المصرية

### ملخص البحث

استهدفت الدراسة فحص مدى التقلب في الدخل الشامل مقارنة بصافي الدخل، وفحص العلاقة بين تقلب الدخل الشامل ونوعين من أنواع المخاطر المالية وهما: مخاطر عدم القدرة على السداد ومخاطر السيولة في شركات التأمين في مصر. تمت الدراسة التطبيقية على عدد ٣٣ شركة تأمين مصرية في الفترة ٢٠١٠ - ٢٠١٩ إجمالي عدد مشاهدات ٣٣٠ مشاهدة (٣٣ شركة على مدار ١٠ سنوات) والتي تمثل حوالي ٨٥% من جميع شركات التأمين المصرية. وتشير نتائج الدراسة إلى أن الدخل الشامل أكثر تقلبا من صافي الدخل، ويرتبط بهذا التقلب مخاطر أعلى تتعلق بمخاطر عدم القدرة على السداد ومخاطر السيولة. وتشير النتائج باستخدام الانحدار الخطي المتعدد إلى أن ترجمة العملات الأجنبية يمثل المصدر الرئيسي في تقلب الدخل الشامل في علاقته بمخاطر عدم القدرة على السداد، بينما يمثل إعادة تقييم الأصول المصدر الرئيسي لتقلب الدخل في علاقته بمخاطر السيولة. ولهذه النتائج دلالات هامة لشركات التأمين في توجيه مجالس إدارتها بتطبيق استراتيجيات فعالة لخفض تقلب ترجمة العملات الأجنبية وإعادة تقييم الأصول لتحقيق الاستقرار المالي.

**الكلمات المفتاحية:** تقلب الدخل الشامل، شركات التأمين المصرية، مخاطر عدم السداد، مخاطر السيولة.

## 1. Introduction

Comprehensive Income (CI) is the focus of the International Accounting Standards Board (IASB) whether through the most recent IASB revised conceptual framework issued 2018 (CF2018), or through the new issued International Financial Reporting Standard (IFRS17). CF2018 adds a new chapter which includes concepts on presentation, disclosure, and guidance on including income and expenses in the statement of profit or loss and other comprehensive income for better communication of information that is relevant and which contributes to a faithful representation about an entity's assets, liabilities, equity, income and expenses. According to CF2018, the general principle is that all income and expenses are classified and included in the statement of profit or loss, and in exceptional circumstances, the IASB may decide to exclude from the statement of profit or loss income or expenses arising from a change in current value of an asset or liability and include those income and expenses in other comprehensive income (OCI) which are recycled to the statement of profit or loss in a future period. When doing so, results in the statement of profit or loss provide more relevant information or a more faithful representation (the two main primary characteristics of accounting information). Otherwise, OCI elements are not to be subsequently recycled (IASB, 2018). Moreover, the IASB issued the first truly International Financial Reporting Standard (IFRS17) for insurance contracts in May 2017 which replaced IFRS 4 "Insurance Contracts". IFRS 17 has an effective date of 1 January 2021 but companies can apply it earlier. IFRS 17 requires an insurance company to make an accounting policy choice of whether to recognize all insurance finance income or expenses in profit or loss or to recognize some of that income or expenses in other comprehensive income. Within the light of the recent regulatory changes provided by IASB regarding the to recycling of income and expenses items between the profit/Loss Statement and Comprehensive Income Statement through CF2018 and accounting policy judgments through IFRS 17 application, it is expected that the volatility of CI will be high from one period to another. The question of interest would be: which is more volatile, CI or NI? The increased volatility of comprehensive

income is an important issue because it implies a perception of increased risk (Khan & Bradbury 2016 & 2014). Managing risk is of great importance specially in the insurance sector.

Most previous studies empirically documented that CI is more volatile than NI (Bao, 2020; Barth et al., 1995; Hodder et al. 2006; Lee et al. 2006; Chambers et al. 2007; Bamber et al. 2010; Black& Cahan 2016; Khan & Bradbury 2016 & 2014; Lin et al., 2018). However, most of this literature is conducted in the nonfinancial sector companies. To the best knowledge of the authors, the current study is one of the early studies to be conducted in the insurance sector especially in Egypt as a developing country. So, this study complements and fills the gap in the literature by extending this line of research in a different sector, the insurance sector, and in a different setting, Egypt. However, results of the current study are important at the international level. Egypt is applying IFRS and hence, results of the study can be generalized to any country applying IFRS, whereas IFRS are applied worldwide. This is confirmed by (Black & Cahan, 2016) who reviewed the literature on the investor and contracting usefulness of comprehensive income, OCI, OCI components and Accumulated Other Comprehensive Income (AOCI). They concluded that because of the continuous divergence or convergence of accounting standards and regulatory requirements across borders for both banks and insurance companies, more opportunities arise for researchers to examine how companies make accounting choices related to OCI and AOCI and that insurance companies could be a particularly fruitful group of companies to be examined because of their unique business model, financial reporting, and regulatory environment. This can be discussed in detail as follows.

The business model of insurance companies is unique and differs from the business model of banks and nonfinancial companies. First, capital in financial companies is more sensitive to risks than in nonfinancial companies because financial companies are more leveraged and therefore need to be actively managed. Second, retained legal ownership of deposits by clients is a major difference between banks and insurance companies. So, default risk differs be-

tween banks and insurance companies. In addition, liquidity risk is higher for banks than for insurance companies because banks hold more illiquid assets versus liquid liabilities while insurance companies hold more liquid assets versus illiquid liabilities (De Weert, 2010).

Generally speaking, what banks and insurance companies do with customers is reflected at the liability side of their balance sheets where a substantial part of the customer base of a financial company has a creditor relationship. In addition, an insurance company has technical provisions as a balance sheet item, where a bank has deposits. This contrasts also with regular (non-financial) business models which are purely asset driven with customers that are typically debtors. For technical provisions held by insurance companies, they represent the best estimates of the net present values of future claims minus the net present values of future premiums. Deferred acquisition costs (DACs) unlocking may occur when DACs are not fully recovered because future premium flows were not as expected by the insurance company. This can cause liquidity problem for the insurance company (DeWeert, 2010). This implies that analysing the relationship between OCI incremental volatility from one side and liquidity risk and default risk from another side is unique and particularly different for insurance companies as what applies to any type (banking and nonfinancial) cannot be generalized to insurance sector companies. This is in addition to the fact that default risk and liquidity risk have more severe consequences for insurance companies.

The main objective of this study is to answer the question: What is the effect of CI volatility on both default risk and liquidity risk in Egyptian Insurance Companies? Answering this question is important as it helps in managing of such risks. The first step in risk management is determining the main source of CI volatility that has an influence on default risk and liquidity risk. Results show that there is a positive relationship between CI volatility and default risk and that foreign currency translation is the main source of volatility affecting default risk. Results also show that there is a positive association between CI volatility and liquidity risk and that the main source of CI volatility affecting

liquidity risk is asset revaluation. These results have important implications for insurance companies as they have to manage these sources of volatility to manage default risk and liquidity risk.

## **2. Nature of the Problem**

Three main categories of risks face insurance companies. They include insurance risks, financial risks, and operational risks (IASB, 2017; Duverne & Hele, 2016). This study concentrates on the analyzing the effect of incremental CI volatility on two types of financial risks; the default risk and the liquidity risk in Egyptian Insurance companies. To the best knowledge of the researchers, no other studies in Egypt examined this relationship. This study is complementary to the empirical studies on the value effect of comprehensive income presentation and disclosure on the reduction of a firm's default risk and liquidity risk (Bao et al., 2020; Khan & Bradbury, 2016). It extends this line of research by examining this relationship in a unique set of companies, insurance companies in Egypt. Higher incremental CI volatility is usually associated with a higher probability of default and bankruptcy, a greater likelihood of downgrades in credit rating, and a higher cost of debt. This means that analyzing OCI volatility provides useful information to credit markets and influences various aspects of debt contracting (Bao et al., 2020).

The business of insurance companies is to accept customers risks; the total amount of risk they absorb from customers, before considering the impact of their risk management practices, is much less significant than the residual risk that remains after the company has taken steps to manage and mitigate risk. Financial risks (default risk, liquidity risk, and market risk) are the dominant risks especially for life insurance companies as they represent 60% of total risk (Duverne & Hele , 2016). Comprehensive income is not only important for managing default and liquidity risks in insurance companies, but it also assists investors in assessing the risk associated with unrealized gains and losses on available for sale (AFS) securities, and this information helps investors assessing firm risk when it is presented in a performance statement (Black & Cahan, 2016). As Bao et al., (2020) stated, OCI information helps investors to assess

firm credit risk and it is also used by credit rating practitioners, such as Standard and Poor's (S&P) in their credit-rating methodology (S&P 2007; 2008; 2017) which includes OCI-included items related to derivatives, fair value changes, and foreign-currency exchange gains and losses. The incorporation of OCI-related items in S&P's methodology (2008) is tied to S&P's explicit statements about the need to distinguish actual cash flow from earnings, given that cash is required to pay creditors: "An enterprise's capacity to pay debts or any other obligation, the core underlying concept of a credit rating, default risk, and liquidity risk, is determined by the ability to generate cash—not earnings, which is an accounting concept" (Bao et al., 2020, p.2). This process includes using reported OCI related information to better forecast future cash flow generation and variability. Other potential sources of earnings and cash flow volatility are exposure to foreign exchange or commodity price movements. The use of derivatives to manage such exposure is viewed as part of our overall financial risk assessment, but the choices made by management are also reflected on its risk appetite. This shows clearly the relationship between OCI and its components volatility from one side and liquidity and default risk from another side. In particular, insurance companies could be a fruitful group of companies to examine because of their unique business model, financial reporting, and regulatory environment that is evolving in different parts of the world. In Egypt, the legal framework of Egypt's insurance sector comprises of a raft of legislation, rules, and decisions that enable Financial Regulatory Authority (FRA) to play its role effectively to protect investors and regulate the market. Moreover, it also contributes to consistently developing the Authority's supervisory framework. The sector's legal framework includes: Law no.10 of 1981 Promulgating Insurance Supervision and Control in Egypt, its Executive Regulation and amendments pursuant to Law no. 118 of 2008, Law no. 54 of 1975 Promulgating the Private Insurance Funds and its executive regulations, and Law no. 72 of 2007 promulgating the Law on Compulsory Insurance against the civil liability arising from high speed transportation motor vehicle and its executive regulations. The legal framework of the insurance market consists of several legislation, including:

Companies Law no. 159 of 1981 and its Executive Regulation, Anti-money laundering Law, Taxes Law, the Unified Building Law, and the Elevators Law.

The remainder of this paper proceeds as follows: section three introduces the insurance sector in Egypt; section four discusses Literature Review and Hypotheses Development, section five discusses the empirical study, section six discusses results and section seven includes conclusion.

### **3-Insurance Sector in Egypt**

Insurance is one of the most important non-banking financial activities in Egypt. Insurance is deemed as one of the major instruments for the stability and continuity of the other non-banking financial sectors. The Financial Regulatory Authority (FRA) has been keen on boosting the insurance sector's role and maximizing its contribution to gross domestic product (GDP) by streamlining its legislative framework. Continuous updates are taking place including rules set for specifying depreciation rates for Motor insurance, rules set for regulating the license of Takaful insurance companies to practice its work pursuant to commercial insurance system in the Egyptian insurance market, registry the establishment of a mandatory motor third party liability pool, regulating the work of grievances' committees pursuant to the provisions of laws under FRA's supervision (insurance, capital market, mortgage finance, micro-finance, financial leasing, factoring).

The insurance sector's contribution to GDP reached 0.9% in 2019. As part of FRA's efforts to encourage insurance sector to embrace digital transformation in issuing and distributing insurance policies that do not need complex steps for subscription, 60% of the insurance companies operating in Egypt were licensed by FRA to issue e-insurance policies. In 2019, insurance premiums grew by 19%, while the number of companies operating in Egypt's insurance sector reached 39 companies. Total premiums amounted to EGP 35.2 billion by the end of June 2019. On the other hand, companies paid total claims worth EGP 18.3 billion in 2019. Despite the surplus of insurance companies declined by 29.3% to EGP 4.7 billion in 2019, results of companies'



activities improved over the past four years. In 2019, insurance surplus amounted to EGP 4.7 billion, which in turn attracted new investments in the insurance market through establishing new companies. Shareholders' equity in insurance companies amounted to EGP 35 billion in 2018 with a decreasing rate of 7.8% compared to EGP 38 billion in 2018. These figures show how the insurance sector is developing over time and how important is this sector to the whole economy. Managing the most dominant financial risks facing insurance companies is crucial for the stability of the whole economy. Insurance companies in Egypt are required to apply IFRS.

#### **4- Literature Review and Hypotheses Development**

As accounting standards and regulatory requirements change, more opportunities arise. Since the Egyptian Minister of Investment imposed the application of the Egyptian Accounting Standards (EAS) to be in line with 2014 International Financial Reporting Standards (IFRSs) version by the decision No.110/205 which was issued on 9<sup>th</sup> of July, 2015, for all Egyptian Listed Companies, a stream of research was conducted to examine the usefulness of presenting a separate comprehensive income statement according to International Accounting Standard (IAS) "Presentation of Financial Statements", and the incremental value from reporting comprehensive income compared to net income as a performance measure, comparing the characteristics of the two performance measures including persistence, timeliness, volatility, and their predictive ability of firm value, stock return, earnings per share, cash dividends, and cash flows (Abdelwahab, 2017; Youness, 2019; Alhowshi, 2018; Khamis, 2018; Mansour, 2018; Ali, 2019). This is similar to the stream of research done outside Egypt in the west (Hodder et al. 2006; Lee et al. 2006; Chambers et al. 2007; Bamber et al. 2010; Black and Cahan 2016; Khan & Bradbury., 2016; Lin et al., 2018). This paper complements this line of research from a different perspective; the risk perspective to complement the usefulness CI and CI components and from a risk management perspective. No previous study in Egypt to the best knowledge of the researchers exam-

ined the CI usefulness in the insurance sector as all of the previous studies are performed in the nonfinancial sectors and the banking sector.

Moreover, the two streams of research inside and outside Egypt focused on the investor side. An emerging stream of research outside Egypt started analysing the effects of CI volatility, incremental other comprehensive income (OCI) volatility, and OCI components volatility on the creditor. Despite the fact that both banks and insurance companies engage in securities and derivatives transactions, the regulatory environment surrounding insurance companies is evolving in different ways and at different speeds in different parts of the world (Black & Cahan, 2016). This is clear from the regulatory requirements and changes by the IASB (IASB2018; IFRS17) at the international level. At the national level, in Egypt, many changes are taking place. A new unified insurance law is submitted July 2019 to Cabinet, whereas two ministerial decrees were issued in 2018; decree No.(2734) regarding the issuance of the statute regulation of Policyholders Guarantee Fund and decree No.(2291) regarding the issuance of the statute regulation of governmental fund to cover damages resulting from accidents of rapid transit vehicles. In addition, the chairman of the Financial Regulatory Authority (FRA) is continuously changing many rules over time. In 2019 only, nine decisions are issued as outlined in section two of this paper. This is in addition to digital transformation in issuing and distributing standard insurance policies.

Bao et al., (2020) examined the usefulness of other comprehensive income (OCI) to debt investors for a sample of 2,875 nonfinancial companies for the period 2004 to 2014. A measure of incremental OCI volatility, designed to capture the effect of OCI on overall firm asset volatility was constructed which is a primary driver of credit risk in Merton's (1974) model. Results of the study show that incremental OCI volatility influence the likelihood of default<sup>1</sup> which has implications for creditors' use of information from OCI in

---

<sup>1</sup> Bao et al., (2020) mentioned that the value of a firm's debt depends on its credit risk, which, in turn, depends on the probability of default. So, credit risk and default risk are used interchangeably.

their assessment of firm credit risk and in pricing debt contracts because of the increase in the cost of debt (interest rate). In the same line of research, (Khan & Bradbury, 2016 ) examined the volatility and risk relevance of CI, relative to net income, for a sample of 92 New Zealand nonfinancial firms for the period 2003– 2010. We extend this line of research to incorporate the CI volatility incremental to net income and its risk relevance usefulness for two important financial risks faced by insurance companies which are default risk and liquidity risk. Numerous studies found a positive relationship between earnings as a measure of firm asset volatility and measures of credit risk and hence default risk. In the same line of research, our study contributes to the literature by providing empirical evidence that CI volatility impacts stakeholders' perceptions of firm default risk and liquidity risk.

#### **4.1 Comprehensive Income Volatility and Net Income Volatility**

In Egypt, empirical studies analyzing the effects of presenting a separate comprehensive income statement– after first time application of IFRS in 2015– and the CI usefulness compared to NI document contradictory results. While some studies found no additional information content, no effect on market value, no effect of the presentation of comprehensive income on a separate statement (Ali, 2019), and no effect on predicting earnings per share and cash flows (Abdelwahab, 2017). Other studies show significant positive relationships between presenting separate comprehensive income statement and information content of comprehensive income reflected on stock price (Youness, 2019), dividends (Alhowshi, 2018), predictive value of stock return, and operating cash flows (Khamis, 2018). While other studies found negative effect on predictability of stock price (Mansour, 2018), profits and cash flows compared to net income (Alhowshi, 2018)<sup>2</sup>. This study comple-

---

<sup>2</sup> Literature is reviewed using the Egyptian Knowledge Bank database which is s the world's largest digital library granting unlimited resources exclusively for Egyptians and so the most widely used database for all researchers in Egypt. It has subscriptions with all recognized publishers worldwide including Wiley, Elsevier, American Accounting Association and others. This is in addition to all the Arabic sources including Egyptian Universities Journals, Dar Al Mandumah: EcoLink, Dissertations, AraBase, Emerald Insight.

ments this line of research by analyzing the CI information content from a risk perspective in the insurance sector. Most previous literature in Egypt (Abdelwahab, 2017; Youness, 2019; Alhawshi, 2018; Khamis, 2018; Mansour, 2018) and outside Egypt; (Bao, 2020; Barth et al., 1995; Hodder et al. 2006; Bamber et al. 2010; Khan & Bradbury, 2014; Lee et al. 2006; Chambers et al. 2007; Black & Cahan 2016; Khan & Bradbury, 2016) documented that the CI is more volatile than NI. In the insurance sector, it is expected that the OCI components are higher in value than in nonfinancial companies where most previous studies are implemented. This is in addition to the recent changes made by the IASB (CF2018 and IFRS17) as mentioned previously. This means that it is expected that CI volatility is expected to be higher than NI volatility for insurance companies in Egypt and this volatility is expected to be significantly higher than the nonfinancial companies CI volatility. This leads to developing the first research hypothesis:

**Hypothesis 1: Comprehensive income is more volatile than net income in Egyptian Insurance Companies.**

Variation in OCI adjustments related to Available for Sale Securities (AFS), pensions, and foreign currency translation drive most of the variation in OCI and it is greatly affected by market volatility of the recent global financial crisis (Black & Cahan, 2016). Khan & Bradbury (2016) documented that in New Zealand, asset revaluations are the most dominant source of OCI volatility. In Egypt, it is expected that Foreign Currency Translations (FCT) Gains and Losses to be an important OCI component driving most of the change in OCI as Egypt allows the currency (Egyptian Pound) to float freely since November 2016 which reduced its value by almost 50% against the dollar. Results confirm this result when analyzing the association between CI volatility and default risk. However, results show that the main source of volatility affecting the liquidity risk is asset revaluation.

## **4.2 Default Risk and Comprehensive Income**

Incremental OCI volatility increases the probability of default and so provides useful information to debt holders (Bao et al., 2020; Jung et al. 2013). A firm's default risk is a forward-looking measure of the firm's own probability of default or the current and future risk facing its creditors. Default risk is also the risk of losses due to the failure of counterparty. As insurers invest premiums in bonds and debt products to meet future obligations to policyholders, therefore they are naturally exposed to default risk. All types of insurance products give rise to elements of default risk, but more asset-intensive products are larger sources of default risk. Default risk can also arise from sources other than investments. For example, insurers can be exposed to default risk from their interaction with other financial intermediaries such as reinsurers, derivative counterparties and banks. Insurance companies use many practices to manage default risk. Fundamental credit analysis of investment opportunities are essential and are supplemented by third party credit rating agencies. Insurers ensure diversification of counterparty risks by establishing investment guidelines for their portfolios, including limits such as restrictions by asset class, credit quality, and issuer. (Duverne & Hele, 2016). This study helps insurance companies by determining the CI components that have greater variability and therefore they are the main sources of risks in addition to the previous tools.

Credit ratings, leverage, interest coverage ratio, liquidity ratio, and size are commonly used as proxies for default risk. Bao et al., (2020) mentioned that Merton (1974) option pricing framework models the value of debt as a function of the probability of default. This is in addition to the qualitative aspects of the firm such as corporate governance mechanisms which are important predictors of default risk which is unfortunately often ignored. In this research, quantitative aspects, volatility of income measures, are analyzed as opposed to qualitative ones. Decreasing the probability of default is associated with decreasing the volatility of cash flows, thereby reducing expected costs of financial distress (Lundqvist & Vilhelmsson, 2018; Khan & Bradbury, 2016).

From the previous discussion, it is argued that more CI volatility is associated with increasing the volatility of cash flows and so increasing the probability of default (default risk). Taking into consideration the previous hypothesis that CI volatility is more volatile than NI, this leads to developing the following research hypotheses:

**Hypothesis 2: There is a positive relationship between CI volatility and default risk.**

### **4.3 Liquidity Risk and Comprehensive Income**

Liquidity risk is the risk that an insurer has inadequate cash to meet obligations as they become due. Liquidity risk varies by product type. Many products are completely illiquid, where the policyholder has no ability to surrender or terminate the contract, and any payments to a policyholder are made only on fixed schedules or upon the occurrence of specified events, while some products includes more liquidity risk through providing customers with more access to funds. Another aspect of liquidity risk is financing risk, which is the uncertainty of the ability to obtain sufficient funding in due time and on favorable terms (Duverne & Hele, 2016). Liquidity risk is managed using a combination of product features and investment management strategies. Unlike banking, maturity transformation is not a significant element of the insurance business model. In many cases an insurer's promise to its policyholder may be for a very long duration and illiquid, unlike the 'on demand' nature of bank deposits. In some markets, it is also common for insurance products to have contract features allowing the insurer to delay payment of cash value for some period of time (for example, six months). These features provide substantial protection in stressed market conditions.

The importance of liquidity risk is confirmed in IFRS17. It is stipulated in IFRS17 that entity shall disclose liquidity risk arising from contracts within the scope of IFRS 17, including: (a) a description of how it manages liquidity risk, (b) separate maturity analyses for groups of insurance contracts issued that are liabilities and groups of reinsurance contracts held that are liabilities that show as a minimum, net cash flows of the groups for each of the first five

years after the reporting date and in aggregate beyond the first five years. The analyses may take the form of: (i) an analysis, by estimated timing, of the remaining contractual undiscounted net cash flows; or (ii) an analysis, by estimated timing, of the estimates of the present value of the future cash flows. (c) the amounts that are payable on demand, explaining the relationship between such amounts and the carrying amount of the related groups of contracts, if not disclosed applying (b) of this paragraph.

The operating cash flow to current liabilities ratio is used as a proxy for liquidity risk (Khan & Bradbury, 2016). Liquidity risk can be measured by a liquidity indicator—the difference between liquidity resources and net outflows under stress. The stressed conditions are calibrated so as to reflect extreme circumstances and they include: distressed financial markets in terms of asset prices, liquidity and access to funding through capital markets; and confidence crises in the case of increase in lapses, decrease of premiums received, and no new business (Duverne & Hele, 2016). Higher interest rates reduce the value of financial guarantees and thus provide an incentive to cancel, i.e., lapse, products with financial guarantees. Lapses raise liquidity risk and may result in high selling pressure.

One of the major arguments against requiring firms to report comprehensive income in a statement of performance is that OCI and therefore comprehensive income is more volatile than net income and would increase investors' assessments of firm risk (Black & Cahan, 2016). Taking into consideration the first hypothesis that comprehensive income is more volatile than the net income, this leads to developing the following third research hypotheses:

**Hypothesis 3: There is a positive relationship between CI volatility and liquidity risk.**

## 5. Empirical Study

### 5.1 Data Collection and Sample Construction

Data are collected from the annual statistical reports issued by (*FRA*)<sup>3</sup>, Mubasher Misr<sup>4</sup>, annual reports published on Egyptian Stock Exchange website, and Egyptian Insurance Companies websites. Data about net income, other comprehensive income and its components, and company specifics are hand collected from the annual reports of insurance companies and annual statistical reports issued by *FRA*.

The population consists of 39 Egyptian insurance companies for the period 2010 to 2019. The Minister of Investment imposed the application of the Egyptian Accounting Standard (*EAS*) to be in line with 2014 International Financial Reporting Standards (*IFRSs*) version by the decision No.110/205 which was issued on 9<sup>th</sup>, July 2015, and which was again amended by the Minister of Investment Decree No. 69 of 2019. Before 2015, no separate comprehensive income statement was required to be prepared and other comprehensive income components were to be presented in the Statement of Changes in Equity. So, comprehensive income data is collected from the changes in equity section for the period from 2010–2015 and from the Comprehensive Income Statement for the period from 2016 to 2019. The final sample consists of 33 companies (84.6% of all insurance companies in Egypt) for 10 years with a total number of observations 330 observations. The sample construction after excluding companies with incomplete data is provided in Table (1).

---

<sup>3</sup>FRA frequently issues an annual statistical report of Egyptian Insurance Market both in Arabic and in English. which includes all data and information related to the insurance sector in Egypt. It includes quantitative and qualitative data related to every company in the insurance sector and all the indicators of the different companies in the sector (financial performance, risk, market share, growth, ..etc) in an aggregate very organized way. All reports are available at:

[http://www.fra.gov.eg/content/efsa\\_en/eisa\\_pages\\_en/report\\_eisa\\_en.htm](http://www.fra.gov.eg/content/efsa_en/eisa_pages_en/report_eisa_en.htm)

<sup>4</sup> Muabsher is a website that covers financial and stock markets & provides latest prices & values for local and global exchanges including Egypt “Mubasher Misr”.



**Table 1: Sample Selection**

Total Number of Insurance Companies in Egypt	39
Exclude: Companies with Incomplete Data	(6)
Final Sample Number	33 (33*10 years) = (330 observations)

## 5.2 Research Design and Variables

To maintain comparability with prior research, and following (Khan & Bradbury, 2016) who adopted the research design followed by (Hodder & Wahlen, 2006) and (Khan and Bradbury, 2014), this study follows the same approach as follows.

### 5.2.1 The independent & Dependent variables

The main variable of interest which is the comprehensive income volatility ( $CI\_VOLit$ ) which is measured as the standard deviation of comprehensive income during the prior five years ( $\sigma CIit$ ) (Bao et al., 2020). We regress default risk on all comprehensive income components ( $NI$ ,  $FCT$ ,  $AFS$ ,  $AR$ ) variability and we also regress liquidity risk on all comprehensive income components variability. Variability is measured by the standard deviation of the specific  $CI$  component during the prior five years. Dependent variables are previously explained in detail in section 4.3 and 4.4.

### 5.2.2. Control Variables

Previous studies documented the variables that affected default risk and liquidity risk. Those variables include differences among insurance companies in profitability measured by return on assets, insurance companies' characteristics measured by *size* (Lundqvist & Vilhelmsson, 2018). Also, a firm's risk of defaulting on its debt requiring debt restructuring is expected to increase with the amount of its leverage as well as with the degree of its earnings and returns volatility and decrease with its size, tangibility, profitability, liquidity (proxied by interest coverage and current ratio), and bond maturity (Chen et al., 2019). Bao et al., (2020) argued that the equity of a firm (its asset value less debt) defences against default, so less leverage (more equity) implies a lower probabilit-

ity of default. Following previous literature, in this study, size, return on assets, current ratio, cash flow variability, total amount of debt are used as control variables. Consistent with literature, it is expected that the relationship between default risk and (size, return on assets, and current ratio) is negative, while the relationship between default risk and (*CI* volatility and total debt) is positive.

Table (2) summarizes the variables (independent, dependent, and control), their measurement and the model used for to test every research hypothesis.

**Table 2: Empirical Model, Variables, and Measurement**

Variable	Measurement
Testing the first research Hypothesis (H1): CI is more volatile than NI. (By Comparing (CI_VOLit) using ( $\sigma_{CIit}$ ) and (NI_VOLit) using ( $\sigma_{NIit}$ ).	
Comprehensive Income (CI)	Total Comprehensive income (net income plus other comprehensive income) scaled by market value of opening equity for company <i>i</i> for period <i>t</i> . (following Khan & Bradbury, 2016).
Comprehensive Income Volatility (CI_VOLit)	The standard deviation of comprehensive income scaled by market value of opening equity ( $\sigma_{CIit}$ ) for company <i>i</i> at period <i>t</i> for the period (2010–2019). (following Khan & Bradbury, 2016).
Net Income (NIit)	The amount of income before extraordinary items scaled by market value of opening equity ( $\sigma_{NIit}$ ) for company <i>i</i> for period <i>t</i> for the period (2010–2019). (following Khan & Bradbury, 2016).
Net Income Volatility (NI_VOLit)	The standard deviation of net income scaled by market value of opening equity ( $\sigma_{NIit}$ ) for company <i>i</i> for period <i>t</i> for the period (2010–2019). (following Khan & Bradbury, 2016).

Other Comprehensive Income (OCI <sub>it</sub> )	The amount of other comprehensive income scaled by market value of opening equity ( $\sigma\text{OCI}_{it}$ ) for company <i>i</i> for period <i>t</i> for the period (2010–2019). (following Khan & Bradbury, 2016).
Other Comprehensive Income Volatility (OCI_VOL <sub>it</sub> )	The standard deviation of other comprehensive income scaled by market value of opening equity ( $\sigma\text{OCI}_{it}$ ) for company <i>i</i> for period <i>t</i> for the period (2010–2019). (following Khan & Bradbury, 2016).
Foreign Currency Translation Gains and Losses (FCT <sub>it</sub> )	The amount of FCT scaled by market value of opening equity for company <i>i</i> at period <i>t</i> for the period (2010–2019). (following Khan & Bradbury, 2016).
Asset Revaluation Gains and Losses (AR <sub>it</sub> )	The amount of AR scaled by market value of opening equity for company <i>i</i> at period <i>t</i> for the period (2010–2019). (following Khan & Bradbury, 2016).
Available for sale investments gains and losses (AFSI <sub>it</sub> )	The amount of AFSI scaled by market value of opening equity for company <i>i</i> at period <i>t</i> for the period (2010–2019). (following Khan & Bradbury, 2016).
<b>Testing the second research hypothesis:</b>	
The model: $\text{Def\_RISK} = \alpha_0 + \alpha_1 \text{CI\_VOL}_{it} + \alpha_2 \text{CONT}(\alpha_3 \text{LOG\_CL} + \alpha_3 \text{CASH\_FLOWS\_VOL}_{it} + \alpha_4 \text{LOG\_SIZE}_{it} + \text{LOG\_TOT\_DEBT} \alpha_4 + \text{ROA}_i) + \varepsilon_{it}$	
Default Risk (DEF_RISK <sub>it</sub> )	Debt to equity for company <i>i</i> at period <i>t</i> for the period from (2010–2019). Following Khan et al., (2016); Beaver et al. (1970); (Bowman (1979).
<b>Testing the third research hypothesis:</b>	
The model: $\text{LIQ\_RISK} = \alpha_0 + \alpha_1 \text{CI\_VOL}_{it} + \alpha_2 \text{CONT}(\alpha_3 \text{LOG\_CL} + \alpha_3 \text{CASH\_FLOWS\_VOL}_{it} + \alpha_4 \text{LOG\_SIZE}_{it} + \text{LOG\_TOT\_DEBT} \alpha_4 + \text{ROA}_i) + \varepsilon_{it}$	
Liquidity Risk (LIQ_RISK <sub>it</sub> )	Operating cash flow to current liability for company <i>i</i> at period <i>t</i> for the period from (2010–2019), following Khan et al., (2016); Beaver et al. (1970).

Operating Cash Flows Volatility (CASH_FLOWS_VOLit)	The standard deviation of operating cash flows from the cash flow statement for company <i>i</i> at period <i>t</i> for the period from (2010–2019).
Total Assets (LOG_SIZEit)	The natural logarithm of market value of assets, which is calculated as the sum of market value of equity and book value of liabilities as of the fiscal year end for company <i>i</i> at period <i>t</i> for the period from (2010–2019).
Total Debt (LOG_TOT_DEBT)	The natural logarithm of total liabilities from the cash flow statement for company <i>i</i> at period <i>t</i> for the period from (2010–2019).
Current Ratio (CR)	The amount of current assets divided by the amount of current liabilities
Return on Assets (ROA)	Income before extraordinary items divided by total assets at year <i>t</i> .

The following details our estimation of various regression specifications of the following form for the purpose of testing the impact of incremental *CI* volatility (*CI\_VOL*) on default risk and liquidity risk.

## 6. Results

### 6.1 Descriptive Statistics

Panel (A) of the table (3) shows the descriptive statistics of the different *CI* components for the pooled sample for the ten years (All components are scaled by market value of opening equity, following (Khan & Bradbury, 2016). While panel (B) provides the annual means and standard deviations statistics for every year from 2010 to 2019.

From Panel (A), the *CI* mean is 0.51 while its standard deviation is 0.489. The *NI* mean is 0.204 while its standard deviation is 0.172. This means that *CI* has a higher standard deviation than *NI*. The standard deviation of *CI* is higher than the standard deviation of *NI* tends to support the first hypothesis that the volatility of *CI* is higher than the volatility of *NI* as shown down. To determine the source of *OCI* volatility that is responsible for the *CI* volatility

during the period 2010–2010, we compare the mean and standard deviation for every *OCI* element and we find that foreign currency translation (*FCT*) has the highest mean and the highest standard deviation which has a mean of 0.14 and standard deviation of 0.197 compared to a mean of 0.073 and a standard deviation of 0.143 for available for sale securities (*AFSI*) and a mean of 0.097 and a standard deviation of 0.316 for asset revaluation (*AR*).

Panel B shows the annual means and standard deviations of the main variables of interest including comprehensive income volatility for the period from 2010 – 2019. These descriptives confirm that *FCT* is the highest for every year whether in terms of the annual mean or the annual standard deviation. This has implications for insurance companies to apply effective strategies to mitigate the volatility of *FCT*. (Edwards & Rigobon, 2009) which confirmed the importance of applying effective risk management techniques by financial institutions especially in emerging economies as exchange rate exposures have important implications on financial stability and policy formation for regulatory communities.

**Table 3: Descriptive Statistics**

**Descriptive statistics of firm specific measures of income volatility  
Panel (A): Pooled Sample**

	Minimum	Maximum	Mean	Standard Deviation
NI	-0.598	0.530	0.204	0.172
CI	-1.070	2.159	0.51	0.489
OCI	-0.472	1.706	0.305	0.409
AFSI	-0.003	0.749	.0729	0.143
FCT	-0.441	0.619	0.135	0.196
AR	-0.031	1.623	0.097	0.315

**Panel B: Annual Means**

Annual Means Descriptive Statistics <sup>a</sup>										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
NI	0.185	0.204	0.199	0.177	0.208	0.215	0.214	0.227	0.208	0.206
CI	0.493	0.550	0.561	0.559	0.472	0.496	0.521	0.485	0.532	0.502
OCI	0.307	0.345	0.360	0.294	0.287	0.305	0.271	0.305	0.294	0.284
AFSI	0.074	0.074	0.081	0.077	0.069	0.069	0.061	0.075	0.078	0.067
FCT	0.148	0.135	0.141	0.140	0.139	0.154	0.125	0.125	0.112	0.132
AR	0.084	0.135	0.136	0.077	0.078	0.081	0.085	0.104	0.104	0.084

**Panel B: Annual Standard Deviations**

Statistics <sup>a</sup>										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
NI	0.197	0.187	0.187	0.194	0.139	0.151	0.139	0.143	0.195	0.195
CI	0.527	0.561	0.559	0.476	0.388	0.388	0.4011	0.388	0.507	0.568
OCI	0.432	0.474	0.472	0.375	0.346	0.347	0.3380	0.440	0.4616	0.425
AFSI	0.149	0.149	0.154	0.134	0.1265	0.127	0.122	0.1666	0.1701	0.146
FCT	0.209	0.204	0.180	0.171	0.1862	0.176	0.212	0.211	0.1701	0.146
AR	0.319	0.396	0.395	0.268	0.2675	0.267	0.268	0.330	0.3307	0.319

**6.2 Results of Testing Hypothesis 1: CI is more volatile than NI**

More analysis is performed for the income volatility ratios in table (4). Panel A shows descriptive Statistics of firm specific measures of income volatility (standard deviation during the prior five years), Panel B shows descriptive statistics of income volatility ratios, and panel C shows the distribution and statistical comparisons of income volatility ratios. Panel D shows the results of the *Wilcoxon signed-rank* test to test for the difference in medians between *CI* components volatility and *NI* volatility.

More specifically, from Panel B, the mean standard deviation ratio of *CI* to *NI* ( $\sigma CI/\sigma NI$ ) is 6.3102 indicating that *CI* is about 630 percent more volatile than *NI*. So, *the first research hypothesis is accepted* that *CI* is more volatile than *NI*. Also, the median standard deviation ratio of *CI* to *NI* ( $\sigma CI/\sigma NI$ )

is 2.616 which supports our conclusion. For the other *CI* components, the mean (median) standard deviation of foreign currency translation gains and losses (*FCT*), available for sale investments gains and losses (*AFSI*) and asset revaluations gains and losses (*AR*) are calculated and the ratios of the standard deviation of every component to the standard deviation of *NI* is calculated and reported in table (4) Panel B. Arranged in a descending order to rank the *CI* components responsible for the *CI* variability, We find that the mean (median)  $\sigma FCT/\sigma NI$  is 4.21 (1.05), the mean (median)  $\sigma AFSI/\sigma NI$  2.14(0.53), the mean (median)  $\sigma AR/\sigma NI$  is 1.27 (0.24).

Panel (c) which shows the distribution and statistical comparisons of income volatility ratios shows that volatility of comprehensive income incremental to net income ( $\sigma CI/\sigma NI$ ) is greater than one ( $>1$ ) for 76% of the insurance companies in Egypt and less than one for the remaining 24%. Again, the highest percentage of companies having volatility in *OCI* components is for the *FCT* component as ( $\sigma FCT/\sigma NI$ ) is greater than one ( $>1$ ) for 64% of the insurance companies in Egypt and less than one for the remaining 36%. This confirms that the majority of insurance companies in Egypt suffer from *FCT* volatility more than any other *CI* component.

*Wilcoxon signed-rank test* is performed and (Panel D) shows the results. As results show, *CI* volatility incremental to *NI* is significantly higher than *NI* volatility (at the 0.05 level). This result rejects the null hypothesis of no difference in the volatility of *CI* and *NI* and supports the alternative hypothesis that the *OCI* components make *CI* more volatile than *NI*. Furthermore, this result persists when the test is performed for *OCI* only. However, for the *OCI* components (*AFSI*, *AR*, and *FCT*), the null hypothesis which states no difference in the volatility of *NI* and every *OCI* component is accepted as shown in Panel D of table (4)

**Table 4: Comparative analyses of comprehensive income components volatility****Panel A: Descriptive Statistics of firm specific measures of income volatility**

	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
$\sigma$ NI	.0004	0.376	0.0678	0.0879
$\sigma$ CI	.0004	1.174	0.2027	0.2723
$\sigma$ OCI	.0000	.8984	0.1629	0.2063
$\sigma$ AFSI	.0000	0.3597	.0394	0.0743
$\sigma$ FCT	.0000	0.2541	0.0851	0.0835
$\sigma$ AR	.0000	0.7915	0.0835	0.1841

**Panel B: Descriptive Statistics of income volatility ratios**

	$\sigma$ CI/ $\sigma$ NI	$\sigma$ AR/ $\sigma$ NI	$\sigma$ FCT/ $\sigma$ NI	$\sigma$ AFSI/ $\sigma$ NI	$\sigma$ OCI/ $\sigma$ NI
Mean	6.3102	1.27	4.2097	2.1441	6.1658
Median	2.616	0.237	1.055	0.527	2.612
Std. Deviation	11.328	1.862	9.6763	5.089	11.637
Range	59.365	7.746	52.2268	26.24	60.56
Minimum	0.297	.0000	.0000	.000	.05
Maximum	59.662	7.7457	52.2268	26.25	60.61



**Panel C: Distribution and statistical comparisons of income volatility ratios**

Comparisons	Count	%
$\sigma_{CI}/\sigma_{NI} > 1$	25	76%
$\sigma_{CI}/\sigma_{NI} < 1$	8	24%
$\sigma_{AR}/\sigma_{NI} > 1$	11	33%
$\sigma_{AR}/\sigma_{NI} < 1$	22	67%
$\sigma_{FCT}/\sigma_{NI} > 1$	15	45%
$\sigma_{FCT}/\sigma_{NI} < 1$	18	55%
$\sigma_{AR}/\sigma_{NI} > 1$	11	33%
$\sigma_{OCI}/\sigma_{NI} > 1$	22	67%
$\sigma_{OCI}/\sigma_{NI} > 1$	21	64%
$\sigma_{OCI}/\sigma_{NI} > 1$	12	36%

**Panel D: Wilcoxon's signed-rank test (p-values)**

**The following table summarizes the results of Wilcoxon's signed-rank test (The significance level is 5%)**

The median of differences between	Sig	Decision
$\sigma_{NI}$ and $\sigma_{OCI}$ equals zero.	0.000	Reject the null hypothesis.
$\sigma_{NI}$ and $\sigma_{AFSI}$ equals zero.	0.309	Retain the null hypothesis.
$\sigma_{NI}$ and $\sigma_{FCT}$ equals zero	0.309	Retain the null hypothesis.
$\sigma_{NI}$ and $\sigma_{AR}$ equals zero	0.199	Retain the null hypothesis.

### **6.3 Results of testing hypothesis 2: default Risk and comprehensive income volatility**

Multiple linear regression is used to test the relationship between default risk proxied by Debt to equity following (Khan et al., 2016) and *CI* volatility and volatility of different *CI* components volatility. Estimation results are presented in table (5). Results show that there is a *positive* relationship between default risk and all comprehensive income components volatility as the

coefficients on *CI\_VOL* and its components (*NI\_VOL*, *OCI\_VOL*, *FCT\_VOL*, *AR\_VOL*, *AFSI\_VOL*) are *ALL* positive. These coefficients are: 2.299 for *CI\_VOL*, 5.012 for *NI\_VOL*, 1.673 for *OCI\_VOL*, 6.636 for *AFSI*, 11.477 for *FCT\_VOL*, and 4.952 for *AR\_VOL*. The highest *OCI* component coefficient is the *FCT* coefficient which means that it is the main contributor of default risk to insurance companies in Egypt. They are all statistically significant at the 5 percent level, consistent with Hypothesis 2. *So, the second hypothesis is accepted* that there is a positive relationship between default risk and comprehensive income volatility consistent with (Khan & Bradbury, 2016). This means that *CI* volatility is a main determinant of default risk and it has to be managed. So, *CI* can be used to predict the default risk for insurance companies. For the control variables, positive relationships exist between default risk and total liabilities *LOG\_TOT\_DEBT*, its coefficient is 4.142 that is statistically significant at 0.000% and cash flow volatility *CASH\_FLOWS\_VOL*, its coefficient is 5.323 that is statistically significant at 0.000%. For the other control variables, ROA and *LOG\_SIZE*, results show that there is a negative relationship between default risk and these two variables with coefficients -4.939 and -3.441 that is statistically significant at 0.000%. These results document that total liabilities, cash flow volatility, size and return on assets are important determinants of default risk in insurance companies consistent with previous literature. Results also show that Adjusted R Square is very high. It is 0.936 which means that about 94% of the change in the dependent variable (**comprehensive income volatility**) is explained by the change in the independent variable (**default Risk**). Also, the model as a whole is significant as sig (F) is 0.000.

**Table 5: Results of regression analysis between default risk and comprehensive income volatility**

Model		B	t	Sig.
1	(Constant)	-63.531	-9.600	Adjusted R Square
	<i>CI_VOL</i>	2.299	.485	.028
	<i>NI_VOL</i>	5.012	.540	.021
	<i>OCI_VOL</i>	1.673	.402	.026
	<i>AFSI_VOL</i>	6.636	5.481	.000
	<i>FCT_VOL</i>	11.477	15.092	.000
	<i>AR_VOL</i>	4.952	9.078	.000
	<i>LOG_TOT_DEBT</i>	4.142	40.019	.000
	<i>ROA</i>	-4.939	-57.124	.000
<i>LOG_SIZE</i>		-3.441	-10.931	.000
<i>CASH_FLOWS_VOL</i>		5.323E-9	19.959	.000
F				440.256
Sig.				.000
Adjusted R Square				.936

### 6.4 Results of testing hypothesis 3: liquidity risk & comprehensive income volatility

Multiple linear regression is used to test the relationship between liquidity risk proxied by Operating cash flow to current liability following (Khan & Bradbury, 2016) and CI volatility and volatility of different CI components. Current liabilities in insurance companies are the amounts of policyholder rights in the form of technical provisions.. Estimation results are presented in table (6). Results show that there is a *positive* relationship between liquidity risk and all comprehensive income components volatility as the coefficients of *CI\_VOL* and its components (*NI\_VOL*, *OCI\_VOL*, *FCT\_VOL*, *AR\_VOL*, *AFSI\_VOL*) are *ALL* positive. These coefficients are: 0.036 for *CI\_VOL*, 0.626 for *NI\_VOL*, 0.170 for *OCI\_VOL*, 0.329 for *AFSI*, 0.059 for *FCT\_VOL*, and 0.219 for *AR\_VOL*. The highest *OCI* component coefficient is the *AFSI* coefficient which means that it is the main contributor of liquidity risk to insurance companies in Egypt. They are all statistically

significant at the 5 percent level, consistent with Hypothesis 3. *So, the third hypothesis is accepted* that there is a positive relationship between liquidity risk and comprehensive income volatility consistent with (Khan et al., 2016). This means that *CI* volatility is a main determinant of liquidity risk and it has to be managed. So, *CI* can be used to predict the liquidity risk of insurance companies. For the control variables, positive relationships exist between liquidity risk and total liabilities *LOG\_TOT\_DEBT*, its coefficient is 1.34 that is statistically significant at 1% and cash flow volatility *CASH\_FLOWS\_VOL*, its coefficient is 1.73 that is statistically significant at 1%. For the other control variables, ROA and *LOG\_SIZE*, results show that there is a negative relationship between default risk and these two variables with coefficients -0.34 and -0.94 that is statistically significant at 1%. These results document that total liabilities, cash flow volatility, size and return on assets are important determinants of liquidity risk in insurance companies consistent with literature. Results also show that Adjusted R Square is 0.320 which means that about 32% of the change in the dependent variable (**comprehensive income volatility**) is explained by the change in the independent variable (**liquidity risk**). Despite the Fact that the value of Adjusted R square is not high, the model as a whole is significant as sig (F) is 0.000.

**Table 6: Results of Regression Analysis between liquidity risk and comprehensive income volatility**

		B	T	Sig.
1	(Constant)	7.819	8.761	.000
	<i>CI_VOL</i>	0.036	0.057	.025
	<i>NI_VOL</i>	0.626	0.500	.017
	<i>OCL_VOL</i>	0.170	0.302	.003
	<i>AFSL_VOL</i>	0.329	2.013	.045
	<i>FCT_VOL</i>	0.059	0.575	.026
	<i>AR_VOL</i>	0.219	2.974	.003
	<i>LOG_TOT_DEBT</i>	-1.341	-9.609	.000
	<i>LOG_CL</i>	1.008	-8.648	.000
	<i>LOG_SIZE</i>	-0.335	-7.891	.030

	<i>ROA</i>	-0.942	-8.023	.000
	<i>CASH_FLOWS_VOL</i>	1.728	4.806	.000
	F	15.075		
	Sig.	.000		
	Adjusted R Square	.320		

## 7. Conclusion

We examine the relationship between comprehensive income volatility and two dominant types of financial risks which are default risk and liquidity risk in Egyptian insurance companies. Using multiple regressions for 330 observations for the period 2010–2019 representing 33 insurance companies in Egypt which represent 84.6% of all insurance companies in Egypt, we find that comprehensive income (CI) is more volatile than net income and that greater CI volatility is associated with higher default risk and liquidity risk. This has important implications for insurance companies to manage the sources of volatility of comprehensive income components. Results also show that there is a positive relationship between CI volatility and default risk and liquidity risk. This has implications for insurance companies to mitigate the CI volatility to manage default and liquidity risks. This confirms that traditional earning volatility measures are no longer appropriate and new CI components have to be incorporated into the different risk analysis. Foreign currency translation is the main source of other comprehensive income volatility in insurance companies in Egypt in its relationship with default risk. This may be due to the freely floating the Egyptian Pound in November 2016 which reduced its value by almost 50% against the dollar and the great fluctuations that happened accordingly. We find available for sale investments the main source of other comprehensive income volatility in insurance companies in Egypt in its relationship with liquidity risk.

## References

- Abdelwahab, W., (2017) Measuring the incremental effect of comprehensive income and its components on improving value relevance of accounting information. Ain Shams University, *Accounting Literature 21* (4), 770–809. (In Arabic).
- Alhoshi, M., (2018) Examining the extent of superiority of comprehensive income as a measure of the corporate performance and its impact on cash dividends. Tanta University, *Accounting Research Journal 2*, 305–352. (In Arabic).
- Ali, I., (2019) Informational content of comprehensive income statement: Empirical study for the benefits of modifying Egyptian Accounting Standard No.(1) in 2015, Kafir Elsheikh University, *Contemporary Commercial Studies 6*, 456–498. (In Arabic).
- Bamber, L., Jiang J., Petroni K., and Wang. I., (2010). Comprehensive income: Who's afraid of performance reporting? *The Accounting Review 85*(1): 97–126.
- Bao, M., Billett, M., Smith, D., & Unlu, E. (2020). Does other comprehensive income volatility influence credit risk and the cost of debt? *Contemporary Accounting Research 1*. 457–484.
- Barth, M., Landsman W., and Wahlen J., (1995) Fair value accounting: Effects on banks' earnings volatility, regulatory capital, and value of contractual cash flows, *Journal of Banking 19*, 577–605.
- Black, D., and Cahan S., (2016) Other comprehensive income: A review and directions for future research. *Accounting and Finance 56*(1): 9–45.
- Chambers, D., Linsmeier T., Shakespeare C., and Sougiannis T. (2007). An evaluation of SFAS No. 130 comprehensive income disclosures. *Review of Accounting Studies 12*(4): 557–93.

- Chen, E., Gaviious, I., & Steinberg, N. (2019). Dividends from unrealized earnings and default risk. *Review of Accounting Studies*, 24(2), 491–535.
- De Weert, F. (2010). *Bank and insurance capital management* (Vol. 516). John Wiley & Sons, USA.
- Duverne, D., & Hele, J. (2016). How the Insurance Industry Manages Risk. *The Economics, Regulation, and Systemic Risk of Insurance Markets*, 55. Oxford University Press, United Kingdom
- Edwards, S., & Rigobon, R. (2009). Capital controls on inflows, exchange rate volatility and external vulnerability. *Journal of International Economics*, 78(2), 256–267.
- Financial Regulatory Authority,(2011) Annual Statistical Report, Egypt
- Financial Regulatory Authority,(2012) Annual Statistical Report, Egypt
- Financial Regulatory Authority,(2013) Annual Statistical Report, Egypt
- Financial Regulatory Authority,(2014) Annual Statistical Report, Egypt
- Financial Regulatory Authority,(2015) Annual Statistical Report, Egypt
- Financial Regulatory Authority,(2016) Annual Statistical Report, Egypt
- Financial Regulatory Authority,(2017) Annual Statistical Report, Egypt
- Financial Regulatory Authority,(2018) Annual Statistical Report, Egypt
- Financial Regulatory Authority,(2019) Annual Statistical Report, Egypt
- Hodder, L., Hopkins P., and Wahlen J. 2006. Risk–relevance of fair–value income measures for commercial banks. *The Accounting Review* 81 (2): 337–375.
- IASB, 2017, IFRS17, Insurance Contracts, London.
- IASB, 2018, Conceptual Framework of Accounting Theory , London.

- International Accounting Standards Board, (2009) Comment Letter Summary, IASB/ FASB Meeting July, IASB agenda reference: 17C. (International Accounting Standards Board, London).
- Jung, B., Soderstrom N., and Yang Y. (2013). Earnings smoothing activities of firms to manage credit ratings. *Contemporary Accounting Research* 30(2): 645–676.
- Khamis, H., (2018), Experimenting comprehensive income strength as a new measure of financial performance: Empirical evidence from Egyptian companies, Ain Shams University, *Accounting Literature* 22 (1), 86–122. (In Arabic).
- Khan, S., & Bradbury, M. (2012). Risk relevance of comprehensive income. In *2013 Financial Markets & Corporate Governance Conference*.
- Khan, S., & Bradbury, M. (2016). The volatility of comprehensive income and its association with market risk. *Accounting & Finance*, 56(3), 727–748.
- Khan, S., and Bradbury M., (2014), Volatility and risk relevance of comprehensive income, *Journal of Contemporary Accounting and Economics* 10, 76–85.
- Lee, Y., Petroni, K. and Shen M. (2006). Cherry picking, disclosure quality, and comprehensive income reporting choices: The case of property-liability insurers. *Contemporary Accounting Research* 23 (3): 655–692.
- Lin, S., Martinez, D., Wang, C., & Yang, Y. (2018). Is other comprehensive income reported in the income statement more value relevant? The role of financial statement presentation. *Journal of Accounting, Auditing & Finance*, 33(4), 624–646.
- Lundqvist, S., & Vilhelmsson, A. (2018). Enterprise risk management and default risk: Evidence from the banking industry. *Journal of Risk and Insurance*, 85(1), 127–157.



- Mansour, M., (2018), Explanatory and Predictive Power of Comprehensive Income and Net Income from Perspective of Accounting Information Characteristics, Tanta University, *Accounting Research Journal 1*, 153–169. (In Arabic)
- Ministry of Investment, (2015), Modified Egyptian Accounting Standards, 2015.
- S&P Global Ratings. (2008). Corporate Criteria: Analytical Methodology (April): 1–28.
- S&P Global Ratings. (2017). Criteria/Corporates/General: Corporate Methodology (October): 1–60.
- S&P Ratings Direct. (2007). Standard & Poor's Encyclopedia of Analytical Adjustments for Corporate Entities (July): 1–49. Yen, A. C., D. E. Hirst, and P. E. Hopkins. 2007. A content analysis of the comprehensive income exposure draft comment letters. *Research in Accounting Regulation 19*(1): 53–79.
- Youness, N., (2017) Using comprehensive income for predicting stock prices for rational investment decisions: Empirical Study, Ain Shams University, *Accounting Literature 21* (3), 1084–1111. (In Arabic).