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In the Name of God, the Compassionate, the Merciful

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Received articles will be published after professional referee, and being approved by the editorial board. Submission to this Journal is required to send at least two files include: an "Article cover" and an "Anonymous file of the main article", through systems, http://ijaaf.um.ac.ir/ .Submission of a manuscript implies that the paper has not been published before and it is not under consideration for publication elsewhere. Please pay attention to the following:

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- *Introduction* Some paragraphs contain explaining the problem, literature review, object (purpose), importance and necessity of it.
- *Literature review* a review of the literature investigates only related researches chronologically and the results exploit at the end of the section theory matrix or conceptual model that document research variables and Formulate research hypotheses.
- *Methodology* including Methods, data collection tools, population, sample size and sampling methods, analysis and model testing hypothesis, definition of study variables and operational definition of them can be in presented the same section that model testing is represented and there is no need to repeat.
- *Results* including the findings compare it with the findings of previous and interpretation of compliance or inconsistency of findings with research findings and theories.

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Editor's Note

I am pleased to announce that the Ferdowsi University of Mashhad is publishing Iranian Journal of Accounting, Auditing & Finance (IJAAF). On behalf of the board of the IJAAF and my co-editors, I am glad to present the Volume 1, Issue 1 of the journal in December 2017; the journal will publish four issues in a year. The board includes experts in the fields of accounting, finance and auditing, all of whom have proven track records of achievement in their respective disciplines. Covering various fields of accounting, *IJAAF* publishes research papers, review papers and practitioner oriented articles that address significant issues as well as those that focus on Asia in particular. Coverage includes but is not limited to:

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- Accounting education

Perspectives or viewpoints arising from regional, national or international focus, a private or public sector information need, or a market-perspective are greatly welcomed. Manuscripts that present viewpoints should address issues of wide interest among accounting scholars internationally and those in Asia in particular.

Yours faithfully,
Mahdi Moradi
Editor in Chief

Ferdowsi University of Mashhad

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Single Monetary Policy, Inflation Targeting, Interest Rate Targeting and Bank Efficiency in the Euro Area: Panel Generalized Method of Moments Approach

Ehsan Rajabi

Department of Agriculture and Food Policy, Agriculture Planning, Economic and Rural Development Research Institute (APERDRI), Ministry of Jihad-e Agriculture, Tehran, Iran

Reza Sherafatian Jahromi

Department of Economics, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

Abstract

This study investigates the dynamic linkages between the efficiency of 126 selected banks and the Single Monetary Policy (SMP) defined by credit channel, interest rate channel, exchange rate channel, and price stability in 17 Euro area countries from 1999 to 2012. The dynamic generalised method of moments (GMM) estimator shows a positive relationship between the bank's cost and profit efficiency and bank lending and liquidity by estimating the two-stage panel regression model. Still, capitalisation, exchange rate, inflation targeting (price stability), long term interest rate targeting was associated with lower cost and profit efficiency scores. Therefore, the impact of the Maastricht Protocol targeted policy, coefficients of inflation and long-term interest rate targeting variables are negatively related to the bank efficiency level. Specifically, on average higher bank lending, liquidity and deposit facility can be associated with improving profit efficiency of banks. In contrast, capitalisation, exchange rate, inflation targeting, and long-term interest rate targeting variables had a negative effect on cost and profit efficiency levels. The policy implication arising from the analyses presented is that the European monetary authority has faced significant pressures of inflation targeting and long-term interest rate targeting policy on bank performance that negatively influence bank efficiency.

Keywords

Inflation Targeting**,** Interest Rate Targeting**,** Credit Channel, Interest Rate Channel, Exchange Rate Channel, Price Stability

Corresponding author: Ehsan Rajabi
Email: *rajabi.ehsan63@gmail.com*

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1. Introduction

Since the first of January 1999, eleven mainland European countries have executed a uniform monetary policy, the members of the Economic and Monetary Union (EMU) attuned monetary and even fiscal policies to common targets. This common monetary policy is critical for permanent economic growth, investment decisions, and financial intermediation. Because of inflation management, exchange rate and interest rate significantly impact credit institute performance (like efficiency) by theoretical and empirical linkages. Otherwise, the introduction of the Euro seems to be a crucial stage in the process of rapid change within the financial structure of the European Union by improving the financial landscape to a substantial extent. Particularly in the banking sector, (international) mergers and acquisitions are frequent occurrences. European banks thereby not only expand their scale but also extend their scope of activities. These rapid modifications in banking structures, systems of financial markets, and behaviour offinancial agents make the management of the Single Monetary Policy by the European Central Bank (ECB) much more difficult. It is most likely that the monetary transmission mechanism of economies in the euro area will change further, which complicates the already difficult task of the new European monetary authorities. Consequently, it is essential to gain deeper insights into the monetary transmission mechanism and its linkage and influence on banking activity.

This issue will become more important when a single supervisory mechanism (SSM) for banks in the euro area is a future step in strengthening the EMU. The ultimate responsibility for specific supervisory tasks associated with banks' financial stability will lie with the ECB in the new single mechanism. Therefore, assigning the task of banking supervision to the ECB raises questions regarding the consequences for its primary mandate, Single Monetary Policy, on the euro area banking system. Consequently, the evaluation of ECB monetary policy is an option for the banking system to comprehensively assess the single monetary policy by ECB regarding bank efficiency. As a result, a comprehensive and extensive assessment of ECB policy (as monetary policy-maker) in the case of a single monetary policy could have discovered the weakness and strength of its operation and light up the darkness of newly attributed supervisory power under the European banking union. Therefore, this study will examine the influence of the Single Monetary Policy on banks' cost and profit efficiency in the euro area from 1999 to 2012.

The findings of the current study contributed to the body of knowledge. The empirical finding of studies about the track of bank efficiency from introducing the Euro to 2012 indicates the efficiency level differs over time and from one bank to another, one country to others. Furthermore, a consequence of a series of monetary policy channel factors (bank lending, liquidity and deposit facility, marginal lending facility, capitalisation, exchange rate, inflation targeting, and long-term interest rate targeting) demonstrate its significant influence on bank efficiency. In this path, this paper introduces two new variables in European banking literature for the first time. Inflation targeting and long-term interest rate targeting are external specific factors that influence the degree of efficiency of the bank from the environment in which the bank performs its activities. Introducing these two new variables is necessary because recognising and using factors that significantly influence banks' performance is vital for improving efficiency in the euro area banking market.

The rest of this paper is structured as follows. Section 2 briefly reviewed the literature. The research method is represented in section 3, followed by the result and discussion in section 4. Finally, conclusions depict in section 6.

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2. Literatures Review

In various countries, monetary policies are used as a powerful tool. However, the consequences are not always predictable. One of the most common ways to prevent unwanted consequences of monetary policies is determining the timeframes and how the policies may influence the country's economy. Commonly employed mechanisms are exchange rate effects, asset pricing effects, interest rate effects and the so-called credit channel.

Despite various research about this issue in the related literature, there is still no general agreement about how monetary policy can affect the economy. The impacts of monetary policies on an economy vary based on the country's level of development. Some channels, such as the exchange rate, can be less effective in countries with a single currency like the Eurozone Member States (see Angeloni et al. 2002).

Monetary policies can influence interest rates. For instance, tightening monetary policy increases interest rates and reduces investment (based on Keynesian theory). The increasing interest rate leads to alterations in asset prices (based on Monetarist theory). Moreover, in case of a reduction of money supply, people liquidate a portion of their equity holdings. Reduction in equity value leads to more challenging times for companies to raise funds to support their investment spending. On the other hand, any reduction in equity values results in a lower expenditure of customers as their wealth effect decreases. The upward pressure interest rate increase puts on the exchange rate causes the price of domestic products to be higher than the foreign products. In all of the above examples, the outcome will be lower demand and outputs (Mishkin, 1995).

Credit channels can be divided into bank lending and bank balance sheet channel. Both of the channels derive from failures of the Modigliani-Miller theorem for banks. The bank lending channel is based on the assumption that monetary policy impacts the liability of the bank. This leads to no substitute perfect in nature for loans in both asset and liability side of the balance sheet (see, among many others, Bernanke & Blinder, 1988; Bernanke & Gertler, 1995; Gertler & Gilchrist, 1993; Trautwein, 2000). Therefore, tightening monetary policy means a reduction of reversible liabilities.

It is questionable, however, whether or not the monetary policy in practice directly affects bank liabilities. The indirect influence of a change in monetary policy on total bank liabilities also remains not straightforward (Altunbaş, Bondt and Marques-Ibanez, 2004). Another critique of the bank-lending channel is that banks can easily switch to alternative forms of financing, issuing certificates of deposits that are sources of loan funding; for instance, by issuing certificates of deposits. A final critique is that banks can liquidate assets other than loans, most likely liquid assets, such as selling treasury securities to reduce their liabilities.

In theory, it can be said that the exchange rate affects the banks in two ways; directly and indirectly. Directly, the bank is affected through its assets' structure, foreign currency liabilities, and services that are not based on assets (Martin & Mauer, 2003). On the other hand, banks will be directly affected by the changes in the exchange rate in cases where they do not hold the same amount of foreign currency assets and liabilities (Sahminan, 2004).

In empirical studies, U.S. studies tend to show a relationship between bank capital and loan growth. They also demonstrate the impact of monetary policy on loan provision that depends on the degree of bank capitalisation. In contrast, the evidence on the transmission of monetary policy analysis in the euro area is somewhat inconclusive on whether bank capital matters for the impact of monetary policy on lending. In their studies, Kishan and Opiela (2000) display the effect of monetary policy on the provision and supply of loans in U.S. bank capital matters from a monetary policy perspective.

Turning to the euro area evidence, a bank-level panel data study by De Bondt(1999) finds some evidence favouring a bank lending channel in five-euro zone state members. The effect of monetary policy on bank lending behaviour generally depends on the size and liquidity of the bank. Although no evidence of a bank-lending channel was found in any of the countries, French banks were found to have used their excess capital to maintain lending levels. Ehrmann et al.(2001; 2003) show that, in contrast to bank liquidity, neither capitalisation nor bank size plays a role in distinguishing banks' lending behaviour in euro area countries.

The absence of capitalisation impacts and bank size has been explained by maintaining the informational asymmetries within the euro area to be lower than the U.S. Altunbaş Fazylov and Molyneux. (2002) show little evidence of a lending channel via either bank size or capital strength for Germany and France. In contrast, Gambacorta and Mistrulli (2003:2004) find evidence for Italy favouring bank lending and a bank balance sheet channel. The employment of quarterly data for 1992-2001 shows that well-capitalised Italian banks protect their lending from monetary policy shocks comparably better than other banks since they can access non-deposit fundraising more easily. They also find evidence of a mismatch between liabilities and assets in co-operative Italian banks that possess mature balance sheets; therefore, a substantial interest rate mismatch indicates the relatively strong monetary policy effects.

In addition, based on evidence provided by a significant number of recent research, the relevance of bank lending channels is more significant in some European countries than in the USA. This happens due to non-financial company's higher level of bank dependency and the centralisation of banking activities on a limited number of banks. The studies include researches conducted by Garretsen and Swank (1998) in the Netherlands, Escriva and Haldane (1994) in Spain, Dale and Haldane (1995) in the UK, and Buttiglione, Ferri and d'Italia. (1994) in Italy. Moreover, based on Chrystal and Mizen's(2002) findings, credit is pivotal in the UK's transmitting monetary process. Fuinhas(2008) found notable sectoral differences between monetary transmission channels of Portugal.

Furthermore, interest rate shocks generally have greater impacts on economic activities and happen faster in companies lending to individuals. The Garretsen and Swank (2003) study conducted in the Netherlands indicates an instant decrease of household loans with a rise in interest rates. The corporate loans were dropped in a similar situation, causing a delay. The fact that the decline in the household loan was not accompanied by a notable decline in consumer expenditure points to the limited degree of importance the bank lending channel has in the Netherlands' monetary policy transmission. Based on Cecchetti's(1999) arguments, the differences in the significance of credit channel is mostly a result of European countries' heterogeneous financial structure.

Other examples of such research carried out in different countries, including studies conducted by Ferri and Domac (1999), Ding, Domaç and Ferri. (1998), and Kim (1999) in South Korea. Based on these studies, South Korea has had an operative bank-lending channel, particularly before 1997's year-end financial crisis. The findings of Suetorsak's(2006) studies on some East Asian countries reveal the effect of monetary policies on bank decisions on micro-economic issues. Another notable research that Hachicha conducted and Lee (2009) in Egypt reveals the weakening of monetary policy transmission through interest rate channels in the short and, more importantly, the long run.

Lastly, another significant fact on the bank lending behaviour was found from Chu et al. (2007) findings. Based on their finding, banks' commitment with low degrees of capitalisation credit lines has decreased prior to Basle Accord's introduction. Moreover, based on Brooks et al. (2000) arguments, deregulation and re-regulation have case sensitive effects on the banking sector.

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According to these researches, bank-lending behaviour is affected by monetary policy measures and institutional reforms.

These studies point to the degree to which the central bank's activities change loan supply and the extent to which economies depend on the bank as the main factors determining the significance of the credit channel. In the literature of monetary policy, empirical and theoretical evidence supports the effectiveness of monetary transmission channel on bank lending, liquidity and capitalisation of a bank, so the study employs factors that can measure them as the variable that can affect bank efficiency for the first time in literature.

Because of the literature discussed, we can say that empirical studies in banking efficiency have been conducted extensively (for example, USA, Germany, and Spain) with financial variables and monetary policy; however, few studies have been done to investigate banking efficiency in European countries, especially for all the euro area countries with monetary policy variables. Therefore, more empirical work is needed on the banking efficiency in the euro area member states, and the major objective of this paper is "to investigate the impact of single monetary policy on banking efficiency by applying two-stage procedure to fill the gap of literature; in this region."

Therefore, this study will help you identify the bank performance (efficiency) when this study employs different measures of the ECB's primary monetary policy instrument (i.e., targeted inflation, interest rate stability, and so on), which is highly reliant on the set of macroeconomic changes. This investigation is mainly oriented on the Euro area's economy and banking efficiency from 1999 to 2012.

3. Research Methodology

To examine the correlations of bank efficiency with environmental variables and Single Monetary Policy of ECB, a two-step quantitative research design was employed to accomplish the purpose of the current study: Data Envelopment Analysis (DEA) and panel regression analysis (*i.e.* GMM). The DEA was employed to get the cost and profit efficiency scores of banks. Next, the efficiency scores generated from the DEA linear programing were used as independent variables in a panel regression model to explain bank performance, the dependent variable (Lehmann, Warning, & Weigand, 2004). Using panel regression, a non-parametric method and multivariate analysis may assist in understanding and validating behavioural relationships in the banking sector (Sanjavi, 2006). Therefore, the current study examines if there is a relationship between the efficiency of banks and the Single Monetary Policy of ECB in the euro area. For the second step, a linear regression model is estimated to be in the following form.

$$y_{it} - y_{it-1} = (1-\alpha)y_{it-1} + \beta(L)X_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

Where y_{it} represents the score of efficiency bank i at time t, X represents the set of the explanatory variable, η_i can be described as an unobserved specific effect of the country and ε_{it} can be described as an error term.

These international studies build a common frontier pooling the cross-country bank sand measuring the banking efficiency differences between countries considering environmental conditions. In other words, in existing studies that estimate the efficiency of banks in a cross-national scenario, the standard approach is to construct a common efficient frontier for all firms, considering their home country. However, this approach can compare the different banking systems on an unequal footing because it accounts for cross-country differences in regulation, economic and

demographic conditions, which are beyond the control of bank managers.

The present study focuses on the intermediation approach to construct the DEA frontier to estimate cost and profit efficiency scores. The inputs and outputs selected under the intermediation approach in the present study are summarised in Table 1. Under the intermediation approach (following Berger and Humphrey, 1992), we assume deposits (X_1): demand, savings, and time deposits, labour (X_2): staff of bank together with management expertise required for providing bank services, physical capital (X_3): offices, branches, and computer hardware as inputs and loans (Y_1): is the total amount of loans concerning each banking firm, investment (Y_2): total securities, equity investments and other investments as outputs.

Price of borrowed funds (w_1) was used as interest expenses over the sum of deposits price of labour(w_2) calculated by personnel expenses to the employees' number as the unit price of labour. Price of physical capital (w_3) was measured by non-interest expenses over fixed assets. Price of loan (p_1) was calculated by interest income on loans over the total loan. Price of investment (p_2) was measured by total non-interest operating income plus other interest income over other earning assets. Table 1 summarises inputs, outputs, and their prices employed to estimate the cost and profit efficiency by the DEA approach.

Table 1. Input, output, and prices under intermediation approach

Name (Symbol)	Description	Definition	Source
Deposits (X_1)	Deposits & short term funding	Sum of demand, savings, and time deposits	Bankscope
Labor (X_2)	Number of employees	Staff of bank	Bankscope
Physical capital (X_3)	Total fixed assets	Offices, branches, and computer hardware	Bankscope
Loan (Y_1)	Total loan	The sum of all loan accounts intermediated by banks less non-performing loans	Bankscope
Investment (Y_2)	Other earning assets	Total securities, equity investments and other investments	Bankscope
Price of borrowed fund (w_1)	Interest expenses over the deposit	Interest expenses over the sum of deposits	Bankscope
Price of labour (w_2	Personnel expenses over total labour	Average personnel expenses for each staff	Bankscope
Price of physical capital(w_3)	Non-interest expenses over fixed assets	Other operating expenses form total non-Interest expenses over fixed assets	Bankscope
Price of loan(P_1)	Interest income on loans over total loan	Average interest income of loan	Bankscope
Price of investment (P_2)	Total non-interest operating income plus other interest income over other earning assets	The average income of other earning assets	Bankscope

Since we assume that banks minimise cost in the euro area, we consider input-oriented efficiency with the variable return to scale in this study. The minimum cost is obtained by solving the DEA linear programming problem:

$$min \sum_{i=1}^{n} w_{io} x_i \qquad (2)$$

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$$subject\ to: \sum_{i=1}^{N} x_{ij}\lambda_j \leq x_i \quad (i = 1, 2, \dots, n)$$

$$\sum_{i=1}^{N} y_{rj}\lambda_j \geq y_{r0} \qquad (r = 1, 2, \dots, m)$$

$$\sum_{j=1}^{n} \lambda_j = 1$$

$$\lambda_j \geq 0 \qquad (j = 1, 2, \dots, N)$$

where $j = 1, \dots, N$ are the number of banks, $i = 1, \dots, n$ are input volumes used by bank j, $r = 1, 2, \dots, m$ measures the volume of output r and w_{io} is the unit cost of the input i of bank DMU_o which is the benchmark projection that can be different from one bank to another. Although the objective is to choose the $x_i$andλ_j values to minimise the total cost of satisfying the output constraints. The w_{io} in the objective represent unit costs. The minimisation problem is calculated for each bank and year in the sample, thus identifying a benchmark combination of inputs and cost.

Every DEA model assumes returns-to-scale characteristics that are represented by the ranges of the sum of the intensity vector λ, *i.e.*, $L \leq \lambda_1 + \lambda_2 + \dots + \lambda_n \leq U$. Here, we compute variable returns to scale and use $L = U = 1$. We consider convex hull representation. Our model allows substitutions in inputs. Based on an optimal solution (x^*, λ^*) of the above problem, the cost efficiency of DMU_o is defined as

$$CE_o = \frac{C_{min}}{C_o} = \frac{\sum_{i=1}^{n} w_{io} x_i^*}{\sum_{i=1}^{n} w_{io} x_{io}} \tag{3}$$

Where CE_o is the ratio of the minimum cost to observed cost for the othfirm. This approach implies that all observed input-cost combinations are measured with no error. Outliers may be classified as very efficient simply because of data error.

Similar to cost efficiency, the profit efficiency (PE) can be estimated by solving the following linear programming problem n times; each time for a different bank in the sample. Therefore, the profit-maximization problem of a multiple-output, multiple-input firm facing input and output prices w and p, respectively, can be formulated as the following DEA problem:

$$\pi = py^* - wx^* = max \sum_{r=1}^{m} p_r y_r - \sum_{i=1}^{n} w_i x_i \tag{4}$$

$$subject\ to: \sum_{j=1}^{N} x_{ij}\lambda_j \leq x_i \quad (i = 1, 2, \dots, n)$$

$$\sum_{j=1}^{N} y_{rj}\lambda_j \geq y_r \quad (r = 1, 2, \dots, m)$$

$$\sum_{j=1}^{N} \lambda_j = 1$$

$$\lambda_j \geq 0 \qquad (j = 1, 2, \dots, N)$$

The profit efficiency of DMU_O is defined as the ratio between the observed profits and the

maximum profits as follows:

$$PE_O = \frac{\pi_o}{\pi_{max}} = \frac{\sum_{r=1}^{m} p_{ro} y_{ro} - \sum_{i=1}^{n} w_{io} x_{io}}{\sum_{r=1}^{m} p_r y_r^* - \sum_{i=1}^{n} w_{io} x_i^*} \quad (5)$$

For measuring Single Monetary Policy, this research applies variables that have the proxy to credit channel, interest rate channel, exchange rate channel, and price stability.

To reflect the variables as explained in Table 2. equation 2 is extended, and the baseline regression model is developed as below:

$$\begin{aligned} \mathrm{EF}_{ijt} = \alpha + \lambda\, \mathrm{EF}_{ijt-1} + \beta_1 \ln(LEND)_{ijt} + \beta_2 CAP_{ijt} + \beta_3 LQUID_{ijt} \\ + \beta_4 DINTRS_{ijt} + \beta_5 MINTRS_{ijt} + \beta_6 REXCH_{ijt} + \beta_7 INFLT_{ijt} \\ + \beta_8\, LINTRS_{ijt} + \eta_j + \varepsilon_{ijt} \end{aligned} \quad (6)$$

$$i = 1, \dots, 126, t = 1, \dots, 14\ j = 1, \dots 17$$

As already recorded, EF is cost and profit efficiency of bank i at time t for country j that was estimated by Data Envelopment Analysis (DEA). Therefore, this model was estimated two times for cost and profit efficiency.

Credit channel measured by $(LEND)$ which is defined by domestic credit provided by banking sector for each Member States, (CAP), which is defined by bank capital and reserves to total assets for each Member States, and $(LQUID)$, which is defined by liquid assets such as cash, interbank lending, and securities to total assets for each Member States. Based on assumptions of bank lending channel literature, less capitalised or less liquid bank has more problems to compensate monetary policy caused reduction in deposits. Therefore, it should respond more strongly than a bank with a higher value of the corresponding bank characteristic. This would indirectly suggest positive coefficients regarding interaction terms.

The interest rate channel is another channel through that ECB can affect bank performance, so deposit facility $(DINTRS)$ and marginal lending facility $(MINTRS)$ be used as a measurement of monetary policy for the operational framework of the Euro-system instrument. By applying these interest rates, ECB offers a standing facility as an instrument set for controlling the money market to obtain overnight liquidity from banks.

The exchange rate channel can be measured by ECB reference exchange rate; US dollar/Euro$(REXCH)$.Regarding the exchange rate of the Euro, the ECB is the main authority that is responsible for Euro's management. Therefore, based on Single Monetary Policy that ECB has chosen, exchange rate policy can affect bank efficiency.

The ECB keeps price stability in the euro area by monetary policy to achieve economic growth without inflation. For a sustainable degree of price stability over one year, an unweighted arithmetic average inflation rate should not go beyond more than one and a half percentage points that of, at most, the three performing Member States with the lowest HICP inflation. Therefore, this paper tries to measure price stability $(INFLT)$as the main objective of monetary policy by the difference between the actual level of the average rate of inflation (HICP) and reference value (defined in the Maastricht Protocol), this variable is defined in terms of the time *t* expected difference between Member States inflation (yearly) and the euro area targeted values (2% in the medium term), respectively.

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Finally, long-term interest rate developments ($LINTRS$) is the euro area control variable measured by the difference between the actual level of average yields for 10-year government bonds and reference value (defined in the Maastricht Protocol). This variable is defined for the criterion on the convergence of interest rates referred to Maastricht Protocol that said, a Member State has had an average nominal long-term interest rate that does not exceed by more than two percentage points that of, at most, the three best performing Member States in terms of price stability.

Table 2. Measurements of single monetary policy

Variable	Symbol	Name	Description	Source	Expected sign
Credit channel	$LEND$	Bank lending	Domestic credit provided by the banking sector for each Member States (USD)	WB	+
	CAP	Capitalisation	Bank capital (capital and reserves) to total assets for each Member States (%)	IMF	+
	$LQUID$	Liquidity	Bank liquid reserves to bank assets ratio for member states (%)	IMF	+/-
Interest rate channel	$DINTRS$	Deposit facility	Deposit facility in percentages per annum by ECB	ECB	-
	$MINTRS$	Marginal lending facility	The marginal lending facility in percentages per annum by ECB	ECB	-
Exchange rate channel	$REXCH$	Exchange rate	ECB reference exchange rate, US dollar/Euro by ECB	ECB	-
Price stability	$INFLT$	Inflation targeting	Difference between the actual level of the average rate of inflation (HICP) and reference value (defined in the Maastricht Protocol)	Eurostat	-
Euro area control variable	$LINTRS$	Long-term interest rate targeting	Difference between the actual level of average yields for 10yr government bonds and reference value (defined in the Maastricht Protocol)	Eurostat	-

Note: The author introduces inflation targeting and long-term interest rate targeting variables.

WB: World Bank national accounts data, ECB: European central bank, Statistical Data Warehouse, IMF: International Monetary Fund, Global Financial Stability Report, Eurostat: statistical office of the European Union.

Table 2 presents measurements of Single Monetary Policy, source, expected sign of them for all 126 selected banks from all 17-euro area Member States including Spain, Austria, Cyprus, Slovenia, Belgium, Portugal, Estonia, the Netherlands, Finland, Malta, France, Luxembourg, Germany, Italy, Ireland, and Greece from 1999 to 2012. All variables are all 17-euro area member states including Spain, Austria, Cyprus, Slovenia, Belgium, Portugal, Estonia, the Netherlands, Finland, Malta, France, Luxembourg, Germany, Italy, Ireland, and Greece from 1999 to 2012“Bankscope” database of BVD-IBCA, Eurostat, World Bank, ECB from 1999 to 2012 were the source of our data.

4. Results and Discussion

This section provides evidence to explain the effect of the Single Monetary Policy on the

efficiency of the euro area banking sector by analysing 126 banks during the 1999-2012 period[1]. The empirical results are presented following the two-step procedure of the study. The first step is to obtain the efficiency levels by the Data Envelopment Analysis (DEA). The second step is to examine the determinants of efficiency (Single Monetary Policy variables) through regression analysis by GMM estimation. Table 3 reports the results of the DEA models to estimate cost and profit efficiency and score using the entire 126-listed bank dataset for 17-euro area Member States from 1999 to 2012. From Table 3, it can be observed that the mean of the cost efficiency for four banks is 100 %, and the profit efficiency mean for eleven banks are 100 % across the time availability period. For four banks, the mean of the cost and profit efficiency is 100 % efficient. These four banks are "DNB Pank AS" from Belgium, "BPCE Group" from France, "BNG" and "Nederland Waterscapes bank" for the Netherlands. The lowest cost efficiency mean is 7.17% for Luxembourg, and profit efficiency is 0.73% for the same country.

Table 3. Summary of cost and profit efficiency across-listed bank estimated by DEA from 1999 to 2012

No.	Country	No. of bank	List of bank	Mean of cost-efficiency	Mean of profit efficiency
1	Austria	6	Erste Group Bank AG	30.38	10.21
			RaiffeisenZentralbankOesterreich AG – RZB	17.92	7.98
			BAWAG PSK Group	18.86	5.59
			RaiffeisenlandesbankOberösterreich AG	14.95	1.85
			RaiffeisenlandesbankNiederösterreich-Wien AG	22.31	4.37
			OesterreichischeVolksbanken AG	15.75	3.56
2	Belgium	6	AXA Bank Europe SA/NV	17.52	2.10
			Bank of New York Mellon SA/NV	14.03	0.04
			BelfiusBanque SA/NV-Belfius Bank SA/NV	30.98	6.04
			Dexia	88.02	79.00
			Investar-InvesteringsmaatschappijArgenta	21.13	34.34
			KBC Groep NV/ KBC Groupe SA-KBC Group	34.83	13.74
3	Cyprus	3	Bank of Cyprus Public Company Limited-Bank of Cyprus Group	9.62	6.15
			Co-operative Central Bank Limited	28.91	9.87
			Hellenic Bank Public Company Limited	17.10	3.43
4	Estonia	3	DNB Pank AS	100	100
			SEB Pank	27.06	1.14
			Swedbank As	12.68	2.12
5	Finland	3	Danske Bank Plc	18.92	3.31
			Nordea Bank Finland Plc	45.21	46.91
			OP-Pohjola Group	16.34	2.68
6	France	11	Banque PSA Finance	38.97	6.28
			BNP Paribas	87.5	100
			BPCE Group	100	100
			BPIFranceFinancement	22.61	3.40
			CréditAgricole S.A.	94.39	73.76
			CréditAgricole-CréditAgricole Group	77.78	100
			Credit Mutuel (Combined - IFRS)	65.03	21.13

1 We choose an unbalanced panel rather than a balanced panel, to take banks gone into bankrupt or those being absorbed into account. Indeed, the use of a balanced panel may overestimate cost efficiency as it ignores these banks, which may be less efficient on average.

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Table 3. Continued

No.	Country	No. of bank	List of bank	Mean of cost-efficiency	Mean of profit efficiency
6	France	11	HSBC France	14.17	18.44
			La BanquePostale	7.24	3.84
			Natixis	57.05	44.68
			SociétéGénérale	59.05	23.58
7	Germany	26	Aareal Bank AG		
			BayerischeLandesbank		
			Commerzbank AG		
			DekaBank Deutsche Girozentrale	32.4	12.68
			Deutsche Apotheker- und AerztebankeG	66.36	26.29
			Deutsche Bank AG	88.22	77.56
			DZ Bank AG-Deutsche Zentral-	26.04	17.17
			Genossenschaftsbank	15.31	5.88
			HASPA Finanzholding	85.71	100
			HSH Nordbank AG	48.35	19.51
			Hypo Real Estate Holding AG	14.86	2.75
			IKB Deutsche Industriebank AG	54.77	16.08
			KfWBankengruppe-KfW Group	99.54	100
			Landesbank Baden-Wuerttemberg	22.30	20.44
			Landesbank Berlin Holding AG-LBB	97.34	87.50
			Holding AG	44.34	24.56
			Landesbank Hessen-ThueringenGirozentrale	19.99	3.41
			– HELABA	43.76	7.66
			Landeskreditbank Baden-Wuerttemberg -	27.22	27.05
			Förderbank-L-Bank	92.82	100
			LandwirtschaftlicheRentenbank	81.07	71.70
			MünchenerHypothekenbankeG	46.87	6.06
			NorddeutscheLandesbankGirozentrale	44.70	49.31
			NORD/LB	15.15	6.01
			NRW.BANK	39.73	26.18
			SEB AG	15.16	6.06
			Volkswagen Financial Services AG	88.09	100
			WGZ-Bank AG	23.27	29.89
			WestdeutscheGenossenschafts-Zentralbank	27.01	16.40
			Wuestenrot Bank AG Pfandbriefbank		
			Wüstenrot&Württembergische		
			WüstenrotBausparkasse AG		
8	Greece	4	Alpha Bank AE	11.59	4.32
			EurobankErgasias SA	12.50	5.22
			National Bank of Greece SA	9.97	6.60
			Piraeus Bank SA	10.88	1.95
9	Ireland	5	Allied Irish Banks plc	33.62	15.31
			Bank of Ireland-Governor and Company of	51.42	17.16
			the Bank of Ireland	100	100
			Merrill Lynch International Bank Limited	23.75	7.78
			Permanent TSB Plc	14.29	5.61
			Ulster Bank Ireland Limited		

Table 3. Continued

No.	Country	No. of bank	List of bank	Mean of cost-efficiency	Mean of profit efficiency
10	Italy	15	BancaCarigeSpA Banca Monte deiPaschi di Siena SpA-Gruppo Monte deiPaschi di Siena Bancapopolaredell'Emilia Romagna BancaPopolare di Milano SCaRL BancaPopolare di SondrioSocietaCooperativa per Azioni BancaPopolare di Vicenza Societacooperativa per azioni BancoPopolare - SocietàCooperativa-BancoPopolare CreditoEmilianoSpA-CREDEM CreditoValtellineseSoc Coop Iccrea Holding SpA IntesaSanpaolo MediobancaSpA UniCreditSpA Unione di BancheItalianeScpa-UBI Banca Veneto Bancascpa	13.78 44.63 11.62 10.68 12.82 14.43 31.13 10.24 12.82 13.82 81.21 29.72 84.06 33.10 15.80	3.19 10.63 3.98 3.18 1.80 1.69 3.43 1.71 1.32 2.06 98.78 8.16 90.73 6.03 1.22
11	Luxembourg	6	BanqueInternationale à Luxembourg SA Clearstream Banking SA KBL European Private Bankers SA RBC Investor Services Bank S.A. State Street Bank Luxembourg S.A UBS (Luxembourg) SA	9.63 65.27 7.17 10.07 29.77 23.34	14.80 51.39 1.95 0.73 79.92 12.15
12	Malta	3	Bank of Valletta Plc HSBC Bank Malta Plc Raiffeisen Malta Bank Plc	16.01 16.11 84.76	4.41 3.84 100
13	Netherlands	6	Bank NederlandseGemeenten NV, BNG ING Bank NV Nederlandsche Bank NV (De) NederlandseWaterschapsbank NV Rabobank Nederland-Rabobank Group SNS Bank N.V.	100 94.05 44.07 100 92.91 31.54	100 100 37.77 100 77.86 5.71
14	Portugal	4	Banco BPI SA BancoComercialPortuguês, SA-Millennium bcp BancoEspirito Santo SA CaixaGeral de Depositos	15.68 16.46 15.88 19.15	1.44 2.58 3.26 2.98
15	Slovakia	3	Slovenskasporitel'na as-Slovak Savings Bank Tatra Banka a.s. VseobecnaUverova Banka a.s.	9.73 12.67 11.19	3.44 3.14 3.26
16	Slovenia	4	AbankaVipadd NLB dd-Nova Ljubljanska Banka d.d. Nova Kreditna Banka Maribor d.d. SID - Slovene Export and Development Bank, Inc,	27.22 11.03 20.03 44.92	3.00 3.00 2.15 28.35

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Table 3. Continued

No.	Country	No. of bank	List of bank	Mean of cost-efficiency	Mean of profit efficiency
17	Spain	18	Banco Bilbao VizcayaArgentaria SA		
			Banco de Sabadell SA		
			BancoFinanciero y de Ahorros SA-Bankia	60.06	23.29
			Banco Mare Nostrum SA-BMN	20.66	4.34
			Banco Popular Espanol SA	65.62	15.18
			Banco Santander SA	18.68	2.78
			Bankia, SA	30.62	9.25
			Bankinter SA	96.31	84.04
			Caixabank, S.A.	57.57	12.93
			Caja de Ahorros y Monte de Piedad de	15.73	3.45
			Zaragoza, Aragon y Rioja-Ibercaja	67.07	12.75
			Caja de Ahorros y Pensiones de Barcelona-LA	15.09	3.42
			CAIXA	62.35	24.07
			CajaEspana de Inversiones Salamanca y	10.90	1.48
			SoriaCaja de Ahorros y Monte	12.14	1.81
			Caja Rural de Aragón SociedadCooperativa de	25.36	53.77
			Crédito	23.51	5.70
			CatalunyaBanc SA	14.62	1.88
			Deutsche Bank SAE	15.79	2.26
			Kutxabank SA	15.93	2.71
			Liberbank SA		
			Santander Consumer Finance		

Efficiency score is in percentage

Table 4. Descriptive summary of single monetary policy variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Bank lending(LEND)	1142	27.213	2.000	21.295	29155
Capitalization (CAP)	1142	5.483	1.620	2.7	13.3
Liquidity (LQUID)	1142	4.888	8.494	0.027	6.942
Deposit facility (DINTRS)	1142	1.259	1.098	0.000	3.75
Marginal lending facility (MINTRS)	1142	2.940	1.275	1.5	5.75
Exchange rate (REXCH)	1142	1.308	0.138	0.881	1.472
Inflation targeting (INFLT)	1142	0.907	1.019	-2.53	8.03
Long-term interest rate targeting (LINTRS)	1142	0.352	1.881	-3.03	17.97

The baseline regression results focusing on the relationship between bank cost efficiency and the explanatory variables (Single Monetary Policy) are presented in Table 5. We report the results for both difference and system GMM estimator for both one-step and two-step versions. A lot of applied work using the GMM estimator has focused on results for the two-step estimator than the one-step estimator because the standard covariance matrix is robust to panel-specific autocorrelation and heteroscedasticity. This paper has focused on a two-step estimator, which suggests a very modest efficiency gain than the one-step version. Nevertheless, the one-step estimator was reported in all GMM estimation tables. System panel GMM requires more assumptions (employed to generate consistent and efficient parameters) than the first difference panel GMM. Still, if the assumptions hold, it will achieve greater efficiency. Therefore, system

panel GMM estimations are focused on while the first difference panel GMM are presented in all tables. In the baseline estimation, the endogeneity problem of bank lending variable (domestic credit provided by banking sector US$) is controlled, instrumented with GMM-style instruments, *i.e*. lagged values of the variables in levels. Although, for controlling a huge number of the instrument, which is a real danger of overfitting the endogenous variables when the period is long, GMM has instructed to use only one lag depth for the endogenous variables as instruments. Furthermore, the number of instruments is less than cross-sectional observations (banks) when the rule of thumb keeps the number of instruments less than or equal to the number of groups. Finally, several diagnostic tests are performed to show that results are warranted.

Table 5. Baseline analysis for the effect of single monetary policy on cost efficiency (controlling endogeneity)

Regressors	GMM-DIF One-step	GMM-DIF Two-step	GMM-SYS One-step	GMM-SYS Two-step	GMM-SYS♣ One-step	GMM-SYS♣ Two-step
Initial of cost efficiency (L1)	0.348*** (0.000)	0.348*** (0.000)	0.452*** (0.000)	0.452*** (0.000)	0.442*** (0.000)	0.439*** (0.000)
Bank lending[1]	-0.167*** (0.000)	-0.164*** (0.000)	0.012*** (0.000)	0.012*** (0.000)	0.008*** (0.000)	0.008*** (0.000)
Capitalization	0.004 (0.561)	0.004*** (0.000)	-0.010* (0.106)	-0.010*** (0.000)	-0.012** (0.042)	-0.013*** (0.000)
Liquidity	0.002* (0.094)	0.002*** (0.000)	0.001 (0.372)	0.001*** (0.000)	0.000 (0.755)	0.000*** (0.000)
Deposit facility	0.076*** (0.000)	0.075*** (0.000)	0.030** (0.018)	0.030*** (0.000)	0.035*** (0.005)	0.035*** (0.000)
Marginal lending facility	-0.062*** (0.000)	-0.062*** (0.000)	-0.011 (0.289)	-0.012*** (0.000)	-0.006 (0.555)	-0.006*** (0.000)
Exchange rate	0.169*** (0.003)	0.169*** (0.000)	-0.060* (0.081)	-0.056*** (0.000)	-0.064** (0.043)	-0.063*** (0.000)
Inflation targeting	-0.001 (0.776)	-0.002*** (0.000)	-0.012 (0.012)	-0.012*** (0.000)	-0.011** (0.017)	-0.012*** (0.000)
Long-term interest rate targeting	0.001 (0.597)	0.001*** (0.000)	-0.008 (0.005)	-0.008*** (0.000)	-0.011*** (0.000)	-0.011*** (0.000)
Sargan test (*p*-value)[2]	0.000	0.144	0.000	0.398	0.000	0.509
Serial correlation test: AR(1) (*p*-value)[3] AR(2) (*p*-value)	 0.000 0.381	 0.000 03499	 - -	 0.000 0.195	 - -	 0.000 0.337
Wald test for joint significance (*p*-value)	0.000	0.000	0.000	0.000	0.000	0.000
No. of instruments	97	97	121	121	122	122
Cross-sectional observations	123	123	126	126	126	126

Note: ♣The regressions also include time trend variables for the different periods that are not reported.
[1]In the regression, this variable is included as log (variable).
[2]The null hypothesis is that model, and overidentifying conditions are correctly specified.
[3]The null hypothesis is that there is no serial correlation in the first-differenced disturbances.
Values in parenthesis are *t*-statistics.
***,**,* indicates significance at 1%,5% and 10% levels respectively.

The model performs reasonably well, with most of the variables remaining sable across the various regressions tested. For all the GMM estimation models discussed in the following subsections, the Sargent test (under Sargent thought) for overidentifying restriction and the

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Arrelano-bond (AR(2)) test shows that at the 5% significance level, our instruments are appropriately orthogonal to the error and no second-order serial correlation is detected, respectively (see Baum et al. 2010)[1],[2]. The first two columns of Table 5 report the results for GMM-DIF, and the next two columns report GMM-SYS, respectively. Using the first-differenced GMM estimator in this panel, the coefficient on the lagged cost-efficiency variable is only 0.3484, suggesting implausibly low returns to scale. Using the system GMM estimator, which exploits the moment conditions, the coefficient on the lagged cost-efficiency variable is 0.4522. It could be argued that a certain level of accumulated knowledge and technological endowment, which may represent by the previous year's efficiency, help banks generate higher outputs with their inputs by adapting relatively quickly to the changes brought about by the environmental conditions.

The coefficients of all single monetary policy variables are significant at least at 1% level system panel GMM in the two-step version. Hence credit channel, interest rate channel, exchange rate channel and price stability factors play an important role in determining cost efficiency.

In the first set of variables, to capture the credit channel and its correlation with bank cost efficiency, the bank lending variable has a positive sign, indicating higher domestic credit provided by the banking sector contributes to lower banking costs. Higher bank lending ability contributes to a decrease in banking costs, causing higher cost-efficiency. Furthermore, the bank lending channel (BLC) has focused on the possible effect of monetary policy actions on the supply of loans by affecting the liability side of bank balance sheets. According to theory, an expansionary monetary policy increases reservable liabilities, leading banks to increase lending due to the growth of funding sources. In other words, the significant and positive coefficient of bank lending variable justifies single monetary policy influence on bank efficiency from bank lending channel linkage.

The negative sign of capitalisation shows that the higher the bank capital to total assets ratio is, the higher the operating and financial costs are. Therefore, a higher ratio of capital to assets in the banking system can be associated with somewhat lower efficiency levels, indicating that the bank operates in a high capitalisation banking sector ratio (high capital adequacy ratio) is not enabled to offer more output (loan and profit) and finally improves cost-efficiency. The reaction term between banking system liquidity and cost efficiency is also positive and significant, indicating that an increase in the liquidity ratio of the banking sector increases bank efficiency. These findings signal that sound banking characteristics in terms of liquidity play an important role in influencing the banks' cost efficiency. The second set of variables was used to capture standing facility instruments of a single monetary policy by ECB. The sign of the deposit facility variable coefficient is positive, while the marginal lending facility variable has a negative coefficient (-0.0307).

Standing facilities aim to provide and absorb overnight liquidity, signal the general monetary policy stance, and bound overnight market interest rates. Two standing facilities, deposit and marginal lending facilities, are available to eligible counterparties on their own initiative. Counterparties can use the marginal lending facility to obtain overnight liquidity from the NCBs against eligible assets. The interest rate on the marginal lending facility normally provides a ceiling for the overnight market interest rate. Also, counterparties can use the deposit facility to make overnight deposits with the NCBs. The interest rate on the deposit facility normally provides a floor for the overnight market interest rate. Our results underline that bank costs may increase when the

1-Baum et al. (2010) points out that in a dynamic panel data context, first order serial correlation could be expected, but the second-order serial correlation should not be detected if the instruments are appropriately uncorrelated with the error term.

2- The Sargent test is most common diagnostic utilized in GMM estimation to evaluation the suitability of the model. A rejection ofthe null hypothesis implies that the instrument is not satisfying the orthogonality condition required for their employment (Baum at al. 2007).

marginal lending facility is higher because the overnight interest rate can increase up to its ceiling rate. Therefore, higher marginal lending facility contributes to an increase in banking costs, causing lower cost efficiency.

Similarly, under normal circumstances, there are no deposit limits or other restrictions on counterparties' access to the facility; the deposit facility provides a minimum interest rate that makes cheaper loanable fund costs for banks that desire to pay more at the interbank market overnight interest rate will close. Consequently, the relationship between deposit facility and cost efficiency is straightforward: increased deposit facility has forced banks to become more efficient.

The third set of variables representing the reference exchange rate of the Eurozone consists of the following variable. The coefficient on the *exchange rate* has an expected negative sign, indicating that a higher amount of exchange rate (the increase of the value of a national currency) increases banking costs (*i.e.*, decrease in cost efficiency). In essence, the empirical findings suggest that in the case of the euro area banking system, the value of foreign assets, including loans, reserve and investment security, will be negatively affected by increased exchange rate. As a result, the negative relationship between exchange rate and bank efficiency may reflect how fluctuating and volatile exchange rates may have contributed to the asset profile of banks (the increased risk of exchange rate fluctuations in banking operations) and have reduced the cost-efficiency.

To investigate the relationship between Maastricht Protocol targeted policy and the Eurozone bank efficiency, inflation and long-term interest rate targeting variables are introduced as explanatory variables in cost efficiency model regressions. The sign of the inflation targeting variable is negative (-0.0124), the same as the long-term interest rate targeting variable coefficient (-0.0086). The results have indicated an increasing difference between the actual level of the average rate of inflation (HICP) and the unweighted arithmetic average of the inflation rate in three best performing Member States in terms of price stability is associated with decreasing bank efficiency at the domestic country level. In addition, the difference between the actual level of average yields for 10-year government bonds and the unweighted arithmetic average of the long-term interest rates of the same three Member States was used to calculate the reference value for the criterion on price stability have a negative impact on bank efficiency. Those two variables relate to sustainable convergence for ensuring that economic development within EMU is balanced and does not give rise to tensions between the EU Member States.

Maintaining stable prices (the primary objective of the Single Monetary Policy) on a sustained basis is a crucial precondition for increasing economic welfare and an economy's growth potential. This enables the bank to make better-informed decisions on costs and investment. In turn, this allows the banks to allocate resources more efficiently and divert resources to productive uses. But, in a high inflation environment, the bank should pay more for production inputs to produce a certain level of outputs that have decreased bank efficiency. Furthermore, suppose investors cannot be sure that prices will remain stable in the future (i.e., associating inflation risk premium). In that case, they will not demand nominal assets (money or some financial assets) over the long term, which have increased the price of deposits and funds for the bank, resulting in lower cost-efficiency. Overall, this measure of price stability does significantly explain bank efficiency positively because achieving the best performing Member States in terms of price stability might affect the ability of the bank to perform better. The negative sign of the long-term interest rate targeting coefficient suggests that the higher difference of long-term government bonds interest rate from the reference value contributes to higher banking costs (*i.e.*, decrease in cost efficiency). The core reason for this may be that high-interest government bonds negatively influence borrowing deposit costs for the bank over the long term. When government funds a deficit by issuing high-interest rate government

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bonds, it can increase interest rates across the market because government borrowing creates a higher demand for credit in the financial markets. Therefore, the cost of borrowing deposits will be increased for a bank to increase banking costs. The paper also explains the association of profit efficiency with efficiency correlates, namely credit channel, interest rate channel, exchange rate channel, price stability and the euro area control variables. The first two columns of Table 6 presents the results for first-difference panel GMM and next two columns report system panel GMM, respectively. Using the first-differenced GMM estimator in this panel, the coefficient on the lagged profit efficiency variable is only 0.3922, suggesting implausibly low returns to scale.

Table 6. Baseline analysis for the effect of single monetary policy on profit efficiency (controlling endogeneity)

Regressors	GMM-DIF One-step	GMM-DIF Two-step	GMM-SYS One-step	GMM-SYS Two-step	GMM-SYS♣ One-step	GMM-SYS♣ Two-step
Initial of profit efficiency (L1)	0.391*** (0.000)	0.392*** (0.000)	0.418*** (0.000)	0.421*** (0.000)	0.404*** (0.000)	0.410*** (0.000)
Bank lending[1]	-0.128*** (0.008)	-0.126*** (0.000)	0.012*** (0.000)	0.012*** (0.000)	0.011*** (0.000)	0.011*** (0.000)
Capitalization	0.001 (0.912)	0.001*** (0.000)	-0.009 (0.272)	-0.009*** (0.000)	-0.010 (0.226)	-0.009*** (0.000)
Liquidity	0.001 (0.520)	0.001*** (0.000)	0.000 (0.766)	0.000*** (0.000)	0.000 (0.996)	-0.000 (0.511)
Deposit facility	-0.010 (0.684)	-0.010*** (0.000)	-0.052*** (0.002)	-0.051*** (0.000)	-0.050*** (0.002)	-0.049*** (0.000)
Marginal lending facility	0.008 (0.716)	0.009*** (0.000)	-0.053*** (0.000)	0.518*** (0.000)	0.056*** (0.000)	0.054*** (0.000)
Exchange rate	-0.003 (0.959)	-0.003*** (0.000)	-0.183*** (0.000)	-0.175*** (0.000)	-0.193*** (0.000)	-0.184*** (0.000)
Inflation targeting	-0.000 (0.950)	-0.000*** (0.000)	-0.009 (0.137)	-0.009*** (0.000)	-0.008 (0.178)	-0.008*** (0.000)
Long-term interest rate targeting	-0.001 (0.842)	-0.000*** (0.000)	-0.008** (0.034)	-0.008*** (0.000)	-0.010*** (0.014)	-0.009*** (0.000)
Sargan test (*p*-value)[2]	0.004	0.425	0.000	0.597	0.000	0.597
Serial correlation test: AR(1) (*p*-value)[3] AR(2) (*p*-value)	0.000 0.431	0.000 0.642	- -	0.000 0.607	- -	0.000 0.668
Wald test for joint significance (*p*-value)	0.000	0.000	0.000	0.000	0.000	0.000
No. of instruments	97	97	121	121	122	122
Cross-sectional observations	123	123	126	126	126	126

Note: ♣The regressions also include time trend variables for the different periods that are not reported.
[1]In the regression, this variable is included as log(variable).
[2]The null hypothesis is that model, and over-identifying conditions are correctly specified.
[3]The null hypothesis is that there is no serial correlation in the first-differenced disturbances.
Values in parenthesis are *t*-statistics.
***,**,* indicates significance at 1%,5% and 10% levels respectively.

Using the GMM estimator, which exploits the moment conditions, the coefficient on the lagged profit efficiency variable is higher than first-differenced GMM (0.4219) and statistically significant. These results address that the initial profit efficiency (L1) is significantly and positively related to the efficiency of the current year in both models. By including the efficiency of the previous year (L1) as an independent variable, we capture the dynamic nature of bank efficiency, which is significantly different from zero, indicating profit efficiency influenced by previous years' efficiency.

The results from the specification tests, i.e. Sargan test and AR(1) and AR(2) statistics, for the first-differenced and system GMM estimators confirm the overall validity of the instruments and thus the consistency of the GMM estimators. Results from the Sargan difference test justify the additional instruments and, thus, the advantage of the system-GMM estimator over the first-differenced GMM estimator. Comparing the first-differenced and system GMM estimator, we find a substantial improvement in the precision of the latter in terms of standard errors (see Blundell & Bond, 1998). The inference in this section, therefore, is based upon the system-GMM estimates. Like the cost efficiency model, the coefficients of all single monetary policy variables are significant, at least at 1%, which is in line with our expectations. Consequently, credit, interest, exchange rate, and price stability factors are essential in determining profit efficiency.

Concerning the credit channel and its correlation with bank profit efficiency, the *bank lending* variable has a positive sign, indicating higher domestic credit provided by the banking sector contributes to lower banking costs. Higher bank lending ability contributes to decreased banking costs, causing higher profit efficiency in the euro area banking sector. A plausible reason is the bank-lending channel (BLC) has focused on the possible effect of monetary policy actions on the supply of the loans by affecting the liability side of bank balance sheets. Therefore, an expansionary monetary policy increases reservable liabilities, which leads banks to increase lending due to the growth of funding sources. In other words, the significant and positive coefficient of bank lending variable justifies Single Monetary Policy influence on bank profit efficiency from bank lending channel linkage.

Concerning the *capitalisation* results, the empirical findings indicate that bank capital to total assets ratio to be negatively related to the cost efficiency of banks operating in the euro area banking sector. The results imply that the more capitalised banking system tends to exhibit a lower efficiency level, which indicates that a bank operating in a high capitalisation banking sector ratio (high capital adequacy ratio) cannot offer more output (loan and profit) improves cost-efficiency. A well-capitalised banking system is less prone to financial crises, whereas an inadequately capitalised system is more vulnerable. Inadequate capitalisation can thus have a systemic adverse effect on bank efficiency irrespective of whether or not an individual bank is adequately capitalised. However, the empirical evidence from some of the euro area countries is that multiple recapitalisations often strengthened rather than severed the ties between banks and weak state-owned enterprises (SOEs) to which they had large exposures (see Wachtel & Bonin, 2004). Government inability or unwillingness to deal with this problem created a moral hazard problem that adversely affected bank performance and, thus, efficiency

Likewise, the liquidity coefficient enters the regression models with a positive sign and is statistically significant at a 1% level in the GMM-SYS regression model. The result indicates that more liquidity in the banking sector trends to report higher bank efficiency. At this point, though, the increased cost for screening and mentoring by a higher share of loans in bank assets profile (instead of liquid assets) makes high operational costs in a bank portfolio. Therefore, this finding signals that sound banking characteristics in terms of liquidity play an important role in influencing

the banks' profit efficiency.

The impact of standing facility instruments of the Single Monetary Policy by ECB on bank efficiency is statistically significant in all cases. It can be observed from Table 6 that the *deposit facility* has a negative relationship with the Eurozone banks' efficiency, which could be due to the deposit facility normally providing a floor for the overnight market interest rate. Therefore, the bank costs may increase by borrowing from the overnight market when the deposit facility is, causing lower profit efficiency.

Similarly, a higher *marginal lending facility* has allowed overnight interest rates to increase up to this ceiling rate. As a consequence, the price of the loanable fund can increase for banks that want to lend to others. So, the relationship between the marginal lending facility and profit efficiency is straightforward: the increased marginal lending facility has enabled banks to become more efficient.

The third set of variables representing the reference exchange rate of the Eurozone consists of the following variable. The exchange rate level is positively related to the efficiency of the Eurozone banks, indicating, on average, a higher exchange rate (the increase of the national currency value) can be associated with the deteriorating profit efficiency of banks. In essence, the empirical findings suggest that in the case of the euro area banking system, the value of foreign assets, including loans, reserve and investment security, will be negatively affected by increasing the exchange rate. This indicates that as the exchange rate becomes more unstable, banks find it difficult to manage their loan profile. The core reason for this may be that the deteriorating exchange rate of the national currency may contribute to high costs for borrowers who may find it difficult to repay bank loans, resulting in loss of loan provision and non-performing loans. Furthermore, in international banking, most of the bank foreign exchange income results from the commissions and fees of foreign exchange operations, which could be decreased due to the high value of a national currency.

Turning to the impact of the Maastricht Protocol targeted policy, from Tables 5 and 6 we can observe that the coefficients of inflation and long-term interest rate targeting variables are negatively related to the bank efficiency level.

The results have stated that, on average, the increasing difference between the actual level of the average rate of inflation (HICP) and the unweighted arithmetic average of the rate of inflation in three best performing Member States in terms of price stability is associated with decreasing bank efficiency at the domestic country level. In addition, the difference between the actual level of average yields for 10-year government bonds and the unweighted arithmetic average of the long-term interest rates of the same three Member States was used to calculate the reference value for the criterion on price stability have a negative impact on bank efficiency. Those two variables related to sustainable convergence ensure that economic development within EMU is balanced and do not give rise to tensions between the EU Member States.

5. Conclusion

This paper proposes to estimate the efficiency of the Euro's banking system in maintaining an unbiased monetary policy with price stability, recognise bank structural problems and find ways to improve the performance of Eurozone banks through the further debt crisis and single supervisory mechanism (SSM).

The statistical testing results showed a significant relationship between a single monetary policy and the bank's efficiency in general. Specifically, on average higher bank lending, liquidity and deposit facility can be associated with improving profit efficiency of banks. In contrast,

capitalisation, exchange rate, inflation targeting, and long-term interest rate targeting variables had a negative effect on cost and profit efficiency levels. Overall, these measures of price stability and long-term interest rate targeting did significantly explain bank efficiency positively because achieving the best performing Member States in terms of price stability might affect the ability of the bank to perform better.

Finally, the empirical results indicate a large asymmetry between countries regarding their profit efficiency level. However, the evolution of profit efficiency in each country shows no clear trend in general. The efficiency scores have been decreasing from starting to ending years in most of the countries in the sample.

The policy implication arising from the analyses presented is that the European monetary authority has faced significant pressures of inflation targeting and long-term interest rate targeting policy on bank performance that negatively influence bank efficiency. Therefore, ECB should adjust and regulate new price stability and long-term interest rate policy to improve the efficiency of the banking sector can cause better banking performance, decrease costs, improve quality of services, and betterment the allocation of resources and increase the productivity of the entire economy.

A second policy implication is that bank regulators and management in Slovakia, Greece, and Portugal (as the most inefficient banks), under a market economy and facing a fiercely competitive banking market, should focus on improving management and innovating technology and enhance the quality of employees.

Our study contributes to the literature in several aspects. First, the literature is a treasure of country studies on efficiency in the banking industry. Studies on international comparison of efficiency are rare. Second, our study contributes to the literature by providing estimations of banks' cost and profit efficiency based on non-parametric frontier analysis for all the euro area member states; it also compares efficiencies scores derived from the Member States. Finally, the findings of the current study contributed to the body of knowledge. The empirical finding of studies about the track of bank efficiency from introducing the Euro indicates that the efficiency level differs over time and from one bank to another, one country to others.

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The Effect of Financial Literacy on Investors' Financial Risk Tolerance

Nasim Mohammadi, Afsaneh Soroushyar

Department of Accounting, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran

Abstract

This paper aims to examine the effect of financial literacy on investors' financial risk tolerance among investors of the Tehran Stock Exchange. The research sample selected by available methods includes 384 investors of the Tehran Stock Exchange in the first half of 2020. The standard questionnaire of financial literacy and financial risk tolerance of Yaghoubnejad et al. (2011) and Carina & Lisa (2015) has been used to measure the research variables and test hypotheses. The content and face validity methods and factor analysis were used to confirm the validity of the questionnaire, and its reliability was evaluated using Cronbach's alpha coefficient. Structural equation and PLS methods have been used to test the research hypotheses. The research hypotheses test results showed that earning money literacy, investment literacy, spending and borrowing literacy and financial risk literacy as components of financial literacy has a positive and significant effect on financial risk tolerance. But savings literacy does not affect financial risk tolerance.

Keywords

Financial Literacy, Financial Risk Tolerance, Investors

Corresponding author: Afsaneh Soroushyar
Email: *a_soroushyar@yahoo.com*

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1. Introduction

It is universally accepted that financial literacy is an essential component of financial and economic stability and development. There are several definitions of financial literacy; however, there is no agreement to these definitions. Each institution has designed financial literacy measuring tools according to its definition; for this reason, there have been many tools and methods in measuring financial literacy. These methods and tools vary differently from each other (Allgood & Walstad, 2011). Based on the definition of the Organization for Economic Development and Cooperation in 2013, “financial literacy is the ability to make informed judgments and make effective decisions about the use and management of money"(ASIC,2013). According to Jumpstart (2009), financial literacy is the ability of a person to use his/her knowledge and skills to effectively manage his/her financial resources for financial security throughout his/her lifetime. Therefore, one of the main issues in financial markets' efficient performance is current or potential participants (Karimkhani & Eslami, 2015).

Financial literacy and understanding its implications are particularly important to investors because financial decisions significantly impact their financial situation during their lifetime. Additionally, their financial situation in life can affect their overall performance (Shirazian, 2018). In recent years, developing and developed countries have been concerned about their citizens' level of financial literacy. Because it can not be ignored that the investors are often faced with difficult economic and financial contexts, financial decisions can have major negative consequences in risky financial situations (Gerardi et al., 2015). On the one hand, a person's background feelings or circumstances, such as their financial literacy, may influence financial decisions (Nofsinger, 2014). Investors with poor financial intelligence and poor financial management skills may avoid investing in risky and complex projects. On the other hand, those with the lowest risk tolerance levels may need more financial training (Gunderse & Garasky, 2012).

Risk tolerance has been regarded as the opposite of risk aversion. Risk tolerance is also expressed so that despite the uncertainty that people have in financial decisions, both in their economic and social life, they accept it and are willing to do it. Financial risk tolerance is a mental trait and a genetic predisposition (Huhmann and McQuitty, 2009). The literature shows that investors' individual characteristics will affect their perception of risk and risk-taking (Mayfield et al., 2008). Much of modern economic research has pointed out that the rational man is always trying to maximize wealth while at the same time considering minimizing risk (Barber & Odean, 2011). Managers' financial literacy can also be expected to affect financial risk tolerance (Carina and Lisa, 2015).

Lack of understanding of economics and finance is a deterrent to stock ownership (Rooij Lusardi and Alessie, 2011). A review of studies shows that various factors are involved in risk perception and investor decisions, including financial literacy (Agarwal et al., 2015; Almenberg & Dreber, 2015; Calcagno & Monticone, 2015; Sharma & Johri, 2014).

Ryack (2011) argues that the role of financial training and literacy about financial risk tolerance is a critical approach that has not received enough attention. However, some researchers have shown that financial literacy and higher education are associated with increased financial risk tolerance (Grable, 2000; Hallahan et al., 2004). Consequently, according to the principles presented on the subject of research, we can say that the primary purpose of this study is to investigate the effect of financial literacy on financial risk tolerance.

This study will continue as follows: first, the theoretical framework of financial literacy research on financial risk tolerance is defined. In the following, the research methodology, including research variables and patterns, are presented. In the final part, after stating the research results,

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conclusions and suggestions will be presented.

2. Literature Review and Background Review

Financial risk tolerance is necessary for building a portfolio and plays a vital role in financial decisions, such as job choice, insurance exemptions, mortgages, necessary budgets, and negotiations. Financial risk tolerance is, therefore, a relevant structure for understanding individuals' behaviours. As a result, a careful assessment of financial risk tolerance will be essential. Financial risk tolerance refers to investors' attitudes toward risk and returns on investment fluctuations that an investor is willing to accept to make his/her decision (Aqasi et al., 2016).

According to research by Adamola et al. (2019), it was indicated that there is a positive and significant relationship between financial knowledge, risk perception and investment decisions, while this positive relationship is not merely substantial between financial literacy and investment decisions. However, risk perception moderates the effect of financial literacy and investment knowledge on investment decisions. Nguyen et al. (2016) showed that risk tolerance would directly affect the allocation of high-risk assets and indirectly affect risk perception.

Hassanzadeh et al. (2019) showed that personal mindsets, accounting information, economic information and personal financial needs would influence investment decision-making in Iran, while there is no significant relationship between financial literacy level and investor decisions. In addition, the result shows that considering the level of understanding of investors' risk, their level of risk-taking will influence their investment decisions. Mir Mohammadi Sadrabadi and Shakerian (2018) showed that financial literacy, financial knowledge, and perceived risk significantly affect investment decision-making; perceived risk will negatively moderate the relationship between financial knowledge and investment decision, while it does not moderate the relationship between financial literacy and investment decision.

Therefore, today's financial market has a certain complexity and offers clients a wide range of items to meet their financial needs. The approach chosen to interact with these markets and their selections depends on their financial knowledge and skills to evaluate market options. Those unwilling to take risks and have no perception of them are less likely to participate in the stock market. This issue raises this effect on individuals to make desirable financial decisions to interact with these issues with a high level of awareness (Sabri, 2016).

Financial knowledge will allow individuals to have accurate information about financial management calculations, including rates, interest, inflation and principles related to risk diversification, because of the capabilities it creates in the individual; accordingly, one can make more effective decisions in facing situations that require financial choices. Without understanding how users perceive risk financial statements, it will be difficult for individuals to manage and evaluate risk-related ventures. For this reason, those who perform accurate management and evaluation based on their knowledge of financial reporting use findings related to financial risk judgments to make more effective decisions.

The type of approach people take to risk, and their priority to its types can effectively predict their future behaviours. Therefore, recognizing the impact of financial literacy on financial risk tolerance is of great importance, which is also studied in this research.

3. Research Hypotheses

According to the theoretical foundations, the research hypotheses are expressed as follows:

H1: Earning revenue literacy has a positive and significant effect on financial risk tolerance.

H2: Savings literacy has a positive and significant effect on financial risk tolerance.

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H3: Investment literacy has a positive and significant effect on financial risk tolerance.

H4 Spending and borrowing literacy have a positive and significant effect on financial risk tolerance.

H5: Financial risk literacy has a positive and significant effect on financial risk tolerance.

4. Research Methodology

This is a descriptive study; data were collected using a survey method. In this research, we have used the standard questionnaire of Yaghoubnejad (2011) with 25 questions for financial literacy and 18 questions for financial risk tolerance to analyze the variables of financial literacy and financial risk tolerance which is as follows.

Table 1. The Cronbach's alpha coefficient of the questionnaire

Variable	Cronbach's alpha
Financial risk literacy	0.73
Risk tolerance	0.75

The statistical population includes all investors of the Tehran Stock Exchange. Due to the unlimited population and according to the Morgan table, the sample consists of 384 people. Sampling was done by the available method. The collected data were analyzed at two levels of descriptive and inferential statistics.

The descriptive statistics section examined each variable's mean, median, standard deviation, and minimum and maximum indices. In the inferential statistics section, structural equation modelling using the partial least squares (PLS) method is used to test the hypotheses.

5. Research Findings

The results of descriptive statistics of research variables are as described in Table 2.

Table 2. Descriptive statistics

	Mean	Med	Std.dev	Min	Max
Earning Literacy	3.410	3.600	0.696	1.800	4800
Savings Literacy	3.369	3.600	0.717	1.400	4.600
Investment literacy	3.777	3.800	0.601	2.200	5.000
Spending and Borrowing Literacy	3.522	3.600	0.616	2.200	2.000
Financial Risk Literacy	3.283	3.400	0.749	1.000	5.000
Financial Risk Tolerance	3.168	3.388	0.700	1.500	4.500

The results of demographic statistics of the research are described in Table 3.

The ability to measure research variables is assessed according to the questionnaire's questions before testing the main model and research hypotheses using the second-order confirmatory factor analysis method.

Figure 1 shows the model of impact coefficients regarding the factor load after removing the coefficients with a low factor load.

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Table 3. The demographic statistics of the research

Gender	Frequency	Frequency Percentage	Education	Frequency	Frequency Percentage
Female	159	42	Diploma and lower	58	15
Man	225	58	Associate	32	8
			Bachelor	160	42
			Masters	122	32
			P.H.D	12	3
Total	384	100	Total	384	100
Work experience	**Frequency**	**Frequency Percentage**	**Age**	**Frequency**	**Frequency Percentage**
Less than 5 years	242	63	Younger than 30 years	128	33
5 to 10 years	72	19	30 to 40 years	176	46
10 to 15 years	30	8	40 to 50 years	54	14
More than 15 years	40	10	Older than 50 years	26	7
Total	384	100	Total	384	100

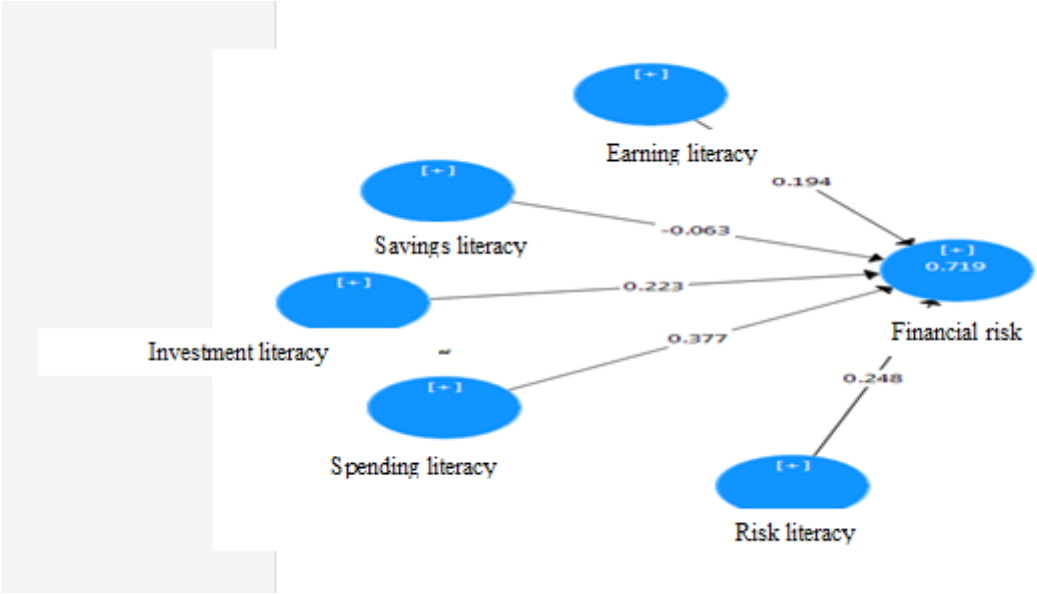

Figure 1: The model of impact coefficients regarding factor load

To test the research hypotheses, we have used PLS; the results of each hypothesis are as follows:

The test results of the first hypothesis of the research based on the positive effect of revenue earning literacy on financial risk tolerance are described in Table 4.

Table 4. Estimation of the coefficients of the first hypothesis

Relationship between variables	Impact coefficient	t-statistic	Sig.
Earning literacy ← Financial risk tolerance	0.194	2.549	0.011

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In 95% confidence level, given the significance level is equal to 0.011 and less than 0.05, it can be said that revenue earning literacy has a significant effect on financial risk tolerance. Also, considering that the coefficient of the impact of revenue earning literacy on financial risk tolerance is positive and equal to 0.194, it is concluded that revenue earning literacy has a positive and significant effect on financial risk tolerance. As a result, the first hypothesis is confirmed.

The results of testing the second hypothesis of the research based on the positive effect of savings literacy on financial risk tolerance are described in Table 5.

Table 5. Estimation of the coefficients of the second hypothesis

Relationship between variables	Impact coefficient	t-statistic	Sig.
Savings literacy ← Financial risk tolerance	-0.063	0.593	0.553

As shown in Table 5, the significance level is more than 0.05, and it can be said that savings literacy has no significant effect on financial risk tolerance. As a result, the second hypothesis of the research is not confirmed.

The results of testing the third research hypothesis on the positive effect of investment literacy on financial risk tolerance are presented in Table 6.

Table 6. Estimation of the coefficients of the third hypothesis

Relationship between variables	Impact coefficient	t-statistic	Sig.
Investment literacy ← Financial risk tolerance	0.223	1.992	0.047

In the above table, the significance level is equal to 0.047 at the confidence level of 95%, and because it is less than 0.05, then investment literacy has a significant effect on financial risk tolerance. Also, considering that the impact factor of investment literacy on financial risk tolerance is positive and equal to 0.223, it can be seen that it has a positive and significant effect on financial risk tolerance. Accordingly, the third hypothesis of the research is confirmed.

The results of testing the fourth hypothesis of the research based on the positive effect of spending and borrowing literacy on financial risk tolerance are described in Table 7.

Table 7. Estimation of the coefficients of the fourth hypothesis

Relationship between variables	Impact coefficient	t-statistic	Sig.
Spending and borrowing literacy ← Financial risk tolerance	0.377	3.473	0.001

Based on the above table results, since the significance level is 0.001 and less than 0.05, it can be said that spending and borrowing literacy has a significant effect on financial risk tolerance. Also, considering that the coefficient of the effect of spending and borrowing literacy on financial risk tolerance is positive and equal to 0.377, it can be argued that spending and borrowing literacy has a positive and significant effect on financial risk tolerance. As a result, the fourth hypothesis of the research is confirmed.

The results of testing the fifth research hypothesis on the positive effect of financial risk literacy on financial risk tolerance are described in Table 8.

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Table 8: Estimation of the coefficients of the fifth hypothesis

Relationship between variables		Impact coefficient	t-statistic	Sig.
Financial risk literacy	← Financial risk tolerance	0.248	2.260	0.025

At the confidence level of 95%, because the significance level is less than 0.05, it can be said that financial risk literacy has a significant effect on financial risk tolerance. Also, considering that the coefficient of the impact of financial risk literacy on financial risk tolerance is positive and equal to 0.248, it is concluded that financial risk literacy has a positive and significant effect on financial risk tolerance. As a result, the fifth hypothesis of the research is confirmed.

6. Discussion and Conclusion

This research aimed to investigate the impact of financial literacy on investors' financial risk tolerance among the investors of the Tehran Stock Exchange. Testing the first hypothesis showed that earning literacy has a positive and significant effect on financial risk tolerance. Accordingly, it appears that having literacy-related skills will enable people to make informed decisions about their financial capital and will minimize the likelihood of any financial mismanagement and also the associated negative consequences, and it can also be effective in predicting their future behaviours. The results of testing the second hypothesis showed that savings literacy had not affected financial risk tolerance. These findings are inconsistence with the research of Zakaria et al. (2017); because they showed that savings financial literacy had a positive effect on risk tolerance and can predict the type of approach a person makes when deciding to invest or save; but they had no connection or influence on each other in this research. The results of testing the third hypothesis showed that investment literacy has a positive and significant effect on financial risk tolerance. Some studies have been done with these results and showed that investment had become a dynamic and challenging field today. Testing the fourth hypothesis showed that spending and borrowing literacy positively and significantly affect financial risk tolerance. Some studies, in this regard, have been done and showed that the company's capital expenditures are the rate of return expected by investors; therefore, when investors invest in a company, they seek to increase their achievable profit. This is an important part that managers consider that financial risk affects the rate of return expected by investors. Finally, the results of testing the fifth hypothesis showed that financial risk literacy has a positive and significant effect on financial risk tolerance. Studies have shown that understanding the risk can express perceived damage from the future to these results. Still, there is always the possibility that an event is associated with the amount of losses and requires it in a way. Hence, investors are advised to pay attention to earning literacy because literacy-related skills enable individuals to make informed decisions about their financial capital. The likelihood of any financial mismanagement and its associated negative consequences will be minimized. Additionally, earning literacy, because of the capabilities it creates in the individual, allows him/her to have accurate information about financial management calculations and principles related to risk diversification and accordingly, he/she can make more effective decisions in the face of situations that require financial choices. If individuals are intended to invest in the stock market, they are advised to increase their investment literacy and use the opinion of expert consultants in this work. Those with more information in the areas of literacy and financial borrowing are advised to be careful enough when practically using this information and always remember that practising a field is very different from knowing it; and they are advised not to over-rely on their theoretical literacy in markets such as the Iranian capital market, which has a relatively high unsystematic risk, and to

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be careful to use their information at the right time and in relevant issues—making the help of psychological counselling and experienced people in the field of capital markets can play a very effective role in this regard. Unfortunately, in our country, there is no positive attitude about this. Perhaps it is one of the reasons for the differences in the results of this research with other countries. A separate study should be conducted to make detailed remarks in this regard.

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The Relationship between Human Resource Investment Inefficiency and Tax Avoidance: Evidence from Tehran Stock Exchange

Mahmoud Mousavi Shiri

Department of Management, Economics and Accounting, Payame Noor University, Tehran, Iran

Faezeh Rafiee

Department of Accounting, Islamic Azad University, Mashhad, Iran

Ehsan Ghadrdan

Department of Accounting, Technical and Vocational University(TVU), Tehran, Iran

Abstract

Human resource is one of the most critical resources of any organisation that can play an influential role in different functional departments of companies. One of these practices is tax avoidance, which may occur due to the company's poor economic condition. In this study, we intend to investigate the relationship between the inefficiency of investment in human resources and tax avoidance in companies in Iran as a developing country. The research method used among the companies listed on the Tehran Stock Exchange is quasi-experimental with a post-event design. A sample consisting of 108 companies from 2013-2020 was examined using multivariate regression and panel data. The results of examining and analysing the hypotheses showed that over-investment and under-investment in human resource has a positive and significant effect on corporate tax avoidance. It seems that over-investment in human resources leads to an increase in administrative and sales costs (agency costs), and under-investment in human resources leads to a decrease in productivity. Companies tend to pursue policies to survive in competition with other companies, and corporate executives pursue tax avoidance as a helpful solution in this regard.

Keywords

Over-investment in Human Resource, Under-investment in Human Resource, Tax Avoidance, Corporate Executives

Corresponding author: Mahmoud Mousavi Shiri
Email: *Email:mousavi1973@pnu.ac.ir*

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1. Introduction

From an income point of view, taxation is the most important tool for distributing government revenue. Undoubtedly, it is one of the most important fields of economics that tests positive economic theories. Tax theories are the most important economic tools for government policymaking. Theorists especially consider these tools due to their leading and definite position in providing the necessary resources to perform duties in government, economic, welfare, etc. In developed countries, taxes are strong leverage for implementing fiscal, economic policies, social activities and government funding. In these countries, tax revenues are at the top of the government's general revenues. As a result, tax evasion has several potential consequences. Therefore, by identifying the factors affecting tax avoidance, this can be prevented to a large extent.

Investment efficiency is achieved when the company only invests in projects with a positive net present value to increase shareholders' wealth. Therefore, it is possible to expect that the amount of investment of the company is affected by the amount of available funds and not by the projects with a positive net present value is probable only in conditions of weak corporate governance or the existence of agency problems that limit the manager's access to external resources. (Bhabra,Kaur and Seoungpil, 2018). In recent years, the management of organisations has recognised that human capital and effective investment are of great importance in achieving a sustainable and effective competitive advantage (Hendricks,2002). The concept of human capital is rooted in economic literature. This concept became important in business level analysis when companies could no longer gain a sustainable competitive advantage with their physical and tangible assets and competed with each other on their intangible assets (Becker,1964). It can be said that the efficiency of human resources in a company is a reflection of extensive organisational capabilities, availability of resources and return on investment. Indeed, manpower productivity is crucial to a company's success (Taylor et al.,2019). In contrast, research in accounting and economics suggests that the inefficiency of investment in the company's human resources indicates a significant increase in the company's production costs, resulting in deficiencies in financing and investment activities. Human resource inefficiency reflects contracting and control conditions that include agency costs, supervision, transparency, and information exchange (Pinnuck & Lillis, 2007; Jung, Lee and Weber, 2014).

Considering that research conducted outside of Iran is also related to countries with complex and advanced economies, and in developing countries, there is no significant research in this field; it is obvious that the results observed in the business environment of developed countries, due to the different essential elements such as market environment and the agency problems, cannot be generalised to countries like Iran. Therefore, it is necessary to conduct research that examines the impact of the inefficiency of investment in human resources on tax avoidance in developing countries such as Iran. Examining this issue can lead to a review or extension of previous studies on tax avoidance results. This study provides an essential perspective for taxpayers (e.g., Internal Revenue Service (IRS)) and policymakers seeking to identify situations in which corporate tax avoidance is greater. It also enhances our understanding of the relationship between investment efficiency and tax avoidance, likely to impact financial reporting quality, profitability, and firm value.

2. Literature Review and Hypothesis Development

2.1. Tax Avoidance

The existence of income tax reduces the income of the business unit. One of the basic measures

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to maximise the value of the company and shareholders' wealth and increase investment efficiency is to reduce taxes. In the financial literature, companies' legal efforts to minimise tax costs are known as tax management, tax avoidance, and bold tax planning (Desai, Dharmapala and Fung, 2005). Tax avoidance means trying to reduce taxes paid. Tax avoidance is a kind of use of legal loopholes in tax laws to reduce taxes (Hanlon & Shane, 2010). Tax avoidance is a tax-evasion activity without breaking the lines of law and is within the framework of tax law (Agrawal, 2007). Tax avoidance, as a way to reduce the amount of tax on the earning from the performance of business units, creates chains of activities and strategic plans which are entirely legal and progressive in obtaining tax exemptions, which leads to a grey area in the presentation of financial and tax information and reports to the outside of the organisation, and this is becoming a significant concern for governments. Tax avoidance increases available funds. This can create wealth for shareholders or exacerbate agency problems (Hanlon & Shane, 2010).In the traditional view, tax avoidance reduces the transfer of wealth to the government and enables the company to gain more profits and increase stock value (Wilson, 2009). In other words, tax policies are similar to investment decisions that create economic resources for the company through tax avoidance (Francis, Sun, and Wu, 2013). Research on tax avoidance also suggests that funds from tax evasion activities can be used for investment and production. This will increase the expected cash flow in the future and thus reduce the capital cost. In addition, factors such as the level of external oversight and growth opportunities in companies avoiding tax are likely to affect the severity and weakness of capital cost reductions.

2. 2. Inefficiency of Investment and Tax Avoidance

In today's business and economic environment, effective investment can lead to sustainable economic growth and development. Managers with an optimal level of investment can take advantage of profitable opportunities to maximise returns and meet the interests of shareholders. Investment has always been considered one of the main ways to develop companies and prevent recession and backwardness. Meanwhile, resource constraints and the amount of investment caused investment efficiency to be also critical. According to Hubbard (1998), there are at least two theoretical criteria for determining investment efficiency. First, a company needs to raise resources to finance investment opportunities. In fact, in an efficient market, all projects with a positive net present value should be financed. However, most parts of the existing literature in finance have shown that financial constraints limit the ability of managers to finance. Second, if a company decides to finance, there will be no guarantee that it will be invested properly. For example, managers may invest inefficiently by choosing unsuitable projects for their benefit or abusing existing resources. Most articles in this field predict that the selection of poor projects leads to overinvestment (Stein, 2002). It can be said that the amount of investment is determined according to the priority for growth or financial security. In the agency theory framework that companies face information asymmetry problems, managers may deviate from the desired level of their investment and, consequently, suffer from underinvestment or overinvestment. Market failures, along with information asymmetry and agency costs, can lead to projects with negative net present value (overinvestment) and rejection of projects with positive net present value (underinvestment); this means inefficiency in investment (Core et al., 2006; Biddle, Hilary and Verdi, 2009).

Over the past two decades, the business environment in which companies compete has changed dramatically. Today, many influential companies derive their competitive advantage from sources different from traditional sources of wealth creation (Bartlett & Ghoshal, 2002). During the

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Industrial Revolution, companies relied on physical assets such as land, natural resources, buildings, and machinery to create wealth. Still, the emergence of knowledge-based organisations and industries (such as Microsoft and .com companies) has dramatically changed the nature of wealth creation (Stewart, 2004). These companies have created value and the market not because of their physical assets but their intangible assets. Managers today experience an era in which the real capital of organisations is human capital (Barney & Wright, 1998). Therefore, in the present era, knowledge of human resources is considered the most important capability of the organisation in gaining a competitive advantage and is also the main intangible asset. Organisations believe that employees should be considered the basis for improving the quality and efficiency of all organisational processes. Therefore, this factor should be considered the main basis for increasing efficiency and effectiveness and the most valuable capital, the golden key of competition (Ellinger et al., 2002). Therefore, today, organisations place more emphasis on investment in human capital because this investment and improving the quality of labour is one of the main and fundamental areas and ways to improve productivity and accelerate the growth and development of organisations and leading organisations try to attract, nurture, retain, and employ talented and knowledge worker to ensure their competitive advantage today and tomorrow (Baron & Dreps, 2002). It can also be stated that information asymmetry between managers and investors and the existence of conflicts of interest between the two groups may involve managers in ethical risks and lead to overuse of manpower or maintenance of unnecessary manpower in the company (overinvestment in human resources) (Gomariz & Ballesta, 2013). In addition, information asymmetry can lead to the phenomenon of incorrect selection. In this situation, investors who have less information than managers keep themselves safe from the risk of information asymmetry by reducing stock bid prices. This makes it difficult for companies to finance profitable projects and leave too much labour (underinvestment in manpower) to reduce costs (Jung, Lee and Weber, 2014). As a result, an environment associated with market sensitivity, information asymmetry, and human resource investment inefficiencies (overinvestment and underinvestment) may contribute to managerial economic rent, as company managers are allowed to consider their personal interests when doing corporate affairs. Human resources inefficiency is likely to facilitate long-term management of economic rent and bad news hoarding by providing a mask and justifying opportunistic behaviours. Hiding bad news about the consequences of manpower inefficiencies may be caused by compensation contracts and job worries, which can facilitate managerial opportunism, motivate them, and avoid tax. Gathering negative news about human resource inefficiency over a long period can prevent remedial management action and question management strategies from improving operational productivity (Taylor et al., 2019). Manpower inefficiency includes reduced transparency and information exchange. In practice, human resource inefficiencies are prone to information asymmetries or agency problems that lead to increased moral risk or undesirable choices. Underinvestment in manpower through information asymmetry between firm managers and investors may manifest in reduced or increased employment, leading to operational inefficiencies in companies' cash flow (Jung, Lee and Weber, 2014). For example, a conservative approach to hiring and firing may, in turn, limit the profitability of a company's operations and motivate managers to pursue tax evasion activities to increase cash flow. In particular, inefficiency at work may affect the company's ability to monitor and control adequately. On the other hand, human resource inefficiency leads to declining profitability, which may affect the ability of companies to continue operating (Cameron, 1994). This is because, unlike capital, manpower is used primarily for the company's operating cash flow and not for debtor financing.If inefficient manpower employment reduces companies' profits and domestic revenues so that companies cannot meet their current

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needs and costs (i.e., pay wages, profits and taxes), their incentive to save money, including tax avoidance, will increase. Also, the inefficiency of manpower investment can lead to corporate capital budgeting because foreign investors (who have less information than corporate executives) spend more capital costs(Jung, Lee and Weber, 2014). The reason for this is that the human resource market's efficiency can affect the capital supplier's ability to understand the company's financial statements, interpretation of resources and profit retention, cash flow, and its risk. Increasing the cost of external financing makes companies more confident in the domestic budget for their financing and investments. Manpower inefficiency is likely to affect operating cash flow and thus tax avoidance (Taylor et al., 2019).

Asiri et al. (2020) identified a positive and significant relationship between investment inefficiency and tax avoidance. In their studies, Taylor et al. (2019) showed that the inefficiency of investment in manpower is significantly and directly related to tax avoidance. In particular, they concluded that in one case of standard deviation, the inefficiency of investment in manpower had led to a significant tax reduction of 0.71%. Khurana, Moser and Raman (2018) examined managerial ability, tax avoidance, and investment efficiency. The results showed that managerial capacity makes increasing tax avoidance lead to increased investment efficiency. Bailing & Rui (2018) examined the effect of tax avoidance on investment efficiency. The results showed that by increasing tax evasion in the company, overinvestment also increases. Nguyen et al. (2021) show that tax avoidance has a negative impact on the value of businesses. Cook et al. (2017) examined the linear relationship between capital cost and tax avoidance. They found that this relationship at higher levels avoids positive tax payment, which increases uncertainty with tax savings. Comprix et al. (2016), following a study entitled tax avoidance and investment behaviour, considering the role of environmental information, found a significant relationship between tax avoidance and the level of investment and overinvestment. Mohammed et al. (2013) concluded that developed and value-creating manpower is one of the organisations' most critical competitive advantages. The successful performance of organisations depends on value-creating manpower. Organisations must pay special attention to investing and developing their human resources to remain in the global competition. Gomariz & Ballesta (2013) showed that higher quality financial reporting leads to better accountability of managers and more supervision over them and reduces information asymmetry, incorrect selection, and ethical risks, which removes under overinvestment. In their research, Hanlon & Shane (2010) point out that tax avoidance is likely to be explained by several factors and their mutual impacts. They state that the company's strategy, which reflects its overall vision, can be one factor that determines tax avoidance.García-Meca, Ramón-Llorens and Martínez-Ferrero, (2021) show that Narcissism as a personality trait can cause CEOs to implement tax avoidance strategies. Mocanu, Constantin and Răilean (2021) Show that larger companies with lower financial performance and lower leverage ratios are more inclined towards tax avoidance.

According to the above, a significant relationship can be imagined between the amount of investment in human resources and tax avoidance. Therefore, to examine this relationship more accurately and test the validity of this relationship, the research hypotheses are presented as follows:

H1: Overinvestment in human resources affects tax avoidance.

H2: Underinvestment in human resources affects tax avoidance.

3. Research Methodology

3.1. Statistical Sample and Population

We obtain our required data manually from the hardcopy financial statements held in the TSE

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library (Codal[1] and its supplementary software known as Rahavard Novin) for 2013–2020. Table 1 shows the breakdown of the sample selection of the study.

Table 1. The sample of the study

The total firm listed on the Tehran Stock Exchange in 2020	516
Less: Delisted Firms	(113)
Less: Financial year was not at the end of March 20 and changed the end of the financial year	(112)
Less: companies should be affiliated with banks, investment companies and financial intermediaries because the type of activity and the financial structure of such companies are different from those of the sample	(61)
Less: Newly-listed Firms	(122)
Equal: Total Firms in sample	108

3.2. Regression Models

We empirically examine the relationship between inefficiency of investment in human resources and corporate tax avoidance based on models (1) and (2); we will introduce its variables in the following:

$$TaxAvo_{it} = \alpha + \beta_1 NETHIREOV_{it} + \beta_2 SIZE_{it} + \beta_3 lev_{it} + \beta_4 MTB_{it} + \beta_5 CASH_{it} + \beta_6 ROA_{it} + \beta_7 NOL_{it} + \beta_8 CAP_{it} + \beta_9 SALE_{it} + \varepsilon \quad (1)$$

$$TaxAvo_{it} = \alpha + \beta_1 NETHIREUN_{it} + \beta_2 SIZE_{it} + \beta_3 lev_{it} + \beta_4 MTB_{it} + \beta_5 CASH_{it} + \beta_6 ROA_{it} + \beta_7 NOL_{it} + \beta_8 CAP_{it} + \beta_9 GSALE_{it} + \varepsilon \quad (2)$$

3.3. Research Variables

3.3.1. Dependent Variable

The inefficiency of investment in human resources: In the first stage, the Pinnuck and Lillis (2007) model, which expresses the factors affecting investment in human resources, is estimated. This model shows the ability and limitation of the company's management in investing in human resources in financial periods. Therefore, the output of model waste is the same as abnormal investment in human resources. As a result, model (3) is as follows:

$$nethire_{i,t} = \beta_0 + \beta_1 gsale_{i,t} + \beta_2 gsale_{i,t-1} + \beta_3 \Delta roa_{i,t-1} + \beta_4 \Delta roa_{i,t} + \beta_5 roa_{i,t} + \beta_6 ret_{i,t} + \beta_7 size_{i,t-1} + \beta_7 quick_{i,t-1} + \beta_7 \Delta quick_{i,t-1} + \beta_7 \Delta quick_{i,t} + \beta_7 lev_{i,t} + \beta_7 loss1_{i,t-1} + \beta_7 loss2_{i,t-1} + \beta_7 loss3_{i,t-1} + \beta_7 loss4_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

In the above model, we have:

$nethire_{i,t}$: Manpower changes between the year's t and t-1 divided by year t-1;

$size_{i,t-1}$:The size of the company in the previous year, which is obtained from the natural logarithm of the book value of the company's assets; $GSALE_{it}$: Sales growth rate, calculated from the difference between sales between financial period t and t-1 divided by sales in period t-1;

[1] www.codal.ir

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$ROA_{i,t}$: Return on assets obtained from the distribution of net profit after deducting period tax on the book value of all assets; $lev_{i,t-1}$: the leverage of the company in the previous year, which is obtained by dividing the total debt into total assets; $ret_{i,t}$: stock return, which is the return on investment in stocks; $quick_{i,t}$: the quick ratio obtained from the ratio of cash and short-term investment divided by current debt; $loss1_{i,t-1}$: the decline in the profit of a period that if the company's profit for a period is reduced compared to that in the previous period, the variable=one and zero otherwise; $loss2_{i,t-1}$: decrease of profit for two periods, if the company's profit is decreasing for two periods, the variable=one and zero otherwise; $loss3_{i,t-1}$: decrease of profit for three periods, if the company's profit is decreasing for three periods, the variable=one and zero otherwise; $loss4_{i,t-1}$: Profit decline for four periods; if the company's profit is declining for four periods, the variable=one and zero otherwise. Also, in this model, $\varepsilon_{i,t}$represents the part of investment in human resources that could not be predicted according to the conditions and limitations of the company, which itself is divided into two parts, positive and negative.$NETHIREOV_{it}$is the positive part indicates overinvestment, and $NETHIREUN_{it}$ is the negative part indicates underinvestment. Sample data with positive values are used in Model (1), and sample data with negative values are used in Model (2).

3.3.2. Independent Variable

$TaxAvo_{it}$: Tax avoidance, which is calculated according to model (4):

$$TaxAvo_{it} = \frac{(taxinc_{it} - accinc_{it})}{taxinc_{it}} \quad (4)$$

In the above relationship:
$accinc_{it}$: Taxable income declared by the corporation at the end of the fiscal year;
$taxinc_{it}$: Definite taxable income of the corporation at the end of the fiscal year.

3.3.3. Control Variables

$size_{it}$: The size of the company that is obtained from the natural logarithm of the book value of assets; lev_{it}: The financial leverage that results from the ratio of total liabilities to the book value of assets; MTB_{it}: Market value to equity book, which is the ratio of the market value of equity (stock price in the number of shares issued at the end of the fiscal year) to the book value of equity; $CASH_{it}$: Cash and short-term investment divided by the book value of assets; ROA_{it}: Profitability obtained from the ratio of net profit divided by the book value of assets; $GSALE_{it}$: Sales growth rate, which is the difference in sales between financial period t and t-1 divided by sales in period t-1; NOL_{it}: Profit decline that if the company's profit is lower than that in the previous period, the variable= one, and zero otherwise; CAP_{it}: Fix asset ratio divided by the book value of assets.

4. Research Results

4.1. Descriptive statistics of observations:

In order to study the general and essential characteristics of variables to estimate the model,

analyse them accurately and understand the statistical population under study, it is necessary to be familiar with descriptive statistics related to variables.

Table 2. Descriptive statistics

Variables	Mean	Median	Max	Min	deviation	No.
Tax avoidance	0.570	0.547	1.000	0.000	0.365	864
Over-investment in human resource	0.032	0.001	0.796	0.000	0.070	864
Under-investment in human resource	-0.034	-0.034	-0.001	-0.874	0.089	864
Firm size	14.123	14.084	19.313	10.166	1.482	864
Financial leverage	0.593	0.606	0.997	0.061	0.194	864
Market value to the book value of the equity	5.440	2.986	235.078	0.050	12.256	864
Cash	0.060	0.031	0.694	0.000	0.081	864
Profitability	0.107	0.083	0.621	-0.493	0.138	864
Sales growth rate	0.260	0.177	6.555	-0.826	0.591	864
Profit decline	0.405	0.000	1.000	0.000	0.491	864

Table 2 shows that the tax avoidance variable had a mean of 57%, which means that there was tax avoidance in the companies surveyed on average, equal to 57% of the profit before tax. The financial leverage variable has a mean of 59%, i.e. averages of 59% of the total assets of the companies under investigation are financed by the company's debts. Also, the cash variable had a mean of 6%, and on average, the amount of cash and short-term investment was about 6% of the book value of assets in the surveyed companies. The study of profitability variable shows that on average, companies' net profit was about 10% of the book value of assets of the considered companies. The sales growth rate variable also has an average of 26%, which means that, on average, the companies' sales in each year compared to that in the previous year have grown by 26%. The profit decline variable also showed that the profit of 40% of the surveyed companies had a downward trend and was declining.

4.2. Specification Tests (Diagnostics) in Panel Data Models

We perform several diagnostic tests using the R programming language to estimate the most appropriate models. The following is a brief description of these tests at the significance level of 0.05:

One of the necessary conditions for using regression analysis in testing research hypotheses is the normality of the distribution of dependent variables. In this research, Jarque-Bera statistic has been used to test the distribution of research variables and the normality of the distribution of dependent variables. Considering that the significance level of the statistic for the above test is higher than 0.05, as a result, the hypothesis that the distribution of the dependent variable (tax avoidance) is normal is accepted at the 95% confidence level. Also, the results of the F-Limer test show that the test statistic for both models (1) and (2) is less than 0.05. Thus the priority of the panel data model is confirmed for both research models. The results of the Hausman test also show that we use both models using the fixed effects model. One of the hypotheses of linear regression by

ordinary least squares (OLS) method is that all residuals have equal variance. To test the hypothesis of variance heterogeneity in this study, the White test was used. Given that the calculated probability statistic is less than 0.05, the H0 hypothesis of this test that the variances are homogeneous is rejected, which indicates variance heterogeneity and the method of estimating our models will be according to the generalised least squares regression. A summary of the mentioned experiments is shown in Table 3.

Table 3. The summary of specification tests in panel data models

Result	P-Value	Statistics value	Model	Specification test
Normality of the dependent variable	0.088	1.627	-	J-arque-Bera
Appropriateness of the panel method	0.000 0.000	8.244 8.083	First Second	F-limer
Acceptance of fixed effects	0.035 0.000	16.569 19.505	First Second	Hausman
Variance heterogeneity	0.000 0.000	194.852 199.914	First Second	LR

4.3. Hypotheses Testing

The results of the analysis of models (1) and (2) of our research are given in Tables 4 and 5.

Table 4. Results of data analysis to test the first hypothesis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.300	0.071	4.243	0.000
NETOV	0.017	0.004	3.889	0.000
SIZE	0.021	0.021	1.000	0.318
LEV	0.050	0.021	2.446	0.015
MTB	3.271	9.611	0.347	0.734
CASH	0.002	0.0210	0.065	0.948
ROA	-0.069	0.014	-5.138	0.000
GSALE	-0.002	0.004	-0.553	0.581
NOL	0.001	0.004	0.306	0.760
Mean dependent var.	1.402		R-squared	0.770
S.D. dependent var.	2.502		Adjusted R-squared	0.765
Sum squared resid	41.110		S.E. of regression	0.241
Durbin-Watson stat	1.762		F-statistic	195.763
			Prob(F-statistic)	0.000

The overall coefficient is larger than the critical statistic, and its significance level is less than 5%, indicating a linear relationship between independent and dependent variables and regression has the necessary statistical validity. Also, in Table IV, it can be seen that the probability value for the variable of overinvestment in human resources is 0.0001, and the sign of the estimated coefficient for the mentioned variable is positive. Since the value of probability is less than 5%, it can be said that there is a positive and significant relationship between overinvestment in human

resources and tax avoidance. Therefore, the first hypothesis of the research is confirmed. The adjusted coefficient of determination equals 76% and indicates that independent and control variables explain 76% of the dependent variable changes. Also, the Durbin-Watson statistic is equal to 1.7620. Since these statistics are in the range of 1.5 to 2.5, it can be stated that the absence of correlation between the residues is accepted in the research model. According to the operational process of the model estimation, this serial autocorrelation has been eliminated.

Table 5. Results of data analysis to test the second hypothesis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.384	0.085	4.506	0.000
ABNETHIE	0.036	0.015	2.45	0.015
SIZE	0.012	0.005	2.373	0.018
LEV	0.038	0.024	1.576	0.115
MTB	4.071	8.631	0.471	0.638
CASH	-0.026	0.023	-1.112	0.267
ROA	-0.046	0.013	-3.475	0.001
GSALE	-0.005	0.004	-1.319	0.188
NOL	0.003	0.004	0.832	0.401
Mean dependent var.	1.361		R-squared	0.764
S.D. dependent var.	2.343		Adjusted R-squared	0.758
Sum squared resid	40.500		S.E. of regression	0.240
Durbin-Watson stat	1.678		F-statistic	162.688
			Prob(F-statistic)	0.000

Table 5 shows that the probability value for underinvestment in the human resource variable is 0.046, and the sign of the coefficient of estimation for the mentioned variable is positive. Since the probability value is less than 5%, it can be said that there is a positive and significant relationship between the variable of underinvestment in human resources and tax avoidance. As a result, the second hypothesis of our research is confirmed at a 95% confidence level. The adjusted coefficient of determination equals 75% and indicates that independent and control variables explain 75% of the dependent variable changes. The overall coefficient (F) is larger than the critical statistic. Its significance level is less than 5%, indicating a linear relationship between independent and dependent variables, and regression has the necessary statistical validity. Also, the Durbin-Watson statistic is equal to 1.6779. Since these statistics are in the range of 1.5 to 2.5, it can be stated that the absence of correlation between the residues is accepted in the research model. According to the operational process of the model estimation, this serial autocorrelation has been eliminated.

5. Conclusion

Taxes are one of the most important sources of government revenue, which in addition to providing the financial resources that the government needs, help to distribute income and wealth better. The composition of tax revenues and the share of taxes from the total public revenues differ from one country to another due to economic, cultural, and historical conditions. Tax avoidance and evasion make countries' tax revenues always lower than estimated; therefore, this issue and the factors affecting it and its results are considered issues and concerns in society. On the other hand, human resources as a source of capital have been evaluated by managers of all economic units and

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social institutions. They improve their performance levels and increase their efficiency. As a result, in this study, we sought to investigate the relationship between the inefficiency of investment in human resources and tax avoidance in Iranian companies.

The analysis of the first hypothesis showed that overinvestment in human resources has a positive and significant effect on tax avoidance among Iranian companies in the period under study. Overinvestment in human resources leads to information asymmetry, increases administrative and sales costs (agency costs) and reduces companies' profits and their internal revenue, so that companies cannot meet their current needs and costs (i.e., payment of wages, profits, and taxes), thus their incentive to save money, which may include tax avoidance, increases. Considering the above, it can be said that overinvestment in human resources has a positive and significant effect on tax avoidance. Also, the results of the analysis of the second hypothesis showed that underinvestment in human resources has a positive and significant effect on tax avoidance among Iranian companies in the period under study. This finding reflects the inefficiency of investment in human resources, and consequently, the reduction of the quality of labour is one of the main areas in reducing productivity and slowing down the development of organisations. Therefore, it is expected that by increasing the inefficiency of investment in human resources, company managers increase corporate tax avoidance to compensate for losses due to reduced productivity.

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A Comprehensive Talent Management Plan in Iranian Accounting and Auditing Using the Grounded Theory Approach

Nasser Mast Chaman, Heydar Mohammadzadeh Salteh

Department of Accounting, Marand Branch, Islamic Azad University, Marand, Iran

Ali Akbar Nonahal Nahr

Department of Accounting, Bostan Abad Branch, Islamic Azad University, Bostan Abad, Iran

Sasan Mehrani

Department of Accounting, Tehran University, Tehran, Iran

Abstract

In the present study, a comprehensive, scientific, and practical pattern is presented for the first time by relying on theory on potential remedies to manage talents in accounting and auditing using the qualitative method of the grounded theory approach. The study's statistical population includes a combination of 16 university scholars and accounting and auditing executives (or both) selected in 2020 using the targeted sampling approach based on the theoretical saturation rule. Data are gathered via interview by using the general guidance method in semi-structured form. Two methods of participants' review and review of non-participating experts are used to achieve validity and reliability of data. The main focus of the study is meritocracy for accounting and auditing. The issue is posed in three concepts of reaching a consensus about the definition of talent, creating a culture of talent management, and regularization of talent management process(attract, raise, and hold) and some strategies are formulated, and final pattern is mapped out regarding the rationale, background, and intervening conditions. By developing theory on potential remedies, this paper proposes some clear outlooks for planning and benefiting from talent management to lower human resources costs and increase efficiency in accounting and auditing.

Keywords

Talent Management, Accounting and Auditing Knowledge, Grounded Theory Approach

Corresponding author: Heydar Mohammadzadeh Salteh
Email: *h_salteh@marandiau.ac.ir*

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1. Introduction

Accounting and auditing are those sorts of knowledge that in almost all procedures, sections, and performances are associated with human factors and forces and are more accurately dependent on their performances. Hence, considering the quality and features of such factors are among the significant components, necessities, and challenges of accounting and auditing associations (Salehi & Dastanpoor, 2021). Therefore, focusing on existing talents in human forces and exerting legal and scientific management on them are among the factors that seem to be taken for granted and contribute to a considerable proportion of current accounting and auditing problems. Theory on potential remedies as one of the theories in psychology and social sciences states that there are always a remedy and potential treatments for all problems that by realizing or creating such remedies, appropriate responses can be provided for all topics and challenges (Nisbett et al., 1981, Rennekamp, 2012, Rerko & Oberauer, 2013, Tan et al., 2015, henry & Peytcheva, 2020). Talent management means facilitating and developing the occupational path of talent and expert people in an organization using the formulated guidelines, resources, policies, and processes (Salehi, Bazrafshan and Hosseinkamal, 2021). Talent management is defined as investment in the staff area, identifying substitutes and talented people in an organization and growing them to play different leadership roles (Bush, 2014). Talent management is the critical incentive for organizations (Lockwood, 2006) since it leads to high performance, quality enhancement, innovation, job satisfaction, and staff efficiency (Grobler & Diedericks, 2009). Raul believes that talents in an organization can be efficient 20 times more than ordinary people. Thus, investing in this area can bring considerable benefits for organizations (Atafar et al., 2010). In organizations, staff have different personalities and work characteristics, and this is up to the management to realize the capabilities, talents, and weaknesses (Salehi et al., 2021). The manager should look at the staff's personality features as a significant factor and utilize these capabilities and talents appropriately and in the right place. That is a topic proposed recently in the world under diversity management, which encompasses talent management and has attracted most managers in this area (Dehghanan et al., 2018). Today, attracting, growing, and keeping talented staff is probably more difficult than before. More competitiveness of the business setting, attracting and keeping talented people in an organization is a serious challenge. The employees are vital distinguishers and value creators in organizations and competitive markets of today and cause the organization to grow, move, and develop (Davoudi & Yaghoubi, 2018). The present study managed to present a comprehensive pattern for the establishment of talent management, for the first time, at a job, university field of study. It specialized level and by expanding and relying on the theory on potential remedies. The study can be a starting point for the use of talent management plans in different sections of accounting and auditing and provide an appropriate response to most of the challenges in this field. Hence, the study aims to determine the dimensions of a comprehensive talent management plan in accounting and auditing and how they are established. Given that the present study, based on the theory of potential therapies, seeks to provide a suitable model for talent management (recruitment, retention and employment, and growth and development) in the field of accounting and auditing, as explained in the research method section, we will first seek to find the appropriate components to explain the desired pattern, and in this regard, we ask and test the following questions:

Main question: How can the comprehensive talent management model in accounting and auditing be explained with the foundation data theory approach?

Special Questions:

Question 1: What are the explanatory components of talent management in accounting and auditing?

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Question 1-1: What are the causal conditions associated with talent management in accounting and auditing?

Question 1-2: What are the underlying conditions related to talent management in accounting and auditing?

Question 1-3: What are the causal conditions associated with talent management in accounting and auditing?

Question 1-4: What are the intervention factors related to talent management in accounting and auditing?

Question 1-5: What factors influence the success of talent management in accounting and auditing?

Question 1-6: What are the effects and consequences of talent management in accounting and auditing?

2. Literature Review

2.1. Talent by the Concept of People with High Performance

By talents in an organization, we often refer to those who are at the highest performance level. For example, Sills & Davel (2010) define a group of staff who can show their specific qualifications within a certain field or generally display their peculiar skills and capabilities. According to some scholars, such people are the main performance source of organizations. They have more participation (enhancing knowledge), more innovation, work smartly, attract more trust, develop more favourable business strategies, and make the changes using more effective methods. So, the advocates of such an approach believe that 75% of organizational positions should be assigned to such people.

2.2. Talent by the Concept of People with High Capacity

In this view, talents are defined as a group of staff that show a higher capacity. By capacity in this approach, we mean the individual has the required qualitative features (attitude, motivation, skills, capabilities, and experiences) for effective performance and participation in different organizational roles in the future. So, people with high capacity grow faster than their peers and show different needs, motivations, and behaviours than others.

Both said approaches indicate a special approach to talent management that, in contrast to the external attraction of general approach to talent (the growth of all employees for the flourishment of the best capabilities of them), they are proposed the most in the literature of talent management (Iles et al., 2010, Huselid, Beatty and Becker, 2005, Silzer & Dovel, 2010). According to Hoghluand (2012), a distinct behaviour of the staff based on their different talents can create a type of continuous competition in which they will be motivated to develop the firm and apply the required skills and qualities. However, the topic of realizing high-quality people is among the basic challenges for organizations.

2.3. Empirical Literature

Since the present study aims to formulate a novel model and introduce a new accounting and auditing literature concept, few studies are related to a national and international topic. Although this paper is an interdisciplinary study, the studies, findings, and even related methodologies are considered in the process. Javanbakht, Mahmoudi, & Shahtalabi (2020) explore the recruitment factors in talent management to improve the Iranian Education System's personal performance. The

study is carried out using the mixed method (qualitative-quantitative). The inferential analysis section, the confirmatory factor analysis method and the covariance-based structural equation modelling approach are used. Given the valuation methods, the recruitment, qualification, and employment methods with factor loads of 0.57, 0.55, 0.39, and 0.37 have the maximum description effect in the pattern. Mahfouzi et al. (2019) realize and describe the contributing factors to the management model using the alternative breeding approach in state-owned organizations using the mixing method. The Delphi method is used in the qualitative section, and the method of structural equations is used in the quantitative section with 353 subjects. The study's findings show that the said method is significant for talent management using an alternative breeding approach in state-owned organizations. Daroueian et al. (2019) reveal a distance between favourable conditions and the current condition of talent management based on component analysis. That means talent management suffers from some damages from structural aspects with employment conditions, the position of specialized human capital, scientific infrastructures, electronic and technology infrastructure, from basic aspects with the components of legal contexts, cultural conditions, and from contextual view with admitting components and support of managers, admitting and supporting teachers. Besides, the distance between the current condition and favourable conditions is more than other components. Davoodi & Yaghoubi (2018) conducted a study to develop an appropriate framework for the process of talent identification and succession in the higher education system with a mixed research approach. The Delphi method, Friedman test, and Kendall coordination coefficient extracted six main themes, 18 sub-components, and 118 final indicators and concepts. They provided a coherent framework based on causal factors, underlying factors, competency modelling, elitism, empowerment, and maintenance. In a study, Iqbal et al. (2016) designed and developed a talent management model for faculty members for talent-oriented universities. Quantitative findings also approved the structure of the talent management process, which includes 7 distinct dimensions, identifying and determining talent needs, discovering talent resources, attracting talent, developing potential talent capabilities, strategically applying talent, retaining talent, evaluating and aligning talent management activities, and thus provided a model for the talent management process of faculty members in universities. Al-Lozi et al. (2018) conducted a study on the impact of talent management strategies on the effectiveness of human resource information systems in commercial banks in Jordan on 310 employees of banks in the capital city of Oman. The results show that talent management strategies significantly impact Jordanian banks' effectiveness of human resources information systems. Broek, Boselie, and Paauwe (2018) dealt with collaborative innovation through a talent pool, a qualitative study of collaboration in health care. Their findings show that organizational actors' perceptions of competition are different and may hinder joint innovation with competitors while understanding common problems and stimulating collaborative resource constraints. Bradley (2016) showed that talent management in the university sector is used with organizational strategic issues, criteria for measuring academic performance, and current management methods. His research critiques the current situation for inconsistencies between organizational strategy and discovering, developing, retaining, and rewarding academic talent. O'Donohue (2016) states that the challenge for organizations today is how to protect the critical knowledge and expertise of the organization against employee layoffs. In this study, 11 managers of an organization shared their expertise through online software. He also emphasized creating a balance between staff and technology, not using academic language in planning, proper structures and rules, and the staff's key role.

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3. Research Methodology

In data foundation theory, each step begins with the data. Besides using the conventional order of data collection and then analysis, data collection and analysis in foundation data theory is dynamic, multi-layered. In this study, each interview was quickly analyzed, and its initial codes were extracted, and the next interviews were enriched with the extracted analyses. Moreover, in each interview, some repetitive codes and some new codes were extracted, and gradually we approached saturation point in an interview no. 12. But for the interviews were continued to no. 16. The present study has been conducted among all institutions and departments of accounting and auditing knowledge (including executive departments and educational and research departments). Given that in the present study, we have sought to provide a model for attracting talent in accounting and auditing, and this is beyond the model for an organization or institution and includes theoretical (educational) and executive aspects of accounting, so the interviewees were selected from both elites and leading executives, as well as prominent university professors, researchers, and accounting and auditing experts. Of course, an attempt has been made to select the interviewees based on the principle of diagnosis and theoretical purposeful sampling techniques. No threat is felt regarding the methodology and even the research results. Thus, first, based on the knowledge of experts and thinkers in the topics related to the components and dimensions of talent management, a list of 8 people was prepared and gradually made the necessary arrangements to hold interview sessions and finally in order to benefit from the snowball method, we asked him about other experts who can be effective and useful in collecting data and conducting research. In this way, we regularly updated the list of experts and followed the necessary arrangements for conducting the interviews. As with all qualitative research, the condition for completing sampling and conducting interviews was theoretical saturation plus one. Thus, 16 interviews were conducted, and after conducting preliminary studies, the texts of the interviews were prepared (typed), and the relevant analyses were performed.

Table 1. The demographic information of the interviewees (experts) of the research

Number of interviews	Average experience	Average age	Gender	Professional and specialized experiences	Type of specialization
4	18	38	Male	PhD student and faculty member	University (Educational)
2	14	39	Female		
4	19	43	Male	Certified Public Accountant, Financial Manager, and Accounting Systems Design	Executive section
-	-	-	Female		
6	23	51	Male	University faculty member and certified public accountant or senior financial and accounting manager	Academic and Executive
-	-	-	Female		

4. Findings

4.1. Findings from the Open Coding Step

Open coding is part of analysis done by precise analysis of data and their naming and categorization. For precise categorization of concepts in categories, each concept was labelled after

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categorization, and raw data were conceptualized by precise investigation of contextual interviews and notes. Collected data from interviews were coded so that their similarities and differences were identified more easily. MAXQDA software and manual method were used for coding. In Table 2, samples are shown from the analysis of interviews and initial coding.

Table 2: Some of the concepts and categories extracted from the open coding step

Main Categories	Sub-categories
Talent management to increase the quality of accounting and auditing services	The role of accounting services in improving the efficiency of enterprises, the role of accounting services in increasing the transparency of the economic environment, the role of accounting information in financing companies, the impact of accounting information and services in calculating corporate income tax, the role of auditing services in increasing the credibility of financial information of companies, the role of auditing services in creating confidence for users of accounting information.
Economic Environmental Pressure	Expanding multi-purpose enterprises with the activity levels of the whole country and the world, complicating transactions in capital markets, creating diverse capital markets with diverse and complex activities and functions, increased competition in capital markets and severe involvement of enterprises in this process, expansion of financing of companies at the international and global levels, increasing mechanisms, systems and regulatory bodies on enterprises, increasing inflation or recession in many countries and global communities, increasing the rate or cost of financing and complicating the financing process, changing and Increasing diversity in the needs of customers and business owners.
The emergence of new and advanced technologies	Mechanization of activities of enterprises, mechanization of accounting and auditing process and obliging regulatory bodies on companies to follow this process, complexity and mechanization of management information systems, the emergence of enterprises with complex mechanized and digital activities (production without factory), the dominance of mechanized and technological systems on economic markets and economic transactions, creation of new digital assets and resources based on mechanized systems and new technologies.
Increasing professional productivity	Creating synergies in the performance of accountants and auditors through their placement in talent management, improving the quality of accounting and auditing reports prepared by talented individuals (talent identification), improving the consulting role of accountants and auditors in enterprises, reducing accounting and auditing costs in enterprises by providing comprehensive and complete services by talented people, helping the managers of enterprises in managing costs and expenses by providing timely and more accurate information.
Reducing the costs of human resources	Improving the value of human resources by increasing their talent and capability, reducing the costs of recruiting and retaining talented and specialized personnel, reducing the damage caused by inefficiency or weakness of inadequate human resources, reducing the cost of attracting technical, professional, and human assistance for the development of organizations and accounting profession, increasing the synergy and efficiency of human resources.
Increasing the social status of the accounting profession	Improving the identity of the accounting profession as a talented and innovative profession, improving the quality of information and services of the accounting profession and creating transparency in economic environments, assisting enterprises in providing the required financial resources using modern accounting techniques, assisting enterprises in providing better and more desirable accounting information required by users.
Increasing the competitive advantage of the accounting profession in the capital market	Training skilled and talented personnel, training experts and committed to professional ethics and social and public responsibilities, improving the importance and position of information and accounting reports in capital markets, promoting transparency in capital markets by creating information competition between databases, helping investors make optimal economic decisions.
The Elusiveness of Talents	People with high talent and IQ usually do not stay long in routine jobs. Talented people are always looking for a higher job position, lack of job opportunities and sufficient positions for elusive talented people, increasing training costs of human resources if organizational forces are fleeing, talented people usually tend to be in the auditing profession they can grow faster.

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Familiarity with Fundamental Sciences	The need to consider sufficient knowledge of mathematics for newcomers to the field of accounting, the need for computer science education for all accounting graduates, the need to hold in-service training courses, familiarity with new computer software for all accountants, the need for familiarity with the design of information systems (using geometry and other related sciences) for accountants, the need for proper familiarity with the techniques and concepts of statistics for accountants and especially auditors.
High-performance characteristics in talents	It is being positive and having a high spirit to do work and life, being committed to the profession and its duties, making the best use of the least facilities and feeling united with the organization's goals.
High skill traits in talents	Ability to do several specialized tasks simultaneously, quickly adapt to the environment, be familiar with their job's basic sciences, and have professional creativity.
Reducing the time of activities	Quickly attaining results, avoiding wastage of time, being creative in performing tasks quickly and efficiently, having a work plan for daily tasks.
Talents' efforts to achieve professional goals	Maximum effort for the organization's benefit, taking the initiative to solve the organization's problems, properly identifying users' information needs, understanding their professional position in the organization, giving importance to the reputation and reputation of the accounting and auditing profession.
Having a good understanding of the talents of the accounting profession	Continuous updating of specialized knowledge, understanding of organizations' business environment, understanding the tasks and contingency of the accounting profession in organizations, participation in activities and communities and professional organizations, striving to improve and enhance the credibility and status of the accounting profession.
Behavioural weaknesses in talents	Tending towards arbitrary and unusual behaviours, quick-wittedness and asking for too much attention in the organization, lack of teamwork and hierarchy, high sensitivity and obsession, expecting high scores from the organization, being assertive, and having false pride.
Communication weaknesses in talents	Lack of knowledge transfer in the process of teamwork, introversion, and collectivity.

4.2. Findings from the Axial Coding Procedure

Axial coding means determining the patterns in the data. At this stage, the central and sub-categories of research are displayed in a model. This very simple and, at the same time, very general model helps to clarify the relationships between a phenomenon, the reasons for its emergence, the strategies used to interact with the phenomenon and its consequences, the context, and conditions of the interventionist. During axial coding, the categories derived from open coding are divided into six categories: axial category, causal conditions, interferer’s conditions, contextual conditions, strategies (actions or reactions), and consequences. Among the extracted categories, meritocracy is considered a central category located in the model's centre. The reason for choosing this category as the central category is that most data can see its traces. In other words, according to most respondents, the establishment of a talent management model requires proper management and special methods and models, and the current methods and procedures can not be very successful in this regard. Therefore, this category can be placed in the centre, and other categories can be linked. The label chosen for the central category is also abstract and, at the same time, comprehensive. Axial coding relates categories to the concepts displayed in interviews with participants. Continuous comparative analysis is used to determine the characteristics of a category and the dimensions of the feature. From the continuous comparative analysis of the preliminary results of open coding, 33 categories and 207 concepts have been extracted.

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4.3. Findings from Selective Coding

4.3.1. The Central Category of Research

The first axis in the talent management model in accounting and auditing is "meritocracy," which includes five dimensions: defining the concept of talent in accounting and auditing, creating attractiveness for talented and qualified people, understanding the added value of talents, introducing different functions and roles of accounting and auditing. Regarding the factors related to the implementation of talent management, 5 dimensions have been proposed, including understanding the philosophy of talent management in accounting and auditing, proper designing of talent management model, the existence of obligation and diligence and acceptance for talent management implementation, lack of resistance and barriers to implementing talent management, creating the necessary space and appropriate committees for implementing talent management. Talent management in the executive levels of accounting is another axis that consists of 6 components, including determining the dimensions of talent management, explaining the dimensions of the concept of talent in accounting and auditing, explaining the prerequisites for using talents, explaining suitable opportunities for talent exploitation, creating necessary structures and contexts for implementing talent management, the familiarity of managers and employees of organizations with the talent management model and how to implement. Another axis that has been raised in this section is the development of talent management, which includes 4 components: providing a comprehensive and consistent definition of the concept of talent in accounting and auditing, designing a comprehensive model of talent management in accounting and auditing, strengthening and discovering talents related to employees and the forces in the accounting profession, creating the necessary legal and supportive bases for the establishment of talent management in accounting and auditing. There is another axis called talent planning and management, which consists of 5 components, including the inclusion of talent management mechanisms in recruiting human resources, understanding talent management in promotion and growth programs, organizing the necessary programs to discover potential talents in the working forces, allocating talents in their favourite and desirable tasks and responsibilities, and creating a separate payment mechanism for talents.

4.3.2. Causal Conditions

The causal conditions for designing the talent management model in accounting and auditing are first divided into two main parts: internal and external. Internal factors include the need to continuously increase the quality of accounting and auditing services, develop new aspects of the accounting and auditing profession, and globalize accounting and auditing standards and services. External factors include economic pressures, political and social pressures, the emergence of new and advanced technologies connected with accounting information systems. Concerning internal factors, the attention given to accounting and auditing and the practitioners' services has changed fundamentally, which requires different management practices in accounting and auditing knowledge. The design and implementation of the talent management model can be the key. Through talent management, it is possible to employ working forces that can be flexible and creative in providing accounting and auditing services, and inevitably, sooner or later, we must seriously move in this direction.

4.3.3. Strategies

Inferred strategies are the leading executive core for the talent management model because their accuracy and precision will achieve the appropriate and more access to the expected goals and

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outcomes. The carelessness and inappropriateness of these strategies will also lead to misguidance and failure to implement the management model. Talent identification or merit selection is the first step to implementing the talent management model, which includes appropriate and logical evaluation of candidates for accounting and auditing (entering the field of accounting and accounting or auditing), identifying talents realistically, and pre-determined and acceptance criteria. The grounds for talent management also largely reflects the context for the talent management model, including talent acquisition, agreement on the concept of talent in accounting, culture building for talent management, designing and adopting a comprehensive talent management model for the profession, and attracting all relevant persons in the profession. Optimal utilization of talents is another strategy that officials and all relevant persons should consider. In this research, strategies of talent exploitation have two positive and negative dimensions. In the positive dimension, creating a favourable and effective work environment for talents, and in the negative dimension, "loss and lack of proper treatment of talents, lack of belief of relevant people in talent" has been inferred. After identifying and attracting talents and planning to exploit them, another strategy has been inferred about developing and nurturing talents. In this strategy, basic concepts have been identified, including continuous and regular training and development of talents, creating a space for talent participation, and encouraging and improving the professional abilities of talents. The last strategy identified in the present study for the talent management model is the necessary conditions for retaining talents. The basic concepts of this strategy are also classified into two dimensions, positive and negative. On the positive side, creating a proper service compensation system, professional talent support, promoting the professional prestige of accounting and auditing, creating a suitable functional position for talents, evaluating the continuity of talents in people identified and recruited as talents, and creating a dynamic career path have been identified. On the negative side, behaviours have been identified to seriously threaten the longevity of talents and the continuity of their services. On the negative side, behaviours and policies have been identified, including a uniform service compensation system for talented working forces and other employees, ignoring the importance of talents, not defining specific job opportunities for talents to be creative, and providing special services. Suppose we do not pay proper attention to the retention of talents. In that case, the costs of implementing the talent management model will be much higher, and the desired added value will not be achieved, which means the failure of talent management in the true sense. Regarding the definition of the concept of talent in accounting, interviewee No. 8 states that "On the other hand, in the executive and practical aspects of the accounting profession, talented people are those who are fully acquainted with the country's commercial laws, relevant tax laws and directives, accounting and auditing standards, the manner of properly preparing accounting reports, membership in reputable communities and associations of the accounting and auditing profession, code of conduct for accountants, working with accounting and financial software, mathematical knowledge and related basic sciences and so on.".

4.3.4. Interferer’s Conditions

In the present study, interferer’s conditions include events and factors in meritocracy and merit selection. In this regard, intervention factors are divided into two general categories: internal factors of the accounting and auditing profession and external or environmental factors. Internal factors include the elusive nature of talents, the need for familiarity with basic sciences such as mathematics and computer sciences, and the expectations of accountants and auditors and external factors include expectations of accounting and auditing clients, economic conditions, and economic

system (private /public), job and organizational position of accounting and auditing. In this regard, one of the experts states that "Accounting and auditing clients always raise new needs and expect the accounting profession to be able to respond to these needs quickly, accurately and with higher quality, while this is not always very convenient and possible to be implemented." Another interviewee states that "Accounting and auditing knowledge, like other knowledge, is rapidly becoming more mechanized, and the role of electronic software and equipment is becoming more and more complex, and accounting functions are becoming more complex. It necessarily demonstrates the need for mastery of related basic sciences such as mathematics and computer sciences."

Also, regarding the elusive nature of talents, interviewee No. 5 believes that "I must first state that due to the elusiveness and diversity of talents, it is better to employ and exploit them in the auditing profession, because accounting tasks are somewhat repetitive and are done daily, and this will certainly not be a permanent and desirable acceptance for talents."

4.3.5. Underlying Factors

The first concept or component identified and highlighted by many interviewees is the characteristics of the talents; what are the characteristics of the people who will be identified as talented? Also, the negative characteristics that elite and talented people usually manifest should be properly identified. The necessary arrangements for them should be identified and classified in the form of negative characteristics of talents. Positive traits of talents include high-performance traits, high skill traits, good personality traits, reduced work time, understanding and striving to achieve professional goals, high mental abilities, a good understanding of tasks, and motivation for professional advancement. Moreover, the identified negative characteristics of talents include work and performance weaknesses, behavioural weaknesses, moral weaknesses, and communication weaknesses. Regarding the conditions for being elite and the flourishing of talents in accounting and auditing - especially in the early working days, one of the experts (interviewee no. 5) states, "accountants should enter the accounting and auditing executive environment when they are single and do not have any family disputes, due to the variability of their workplaces and incomes so that they can have the necessary focus to learn jobs and improve their abilities."

The accounting profession's maturity is the second category identified to the accounting talent management model's underlying conditions. It includes concepts such as services and the role of the accounting unit, reporting, processability, information technology development, participation in organizational risk management, and human resources. The third identified category about the contextual conditions of the talent management model in accounting and auditing indicates how to manage and classify the accounting profession and includes two main groups of positive and negative features. In line with the contextual conditions and justification of talent management in accounting and auditing, interviewee no. 7 also states that "the moving of global markets towards full competitiveness requires organizations to use new tools to calculate the real cost, actual performance appraisal, proper analysis of environmental markets, development, and diversity of products and services, improving the quality of products and services, increasing the diversity of legal and optional reports and the need to observe the relevant schedule and requirements, etc. strictly. Organizations have obligated the accounting profession to implement the model of talent management and use the services of talented people with a proper and real understanding of the nature of the accounting environment and accounting tasks and services, so this could be a good platform for an accounting talent management model."

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4.4. Implications

Regarding the implications of the talent management model, interviewee no. 4 states that "it can strengthen and dynamize the creation of integrated information and reporting systems and improve the level of specialized training in the accounting and auditing profession, thereby increasing the level of knowledge and expertise and completely improve the flexibility of accountants and auditors." Interviewee no. 6 also states that "Talent management model can lead to the entry of young and talented young people into the accounting and auditing profession, and hence training and accounting theories, as well as practical implementation and accounting and auditing reports, will significantly improve and information transparency in society and capital markets will also increase, leading to reduced corruption and injustice." Interviewee no. 7 also expressed an interesting view on the implications of the talent management model in accounting and auditing and believed that "the implementation of talent management can take the accounting profession out of its static and outdated state and make it a dynamic, flexible and effective profession. Implementing talent management can also increase motivation for improvement in other employees and provide them with appropriate role models for organizational and professional activities and continuous improvement." Besides, it seems that the talent management model in accounting and auditing can provide a proper answer to some of the fundamental and long-standing challenges and problems of accounting. In this regard, interviewee no. 9 expressed an interesting view and believed that "I believe that the problem of measurement in accounting can be answered by doing talent management and the optimal use of special abilities and talents of talents." Thus, it can be expected that with further and continuous studies on the talent management model, fundamental changes and developments can be made in the theoretical and executive realm of accounting and auditing:

4.5. Reference Validation of the Proposed Pattern

Unlike quantitative research, qualitative research does not have specific validation tests. In qualitative research, validity or validity does not have the same implicit meaning of validity in quantitative research, and validity comparison is not significant. Corbin and Strauss (2008) oppose using these two criteria for qualitative research and suggest that researchers use the acceptability criterion. In the present study, the model is validated based on the views of Corbin and Strauss (2008) and Merriam (1988). Proportionality index (consistency with other experiences): Proportionality index means whether the research findings are consistent with human resources experts' experiences and research participants? In order to achieve the proportionality index, the research findings have been evaluated, corrected, and confirmed by three experts who specialize in implementation as well as in accounting and auditing training; Applicability index: The model of this research can be applied practically, scientifically and academically. In the executive field, the extracted model of the present study can be used in planning to attract talent in accounting and auditing, and the considerations of causal, contextual, and interferer’s conditions of profession or knowledge of accounting and auditing are included in it. Concepts index: In this regard, concepts have been produced under categories with their own characteristics and dimensions. The definition of each concept has been mentioned. Conceptualization Index (in what context did the concepts find meaning?): Findings and concepts from the current research are also expressed in the accounting and auditing profession. Different stages of the current research, from data collection to analysis and reporting of accounting and auditing platforms, have been considered. Index of the rationality of research narrative: In the current research, to maintain the rationality of the research narrative, an attempt has been made to make the research findings meaningful and relevant to the facts.

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Moreover, to assure the users, the research model, methodology, and data collection method have been adequately explained and expressed. Depth index (detailed expression of research narrative):

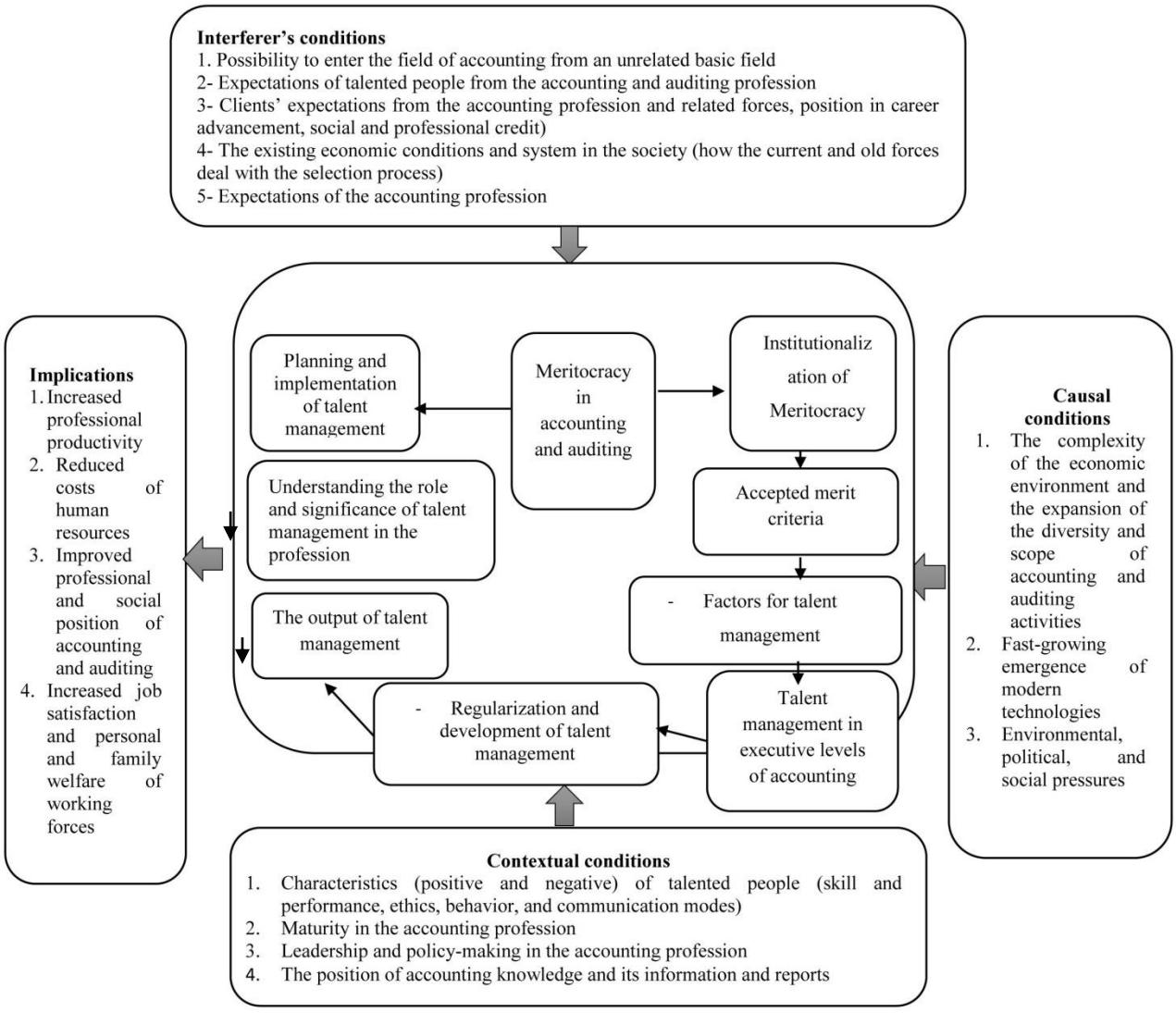

Figure 1. The proposed comprehensive research model for talent management in accounting and auditing

In order to deepen the current research, the research model is mentioned with details and by mentioning codes, concepts, and categories. Deviation index (referring to exceptions and contradictory cases with the findings): In the present study, the findings which did not fit the desired research model have been mentioned in different sections; for example, one of the interviewees stated that "the accounting profession is inherently a routine activity with specific tasks and executive standards in which anyone can specialize and perform their duties through continuity and experience, and there is no need for highly talented people and talent management model in this field"; In contrast, almost all interviewed experts believed that accounting and auditing services and information is one of the most sensitive information in society and is subject to change in economic and even social environments daily and needs development and flexibility and identifying the needs of intra- and inter-organizational users will require creativity and high talent. Innovation index (presenting new concepts): In the present study, the researcher considers

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innovation and the expression of novel concepts and dimensions. Many of the emerging concepts and new codes have been conceptualized and named during the current research process in implementing the talent management culture, sensitivity Index. Since the researchers of the present study are working in the executive and scientific affairs of accounting and auditing and have experience in training accounting courses to the highest levels and membership in the community of certified public accountants and other executive and managerial accounting and auditing duties and are concerned with the proper implementation of the talent management model in this field, the current research topic and the process has been very important, attractive and vital. Index of using notes (hunting ideas for creating a conceptual framework): In the current research, several notes and reminders were recorded, which was widely used during the analysis and development of the research model.

5. Conclusions

By considering the role of accounting in the current world and the higher sensitivity and complexity of issues related to accounting and auditing, and the need to increase the capabilities of accountants and auditors in performing their services and duties in the community more accurately and with higher quality. The current study, relying on potential treatment theory, seeks to provide a suitable model for success and structuring the recruitment, development, and retention of talent and qualified people for accounting and auditing in its theoretical and practical aspects and using the data theory qualitative research method and conducting semi-structured interviews with academic and executive experts, a model has been proposed for this purpose. The central category of research is "The role and importance of talent management and meritocracy" in accounting and auditing, which is expressed in six concepts of meritocracy and merit selection; factors related to the implementation of talent management; talent management in the executive levels of accounting, development of talent management, planning and implementation of talent management, and outputs of talent management and given the casual, contextual and interfering conditions, practical strategies for codifying the final research pattern has been presented. A total of 33 main categories and 207 concepts have been extracted. The proposed research model can guide both the knowledge and profession of accounting and auditing in managing talents and creative and efficient people. Of course, the success of this model requires serious and real efforts of officials and policymakers of accounting and auditing knowledge and profession. It will succeed when the real need for talent is felt like a necessity. At present, there is no clear and coherent definition of talent and talented people in accounting and auditing, and there is no clear agreement in this regard. Some managers and accounting and auditing officials, although seemingly showing that they seek meritocracy and the use of talented people, they first do not have a clear definition of this process and how to achieve it; Secondly, they do not make a serious and real effort to implement talent management and meritocracy, because many of them believe that talents do not have good moral characteristics and have behaviours such as monotony and avoiding teamwork, arrogance and excessive pride and the like. They disrupt the administrative integration of the organization! Of course, in the present study, the necessary and appropriate answers to these views have been provided (while implicitly confirming the existence of the mentioned behaviours), and we have shown that we should pay attention to the positive points and potential effects of talents and take appropriate actions against unwanted cases in the organization's programs. There are no specific actions and cases of specific efforts and models and programs for meritocracy in the field of knowledge and accounting and auditing profession, which causes many current and even future shortcomings and challenges of this

knowledge. The nature and tasks of accounting and auditing knowledge are such that there is always a need to update tools and tasks and keep pace with rapid developments and changes in the environment. Human factors and resources perform all activities, so you cannot preserve the role and position of the profession without using the appropriate and creative, and talented human resources in a worthy and real way, and will surely lose the position easily and quickly in the event of a serious competitor for this knowledge. However, continuing the current trend will cause serious problems and shortcomings to society, contrary to the philosophy of the emergence and continuation of professions and sciences.

In line with the applied objectives of the research, and according to the findings and the proposed research model, the present study has provided the following practical suggestions:

1-Policymakers and officials of theoretical and executive aspects of accounting and auditing are recommended to study the necessities of talent research in this research and make a serious effort to benefit from the undeniable effects of attracting talents in this field, such as applying these cases in attracting new students in these fields as well as in awarding professional qualifications to applicants.

2-It is recommended that all managers of institutions, accountants, and auditors consider the various components of the proposed research model in attracting the forces they need first to use the best and most effective forces. Secondly, an incentive for all applicants should be created for accounting and auditing and existing staff to upgrade their capabilities and achieve the desired conditions.

3-It is recommended that all applicants enter accounting and auditing and the forces in these fields to pay serious attention to the components in the proposed research model and how to achieve them to be absorbed with less difficulty and achieve the necessary and expected success.

One of the main tasks of scientific researchers will be to express the limitations of their research. Certainly, no scientific research is free from limitations, and their expression will prevent the findings from being misleading. The present study was conducted using the qualitative research method of the foundation data theory, and the research data was collected by the semi-structured interviews method. Due to the different recruiting and formulating policies, the predominantly governmental conditions of the economic sectors in Iran and the governmental nature of policymakers in the scientific-theoretical and executive aspects of accounting and auditing can provide restrictions on the implementation and full success of the model in these sectors. This should be considered in the use of the proposed model.

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The Effect of Board Characteristics on Intellectual Capital: Case of Iran and Iraq

Hossien Shaval

Economics and Administrative Sciences, Baghdad University, Baghdad, Iraq

Safoura Rouhi

Economics and Administrative Sciences, Khayyam University, Mashhad, Iran

Abstract

The present study is concerned about the relationship between the board characteristics and intellectual capital efficiency in companies listed on the Iran and Iraq Stock Markets. A multivariate regression model is used for this study. Research hypotheses were tested using a 903 firm-year observation sample from the Tehran Stock Exchange and 280 firm-year observations from the Iraq Stock Exchange during 2012-2018 for both counties based on multiple regression patterns and pooled data techniques. The results show that there is a significant relationship between board characteristics and efficiency of intellectual capital, which means there is a negative and significant relationship between the board independence, the board size, CEO ownership, and CEO gender, and intellectual capital and a positive and meaningful relationship between CEO change and intellectual capital both in Iran and Iraq. However, while the relationship between board independence and intellectual capital is negative in Iraq, such a relationship is positive and significant in Iran.

Keywords

Intellectual Capital, Human Capital Efficiency, Structural Capital Efficiency, Communicational Capital Efficiency, Board Characteristics

Corresponding author: Safoura Rouhi
Email: *safoura.rouhi1993@gmail.com*

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1. Introduction

Within today's knowledge-based economy, intellectual capital is the essential property of every organisation and can contribute to performance from different aspects. Although the traditional accounting methods play a significant role in the measurement and reporting of tangible assets, within a knowledge-based economy where knowledge constitutes a considerable proportion of properties, conventional accounting methods cannot measure and report the existing expertise in the organisation that requires some remarkable changes. In intellectual capital accounting, properties have no physical property, but they have considerable benefits for the firm's future cash flow. Therefore, the inability of intellectual capital reporting is indicative of the failure of typical or traditional accounting. However, their valuation in commercial deals is not an easy task and not possible with current methods. Moreover, there is no theory or actual economic model for intellectual capitals (Gogan, 2014).

The position and role of the firm's intellectual capital, financial performance, and organisational value creation are consolidated in the literature of the global economy. Various empirical studies across multiple business sciences areas show that wise and experienced staff or managers contribute positively to the firm's value and performance. However, these studies focused on a firm's human resources' intellectual capital and took the board's intellectual capital for granted. Similarly, even the most comprehensive studies on corporate governance describe the structures and different processes of management. Still, they do not refer to intellectual capital criteria or the knowledge of the board. Hence, a significant gap remains in sound governance structures and restricts the understanding of corporate governance's impact on firm performance and value (Kalyta, 2011).

One of the key corporate governance topics currently available to firm management and shareholders is the board member characteristics (Carter, Simkins and Simpson, 2003). Smith (1937) declares that managers do not always move forward to maximise shareholders' interests. A conflict of interests between owners and management has brought about agency problems, leading to firms' intellectual capital being inefficient and failing in the competition. Hence, according to Jensen and Mechling (1976), supervisory mechanisms should be implemented to fill the gap between ownership and management. One of the existing mechanisms to reduce agency problems and information asymmetry between managers and shareholders is an efficient board as one of the corporate governance's internal mechanisms.

By considering the significance of board characteristics in today's business world, the present study concerns the effects of some board features on the intellectual capital of companies listed on the Iraq Stock Exchange. The concept of intellectual capital is not clear, and different definitions are proposed for that. In this regard, Rezaei et al. (2018) consider intellectual capital a working strategy used simultaneously in the entire organisation and is a tool for advancing an organisation's general plan. The conducted studies in the corporate governance system in different countries show that the enhancement of corporate governance and, more importantly, the presence of an efficient board would lead to the growth of the capital market in those countries, and there is a strong correlation between these two factors (Rodrigues, Tejedo-Romero and Craig, 2016). Given the facts mentioned above, the question here is whether the relationship between board characteristics and intellectual capital is significant or not. Thus in this paper, the main objective is to analyse the relationship between board characteristics and intellectual capital efficiency in companies listed on the Iraq Stock Exchange, compare the results with the studies carried out in Tehran Stock Exchange, and propose some keynotes in this field.

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2. Theoretical Principles, Literature Review, and Hypothesis Development

2.1. The Board Size

We mean the number of board members by the board size, which is a significant factor in its effectiveness. We can observe different approaches to the relationship between board size and its effectiveness by reviewing the literature. From the agency's point of view, we can argue that a giant board is most likely cognizant of the agency problems because many people supervise the management works (Nicholson and Kiel, 2003). Because the board's central role is to monitor the management, studies on the board size only focus on supervisory issues (Xie, Davidson and Dadalt, 2003).

2.2. The Board Independence

Board independence is the unbounded members of the board. An unbound member of the board is a member who has no executive responsibility in the firm. The number of unlimited board members has a positive relationship with supervisors' effectiveness in providing financial statements (Beekes, Pope and Young, 2004). According to Fama and Jensen (1983), firms' board plays a pivotal role in the governance system. The board's primary function is to create efficient governance for firms, provide independent supervision in executive managers' performance, oblige the managers to be responsible against shareholders, and balance different beneficiaries' interests. Therefore, people believe that when the board is more independent, it has more supervision of the executive managers (Beasley, 1996; Peasnell, Pope and Young, 2000; Klein, 2002).

2.3. CEO Change

CEO change includes any replacement in the CEO position, the CEO's replacement of the previous year with a new person in the current year. CEO certificate (CEO financial expertise): financially educated management members are another characteristic of the firm board. The CEO should have certain features and skills, especially in finance, and should be an expert, experienced, and at the same time competent to be able to carry out the responsibilities, ideally.

2.4. CEO Gender

The CEO is Male 1; otherwise, it would be 0 (if the CEO is female). Most of the studies on CEO gender diversity are based on how women's agency would improve the firm value. For example, some studies perceived that a firm with gender diversity would perform better in management because women benefit from some unique characteristics of resources and human capital for business (Campbell and Minguez-Vera, 2008), while other studies have found an opposite effect (Bohren and Storm, 2010; Adams and Ferreira, 2009) and some others discovered no relationship (Carter et al., 2010).

2.5. Intellectual Capital

Edvinsson and Sullivan (1997) define intellectual capital as the knowledge that can be turned into value. Marr (2004) describes intellectual capital as propulsion for a firm's competitive advantage and associates with firm capability in management and knowledge application. Moreover, the Canadian Association of Management Accountants defines intellectual capital as an item of knowledge preserved by people, shared for acquiring future profits (Lswati and Anshori, 2007). An issue for which there is a consensus is that intellectual capital indicates an intangible value of an organisation, which is hard to express. Bontis (1998), Edvinsson and Sullivan (1997), and Stewart

(1997), in their classification, divide intellectual capital into three components of human capital, structural capital, and relational or customer capital.

2.6. The Relationship between Corporate Governance Components and Intellectual Capital

Different studies (e.g., Safieddine, Jamali and Noureddin, 2009; Chen, Cheng and Hwang, 2005; Wang, 2008; and Salehi, Enayati and Javadi, 2014) show that corporate governance is a significant factor in attracting intellectual capital. The presence of an appropriate corporate governance system increases firms' capability for more absorption of intellectual capital (Safieddine, Jamali and Noureddin, 2009). Corporate governance benefits all the firm's financial beneficiaries, including investors, creditors, board members, management, staff, and different industries and economic sections. Appropriate corporate governance plays a significant role in improving efficiency and economic growth and, at the same time, elevates the trust of investors, which contributes to the country's economy. Firms benefit from a sound corporate governance system, and in case the firm is profitable, there is a higher motivation for using the corporate governance, the advantages of which affect either directly (via easy access to financial resources and lower capital expense) or indirectly (via gaining fame and more business opportunities) the economic system. In other words, the absence of an appropriate corporate governance system in firms would lead to an inability to attract and hold substantial intellectual capital (Safieddine, Jamali and Noureddin, 2009).

Ku Ismail and Al-musalli (2012) argue that intellectual capital performance in banks mentioned by GCC is lower. Contrary to our expectations, the number of independent managers negatively relates to intellectual capital performance in banks mentioned by GCC. All other variables have no relationship with intellectual capital. Ishak and Al-Ebel (2013) indicate that intellectual capital disclosure is positively associated with the board's effectiveness. These findings are significant for policy-makers regarding the board's effectiveness in supporting investors at the asymmetry level. Oba, Ibikunle and Damagum (2013) declare that the board's independence and audit committee independence cannot describe the independent variable. The board size has a positive and significant effect on the information disclosure quality of intellectual capital. Bohdanowicz and Urbanek (2013) conclude that managerial ownership, external ownership, institutional ownership, and ownership concentration positively affect intellectual capital and capital return productivity, especially structural capital. The study results show that the interaction between ownership structure and intellectual capital productivity is different in high-tech and low-tech industries. These findings suggest that the ownership structure plays a significant role in intellectual capital and creating productivity.

Elsaid and Ursel (2011) found that if the percentage of women on the board is higher, regardless of other succession characteristics, such as whether the new CEO is from inside or outside the company, the successor CEOs are more likely to be women. In addition, changes in CEOs from male to female are associated with reducing several firm risk metrics. Samaha, Khlif and Hussaineyc (2015) show that the board size, board composition, and audit committee positively and significantly affect voluntary information disclosure, while CEO duality has a negative impact on voluntary information disclosure. Attarita, Dampitakseb and Panmanee (2017) express that the audit committee sessions positively affect the intellectual capital return. Simultaneously, some factors like the size of the audit committee and the frequency of board sessions have a negative effect on intellectual capital efficiency. However, this is not obvious whether the proportion of board independence, the percentage of women on the board, or firms with a separate CEO and director contribute to the intellectual capital or not. Ku Ismail, Abu Bakar, and Al-Musalli (2016) figure out that state-owned firms have lower intellectual capital performance than private firms. Intellectual

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capital performance is also more economical for firms with equal CEO and director than firms that separate these positions.

Moreover, firms' governance and ownership structure play a pivotal role in intellectual capital performance among Malaysian firms. Liu, Pang and Kong (2017) declare that export increases the firm innovation; remarkably second, different types of human capital have different and mediating effects. More specifically, retired managers have a determining and mediating role in the relationship between export and innovation, while highly educated staff has adverse moderating and opposite effects. Torre et al. (2017) show that regardless of the intensity of organisational technology, voluntary turnover has a negative impact on the relationship between human capital and labour productivity. In contrast, non-voluntary turnover increases the relationship between human capital and labour productivity and is even more useful for organisations with more compact technological operations.

Debrah, Oseghale and Kweku (2018) indicate that Africa's long-term growth overview relies on human capital development. South African countries' stability requires education and labour training in the global market's skills centre. Mthanti and Oiah (2018) perceive that the relationship between human capital is strong at economic development levels. Sardo and Serrasqueiro (2018) argue that the return on the current period's intellectual capital positively affects European firms' financial performance with high, medium, and low technology. Besides, a non-linear relationship was found between growth opportunities and financial performance. Findings indicate that more efficient use of firms' intellectual capital affects the positive relationship between growth opportunities and financial performance. The results show that the effective use of intellectual capital impacts large firms' growth opportunities in the current period. Further, there is a non-linear relationship between ownership concentration and growth opportunities. Gomez-Mejia et al. (2019) indicated that female CEOs are considered more conservative and risk-averse than male CEOs. The results also confirm those female CEOs in low systematic risk areas, although more conservative, take more cautious risks that produce better long-term outcomes than their male counterparts. Shan (2019) found that managerial ownership and board independence have a negative impact on company performance. Also, board independence has a negative relationship with managerial ownership and vice versa. Ozbek and Boyd (2020) indicated that firm size has significant moderating effects on the relationship between governance structure and market performance. Shukla, Narayanasamy and Krishnakumar (2020) found that board size positively affects the Indian banks' accounting performance. In addition, board size is insignificant in determining the quality of Indian banks assets. Andreeva et al. (2021) found that when a country's environment has more access to skilled labour, a company's human and structural capital has less of an impact on its innovation performance. Troise et al. (2021) showed that relational capital positively influences collective investment decisions and explains the success of collective equity financing campaigns. While factors related to human capital and structural capital have a limited positive effect on investment decisions. Salehi et al. (2021) found that knowledge management positively and significantly affects intellectual and social capital relationships. Also, intellectual capital and social capital have a significant impact on innovation. D'Amato (2021) showed that companies with high levels of intellectual capital have less financial leverage and are more profitable and riskier than companies with low levels of intellectual capital. In addition, the results showed that the company's profitability and risk mediate the relationship between intellectual capital and financial leverage. Zahedi and Naghdi Khanachah (2021) found that knowledge management processes affect the development of an organisation's intellectual capital. Knowledge management processes also help

raise the level of innovation in the organisation through the development of intellectual capital. The results also showed that managers should focus on developing their human capital through young educated professionals to maximise internal capacity, create knowledge, and move towards improving the organisation's human capital. Potharla and Amirishetty (2021) indicated that the relationship between board size and board independence with a company's financial performance is non-linear inverted U-shaped. Chalu (2021) found that board size and gender diversity significantly negatively affected audit report delays. Khong, Hooy and Lye (2021) indicated that board independence has a negative effect on private information-based trading, and this effect can be strengthened by the disclosure quality, female independent Managers and board gender diversity, while the CEO duality weakens this effect. Alves (2021) found that the decline in the quality of profit associated with CEO duality is weakened when the board has a higher proportion of independent managers. Rashid (2021) indicated that board independence does not affect the corporate social responsibility activities and the relevant report. However, the lack of impact of board independence and corporate social responsibility reporting is offset by the power of shareholders. Domestic ownership, firm age, firm size, growth opportunities, and market capital positively impact such reports. Ting (2021) found that female CEOs have the same power and performance as male CEOs in a sample of Chinese banks. When women reach the top, they have more prestige and ownership than men. Female CEOs perform even better than male CEOs in non-governmental banks. Brueckner Bosak and Lang (2021) indicated that a comparison between male and female CEOs showed that female CEOs showed less power and more motivation than male CEOs.

Given the facts as mentioned earlier, the hypotheses of the study are as follows:

H_1: There is a significant relationship between board independence and intellectual capital in companies listed on the Stock Exchange of Iraq and Iran.

H_2: There is a significant relationship between board size and intellectual capital in companies listed on the Stock Exchange of Iraq and Iran.

H_3: There is a significant relationship between CEO change and intellectual capital in companies listed on the Stock Exchange of Iraq and Iran.

H_4: There is a significant relationship between CEO gender and intellectual capital in companies listed on the Stock Exchange of Iraq and Iran.

3. Research Methodology

This study is causal-correlational. The methodology is quasi-experimental, and retrospective within positive accounting studies carried out based on real information.

3.1. Statistical Population

The statistical population of the study is limited to the following firms:

1- Have no change in the fiscal year during the period of study (2012-2018) in Iraq and Iran,
2- Their financial information is available,
3- Are not affiliated with financial firms (banks, financial institutions) and investment or financial intermediaries, and;
4- Are active during the period of study.

Hence, the study period includes five consecutive years from 2012 to 2018 for listed firms on the Iraq Stock Exchange and 2012-2018 for listed firms on Iran Stock Exchange.

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Given the limitations, 129 firms were selected for Iran and 35 firms for Iraq to test the hypotheses.

Table 1. The number of firms in the statistical population

Description		Firms eliminated in total periods	Total no. of firms
Total listed firms on the Tehran Stock Exchange			445
Eliminating financial intermediaries, finance, insurance, and investment firms		88	
Firms with more than six months of transaction halt		112	
Firms entered the stock exchange during the period of study		4	
Elimination due to information unavailability		112	
Statistical population			129
Listed firms on Iraq Stock Exchange	No. of firms	Eliminated firms	Selected firms
Bank firms	39	39	
Insurance firms	5	5	
Investment firms	9	9	
Service firms	10	4	6
Industrial firms	25	10	15
Hotel and tourism firms	10	2	8
Agricultural firms	6	0	6
Telecommunication firm	2	2	
Financial transfer firm	17	17	
Total sample firms	123	88	35

3.2. Data Collection Method

The required information about the study was gathered from different resources. Data related to the research literature and theoretical issues were collected from library resources, including books, Persian and Latin journals, and internet websites, and data related to firms (balance sheets and profit and loss statement) were used as the research instrument. Primary and raw data and information required for hypothesis testing were collected by using the information bank of Tehran Stock Exchange, including Tadbir Pardaz and Rah Avaran-e Novin Software, as well as published reports of Tehran Stock Exchange via direct access (by analysing the disclosed reports in the Codal Website then manual collection) in the form of CDs and online website of rdis.ir and from other required resources.

3.3. Data Analysis

The data analysis method is cross-sectional and year-by-year (panel data). In this paper, the multivariate linear regression model is used for hypothesis testing. For analysing the obtained data, descriptive and inferential statistical methods were employed. The frequency distribution table was used to describe data, and at the inferential level, F-Limer, Hausman, normality, and multivariate linear regression tests were used for hypothesis testing.

3.4. Research Model

The following multivariate regression model is used for hypothesis testing:

Model (1)

$$VAIC_{it} = a_0 + a_1 BInd_{it} + a_2 Bsize_{it} + a_3 CEO.change_{it} + a_4 CEO.share_{it} + a_5 MTB_{it} + a_6 GCEO_{it} + a_7 Return_{it} + a_8 Loss_{it} + a_9 size_{it} + a_{10} LEV_{it} + a_{11} ROA_{it} + a_{12} ROE_{it} + a_{13} Growth.sales_{it} + a_{14} Age_{it} + a_{15} Year_{it} + a_{16} Industry_{it} + \varepsilon_{it}$$

Where:

VAIC: is the intellectual capital that Pulic's model calculates

BInd: is the board independence, which is equal to the unbounded members of the board to total members of the board

Bsize: is the board size that is equal to total board members

CEO change: is a CEO change that if the CEO is changed 1, otherwise, 0.

GCEO: is CEO gender that if the CEO is male 1, otherwise 0.

Size: is the firm size, which is the natural logarithm of firm assets

LEV: is the financial leverage of the firm, which is equal to total liabilities to total assets of the firm

ROA: Return on assets which are equal to net profit to total assets of the firm

ROE: return on equity, which is equal to net profit to book value of equity

Growthsales: growth in sales is equal to the sales of the current year minus that of the previous year divided by the sales of the last year of the firm

Age: firm age is equal to the time interval between data of establishment and the year understudy

Loss: a substantial loss that if the firm is losing 1, otherwise 0.

Return: stock return is equal to the market value of the current year minus that of the previous year plus the dividends divided by the market value of the last year

CEO_share: CEO ownership, which is equal to the amount of share available to the CEO divided by total shares published by the firm

MTB: book value to return on equity of the firm

Year: dummy variable of the year

Industry: dummy variable of the industry

It is worth mentioning that the above models were tested only once for Iranian and Iraqi firms' data, then their outputs will be analysed and discussed.

4. Data Analysis

4.1. Descriptive Statistics

In this paper, four models analyse board members' independence, size, board members, and gender on intellectual capital. The present study encompasses the panel data method in its database, including 129 Iranian and 35 Iraqi firms. For estimating the model, the variable of intellectual capital is used.

Moreover, for modelling the intellectual capital, some variables like board independence (Bind), board size (Bsize), CEO change (CEO change), CEO ownership (CEO share), book value to market equity of the firm (MTB), CEO gender (GCEO), stock return (Return), dummy variable of firm loss (Loss), firm size (Size), financial leverage (LEV), return on assets (ROA), return on equity (ROE), sales growth (Gross Sale), firm age (Age), and dummy variables of industry and year were added to the model as the descriptive variable. The primary source of these data is the Central Bank, Tehran Stock Exchange, Codal Website, and Rah Avard-e Novin Software. Tables 2 and 3 illustrate the information of the model variables for Iranian and Iraqi data.

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Table 2. Descriptive statistics for Iranian variables

Sign	Variable	Total mean	Std. dev.	Min	Max
$VAIC_{it}$	Intellectual capital	5.929	5.521	-13.119	44.384
$Blnd_{it}$	Board independence	0.732	0.172	0.000	1.000
$Bsize_{it}$	Board size	5.059	0.338	5.000	7.000
$CEO.Change_{it}$	CEO change	0.288	0.453	0.000	1.000
$CEO.Share_{it}$	CEO ownership	0.215	0.288	0.000	0.954
MTB_{it}	Book value to market equity of the firm	0.376	0.311	-3.286	1.906
$GCEO_{it}$	CEO gender	0.953	0.211	0.000	1.000
$Return_{it}$	Stock return	0.599	1.264	-0.663	9.234
$Loss_{it}$	Dummy variable of loss	0.126	0.332	0.000	1.000
$Size_{it}$	Firm size	14.200	1.518	10.533	19.150
LEV_{it}	Financial leverage	0.602	0.227	0.090	2.315
ROA_{it}	Return on assets	0.256	0.942	-16.846	0.631
ROE_{it}	Return on equity	0.256	0.942	-16.846	6.888
$Gross.Sale_{it}$	Sales growth	0.208	0.545	-0.845	7.705
Age_{it}	Firm age	38.031	12.806	10.000	65.000

Resource: the database of the study

Table 3. Descriptive statistics for Iraqi data

Sign	Variable	Total mean	Std. dev.	Min	Max
$VAIC_{it}$	Intellectual capital	5.974	15.266	-42.511	160.984
$Blnd_{it}$	Board independence	0.127	0.204	0.000	0.857
$Bsize_{it}$	Board size	8.428	3.288	5.000	21.000
$CEO.Change_{it}$	CEO change	0.632	0.483	0.000	1.000
$CEO.Share_{it}$	CEO ownership	1.828	23.052	0.000	304.136
MTB_{it}	Book value to market equity of the firm	0.661	1.154	-1.632	9.811
$GCEO_{it}$	CEO gender	0.926	0.263	0.000	1.000
$Return_{it}$	Stock return	-0.164	2.999	-13.394	18.883
$Loss_{it}$	Dummy variable of loss	0.365	0.483	0.000	1.000
$Size_{it}$	Firm size	22.375	1.312	19.256	26.298
LEV_{it}	Financial leverage	0.432	0.608	0.003	4.069
ROA_{it}	Return on assets	-0.039	0.318	-3.182	0.338
ROE_{it}	Return on equity	-0.171	3.024	-38.674	2.786
$Gross.Sale_{it}$	Sales growth	3.133	35.082	-5.506	459.783
Age_{it}	Firm age	31.457	13.314	11.000	70.000

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4.2. The Results of the Unit root Test of Variables

By analysing the unit root for the Iranian data, all variables are mostly at no unit root level (stationary). The obtained LM statistic for each variable is reported in Table 3-4. Only the variables of $VAIC_{it}$, SCE_{it}, $Return_{it}$, AGE_{it} are at the unit root level.

The obtained LM statistic for the unit root test of this variable rejects the null hypothesis concerning the absence of unit root at 99% probability level for $VAIC_{it}$, SCE_{it}, and AGE_{it} with 90% probability for the variable of $Return_{it}$. With one-time differentiation, the variables of $Return_{it}$ and AGE_{it} have no unit root. Moreover, the second-time distinction of the variables of $VAIC_{it}$ and SCE_{it} is also with no unit root.

All variables are mostly at no unit root level (stationary). The obtained LM statistic for each variable is reported in Table 4. Only the variables of SCE_{it}, CCE_{it}, $GCEO_{it}$, and Age_{it} are at the unit root level. The obtained LM statistic for this variable's unit root test rejects the null hypothesis concerning the absence of unit root at a 99% probability level. With one-time differentiation, the variables of $GCEO_{it}$ and AGE_{it} have no unit root. Moreover, the second-time distinction of the variables of CCE_{it} and SCE_{it} is also with no unit root.

Table 4. The results of the Hadri unit root test for the Iranian data

Variable	Level	First-order differentiation	Second-order differentiation	Variable	Level	First-order differentiation
$VAIC_{it}$	0.000	0.045	1.000	$GCEO_{it}$	0.996	
ROE_{it}	0.999			$Return_{it}$	0.803	0.999
$Gross.Sale_{it}$	0.953		0.999	$Loss_{it}$	0.915	
Age_{it}	0.000	0.425		$Size_{it}$	0.591	
$Blnd_{it}$	0.999			LEV_{it}	0.731	
$Bsize_{it}$	0.929			ROA_{it}	0.982	
$CEO.Change_{it}$	0.999			$CEO.Share_{it}$	0.853	
MTB_{it}	0.669					

Note: the null hypothesis is the absence of a unit root in variables. LM statistic is reported. ***, **, and * show the significance level at 99, 95, and 90%.

4.3. Inferential Statistics

Table 6 depicts the model results (1) estimation of Iranian and Iraqi firms' data. The first column of this table shows the name of contributing variables to the above dependent variables.

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Table 5. The results of the Hadari unit root test for the Iraqi data

Variable	Level	First-order differentiation	Second-order differentiation	Variable	Level	First-order differentiation
$VAIC_{it}$	0.995			$GCEO_{it}$	0.009	0.866
ROE_{it}	0.321			$Return_{it}$	0.997	
$Gross.Sale_{it}$	0.755		0.988	$Loss_{it}$	0.540	
Age_{it}	0.000	0.315	0.849	$Size_{it}$	0.278	
$Blnd_{it}$	0.461			LEV_{it}	0.598	
$Bsize_{it}$	0.293			ROA_{it}	0.528	
$CEO.Change_{it}$	0.887			$CEO.Share_{it}$	0.779	
MTB_{it}	0.994					

Note: the null hypothesis is the absence of a unit root in variables. LM statistic is reported. ***, **, and * show the significance level at 99, 95, and 90%.

Table 6: The results of model estimation for Iranian firms

Variable	Model (1) for the Iranian firms Coefficient (Standard error)	Model (1) for the Iraqi firms Coefficient (Standard error)
Constant	-51.550*** (17.239)	-7.444* (4.154)
BIndit	2.198*** (0.829)	-3.583** (1.416)
Bsizeit	-2.220** (1.246)	0.124** (0.066)
CEO Changeit	0.668* (0.472)	0.248 (0.395)
CEO_shareit	-1.279* (0.998)	-0.298* (0.216)
MTBit	-7.241*** (0.699)	-0.203 (0.218)
GCEOit	-0.639 (2.102)	-0.457 (0.454)
Returnit	-0.682*** (0.286)	0.093* (0.069)
Lossit	-1.102* (0.643)	-0.978** (0.492)
Sizeit	4.938*** (1.387)	0.522** (0.197)
LEVit	4.606*** (1.440)	-0.041 (0.260)
ROAit	8.178*** (2.706)	0.562 (0.485)
ROEit	0.626** (0.313)	0.011 (0.009)
Growth Salesit	0.344* (0.198)	0.012*** (0.001)
Ageit	-0.083 (0.242)	-0.056*** (0.021)
Adj. R-squared	0.2936	0.5095

Note: ***, **, and * show the significance level at 99, 95, and 90%. Resource: research findings

As can be seen in the table, the results of the robust model estimation are reported. In these models, panel data and four classic econometrics hypotheses are evaluated, and reliable results will be reported. These four hypotheses include collinearity among variables, exogeneity of descriptive variables, the variance of homogeneity, and the absence of serial autocorrelation among the disruptive components.

Given the applied regressions, the intercept of the Iranian firms is significant for all models. This model's intercept for Iranian and Iraqi firms is -51.5500 and 14.1920, respectively, significant at the 99% level.

Given the model estimation for Iranian and Iraqi firms, the effect of board independence (Blnd) on intellectual capital is positive for the Iranian data at a 95% confidence level. In contrast, the impact of board independence on intellectual capital is negative for Iraqi data at a 95% confidence level. By a 1% increase in board independence, the Iranian firms' intellectual capital increased by 2.1985%, and the intellectual capital of Iraqi firms decreased by -3.5828%.

The board size (Bsize) causes the decrease of intellectual capital in Iran and its increase in Iraq. For example, by a 1 % increase of Bsize variable, intellectual capital decreased at the 95% level for the Iranian firms by -2.2205% and increased by 0.1242% at the 95 % level for the Iraqi firms.

CEO change (CEO change) would increase Iran's intellectual capital but not affect the Iraqi firms. The coefficient of this variable in the model for Iran and Iraq is 0.6684 and 0.2479, respectively.

CEO gender (GCEO) does not affect Iranian and Iraqi firms' intellectual capital because its p-value for the Iranian and Iraqi firms is more than 5%, which shows no significant relationship between this variable and intellectual capital in both countries.

5. Conclusion

The present study is concerned about board independence, the board size, CEO gender, CEO change, CEO ownership, and companies' intellectual capital on the Stock Exchange in Iran and Iraq. The hypothesis testing results revealed a significant relationship between board independence and intellectual capital in companies listed in Iran and Iraq. This relationship is positive for Iranian firms. Still, it is negative and significant for the Iraqi firms. The results of the present study are in line with that of the Ku Ismail and Al-musalli (2012) declare that there is a significant and negative relationship between board independence and intellectual capital in Iraq and in contrast with that of the Attarita Dampitakseb and Panmanee (2017) who show that there is no relationship between board independence and intellectual capital. The reason for such a difference can be the economic status and dominant atmosphere in both countries.

Moreover, this study demonstrates that board size lowers the intellectual capital in Iran and increases Iraq. This means that by a 1 % increase of the variable, the intellectual capital will decrease for the Iranian and Iraqi firms, which are in line with the findings of Ku Ismail and Al-musalli (2012), who suggest that there is a negative and significant relationship between board size and intellectual capital and is in contrast with that of the Oba, Ibikunle and Damagum (2013), state that there is no relationship between board size and intellectual capital. On the other hand, the present study also analyses the relationship between CEO change and intellectual capital, showing no relationship between CEO change and intellectual capital efficiency in both countries. This means that CEO change does not contribute to the amount of intellectual capital in both countries. These results are in contrast with that of Ku Ismail, Abu Bakar and Al-Musalli (2016), who posit that there is a positive and significant relationship between CEO ownership and intellectual capital and are in line with that of Ku Ismail and Al-musalli (2012) and Oba, Ibikunle and Damagum.

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(2013) who declare that there is no relationship between these factors.

Finally, it is worth mentioning that this paper is about the relationship between CEO gender and intellectual capital. The hypothesis testing results show that CEO gender (GCEO) or the CEO's masculinity has no impact on both countries' intellectual capital efficiency. This finding is in contrast with the results of Ku Ismail, Abu Bakar and Al-Musalli (2016), Safieddine, Jamali and Noureddin (2009), who states that there is a significant relationship between CEO gender and intellectual capital and is in conformity with that of the Ku Ismail and Al-musalli (2012), who assert that there is no relationship between CEO gender and intellectual capital. Further, some variables, including CEO duality, financial expertise, and board and CEO industry, the data of which were not available in Iraq; we were obliged to omit them from the research model.

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Identifying the Factors Affecting Professional Turnover Intention among the Auditors

Kianoosh Ganji, Mohammad Arabmazar Yazdi

Department of Accounting, Faculty of Management and Accounting, Shahid Beheshti University, Tehran, Iran

Abstract

Professional turnover is a primary concern for the audit profession, as reported in many recent professional reports. Also, based on the official reports by Iranian authorities in 2019, the average retention period for Iranian auditors was 571 days which is too low compared to global statistics. Therefore, this study aims to identify the factors affecting professional turnover intention. In line with this goal, this research has been done using a qualitative meta-synthesis approach. The present study's data collection tools and information are past documents in this field, including 70 articles. The method of data analysis is based on open coding. The results indicate that the factors affecting professional turnover intention can be classified into seven general categories: individual factors, occupational factors, occupational and organizational attitudes, intra-organizational links, organizational climate, characteristics of audit firms and characteristics of the profession. In the end, based on the research findings, possible suggestions are given.

Keywords

Audit Profession, Turnover Intention, Employees Withdrawal, Meta-Synthesis

Corresponding author: Mohammad Arabmazar Yazdi
Email: *Marabmazar@sbu.ac.ir*

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1. Introduction

The economic orientation in recent decades has been that investment in human resources, information technology, research, development and advertisement has become an inevitable necessity to maintain a competitive position and ensure the growth and development of organizations. As competition increases, the capabilities of all resources, including the workforce, have changed and considering business environment changes, its value has also increased. These changes cause double pressure to improve the quality of the workforce (Izadinia and Masoumi Khaneghah, 2012). This is where maintaining a skilled and trained workforce can lead to the competitive advantage of related organizations (Taheri, Moradi and Jabbari Noghabi, 2017). But in many organizations and institutions, the existing employees want to leave the organization and their profession. Employee turnover in organizations and institutions is one of the most important concerns of human resource managers, which means separating the individual from the organization in which he works (Kerr, 2005). This issue is an important challenge in all organizations (Taheri, Z., Moradi, M. and Jabbari Noghabi, 2017).

Employee turnover disrupts the stability and continuity of the organization. Losing a good employee has a devastating effect on others and makes them demotivated and frustrated. As a result, it reduces productivity and job satisfaction in the organization. Because only the observed costs of employee turnover are considered, organizations underestimate the costs of employees' turnover, while the actual cost of this phenomenon is extreme. In addition to the direct costs (such as separation and replacement costs), a significant portion of the employee departures will be shown indirectly in the long run. These include the challenge of recruiting an efficient workforce, reducing organizational performance, reducing job satisfaction, other employees' perceptions of better job opportunities outside the organization, and declining employee morale, etc. (Gholipour, 2013).

One of the major problems that the audit profession faces is that auditors quit after a short period of employment in audit firms and before they can become members of the relevant professional community (Gertsson et al., 2017). According to the research results by Hiltebeitel and Leauby (2001), more than half of the people who had chosen audit as their profession have left the profession during the past three years, to which the audit profession in Iran is not an exception.

According to the information presented in the next section, the retention period in Iranian Audit Firms is 571 days (equivalent to one year and seven months), which is much lower than the three-year global average.

This amount of staff turnover poses challenges for audit firms and ultimately the audit profession because hiring and training new staff is costly (Chi et al., 2013), estimated by Hiltebeitel and Leauby (2001) at 150% of annual staff salaries. Also, because the organizational structure in audit firms is pyramidal and firms need more low-level staff than high-ranking staff, the departure of auditors and the recruitment of new auditors indicate a waste of time and imposition of the observed and latent costs (reducing in productivity) to audit firms (Rezazadeh, Rajabzadeh and Davani, 2008) and finally the audit profession.

In addition to the high cost that staff turnover imposes on audit firms, the inability to retain experienced and capable staff threatens the skills of audit teams, which makes audit quality vulnerable (Chi et al., 2013). Furthermore, due to the loss of expertise and the lack of specialized staff, firms are reluctant to accept some of their customers, earning less revenue (Taheri, Moradi and Jabbari Noghabi, 2017).

Despite the concerns of the regulators regarding the importance of retention of specialized staff in the profession (see paragraph 6 of Article 2 of the Guidelines for Certified Auditor of the Stock

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Exchange Organization and the questionnaire for controlling the status of audit firms in the Iranian Association of Certified Public Accountants), and the reports published in other countries regarding the significant challenge of retention of employees in the profession (Chi et al., 2013), no empirical and comprehensive research has been conducted on the factors affecting a turnover in the audit profession.

Considering the abovementioned items and the importance of the impact of auditors' turnover in the audit profession, this study's main issue will be what factors affect turnover intention among auditors in the audit profession.

2. Background and Literature Review

2.1. Audit Profession in Iran

Following the Islamic revolution in 1979, the nationalization program led to a significant decrease in the demand for services of private audit firms. Moreover, the amendment of the Tax Law in 1980 removed all acts that provided the basis for the operation of private auditors as Certified Public Accountants (CPAs). Three semi-state audit firms were established to conduct auditing of the newly nationalized firms: the Nationalized Industries and Plan Organization Audit Firm (1980); Mostazafan Foundation Audit Firm (1981); and Shahed Audit Firm (1983). The lack of comparability between the audited financial statements of the three audit firms led to legislation regarding the establishment of the Iranian Audit Organization ("IAO") in 1983. The IAO was founded in 1987 by merging the mentioned three semi-state audit firms (Mashayekhi and Mashayekh, 2008).

By 2001, IAO had dominated the Iranian audit market. In late 2001, "Using Services of Certified Public Accountants Act" ("USCPAA") was operationalized through the establishment of the Iranian Association of Certified Public Accountants ("IACPA") and following the operationalization of USCPAA, a large number of private audit firms registered as members of IACPA (Mohammadrezaei and Mohd-Saleh, 2017).

Based on the annual report of the Supreme Council of IACPA for the year ended in March 2021, there were 251 firms in which 10,059 employees were underemployment. Furthermore, in that year, Iran's audit market amounted to IRR 14,848 million (Equivalent to USD 65 million), which means that per capita revenue for each auditor in a month was IRR 123 million (Equivalent to USD 541)!

Among these 251 registered firms, only 64 audit firms (members of IACPA) and IAO are eligible to carry out audit work of the listed companies in the Tehran Stock Exchange and Iran Fara Bourse. These audit firms are labelled Certified Auditor of the Stock Exchange Organization ("CASEO"). CASEO is a firm that has passed the minimum quality requirements set by Stock Exchange Organization ("SEO").

There is no reliable method by IACPA to gather the necessary information regarding the employees in its members. Therefore, there is no information regarding the retention period for auditors who work with IACPA members. In contrast, CASEOs are required to upload their detailed information each semester, including contracts, working hours, employees' status and other requested information in the form of pre-determined forms in the Comprehensive Database of All Listed Companies ("Codal"). So inevitably, the information collected by the SEO is available for employees' status, which shows that after 2013, 7,690 people were employed and out of this number, 3,782 people left the audit profession by the end of 2019, as described in Table 1.

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Table 1: Departure and entrance statues for employees who worked in CASEOs

Organization level	2014	2015	2016	2017	2018	2019	Total
Assistant auditor	83	134	104	123	113	116	673
Auditor	238	299	299	406	447	490	2,179
Senior auditor	89	104	74	67	70	136	540
Supervisor	19	43	31	34	25	28	180
Senior Supervisor	18	18	13	23	10	6	88
Manager	3	5	8	10	5	7	38
Partner	11	9	12	16	19	17	84
Total departures (Hiring before 2013)	461	612	541	679	689	800	3,782
Total departures	1,087	1,066	807	957	898	967	5,782
Total entrances	2,350	1,416	1,264	954	890	816	7,690

As shown in Table 1, the departures were higher than the entrances last year, and it is alert for the profession. According to the employment information received from SEO, the average retention period of people who were hired after 2013 and left the audit profession by March 2019 in CASEOs was 571 days (equivalent to one year and seven months). Although 64 firms out of 251 firms are CASEO, at the end of 2019, 51% of employees were under CASEOs employment. It can be generalized that the retention period in Iranian Audit firms is [at least] 571 days.

2.2. Literature Review

Turnover intention is a conscious and measured desire to leave the organization (Chang., Wang. and Huang. 2013). Employees' turnover in any organization can be voluntary or involuntary. Voluntary turnover refers to the termination of a contract by employees. In contrast, in compulsory turnover, employees have no choice but to leave, resulting from long-term illness, immigration, retirement, and other issues raised by the employer. In most cases, voluntary turnover is a management problem that needs attention and is interpreted as employees leaving the organization when they are dissatisfied with their job, and there are alternative job opportunities (Hom and Kinincki, 2001). Thus, most studies have focused on voluntary turnover (Wright, 1993). In this study, the voluntary turnover of employees is considered and discussed, and the summary of related studies is presented as follows.

In qualitative research, Akrout and Damak Ayadi (2021) tried to enhance the understanding of the professional turnover intentions of accounting professionals by exploring their attitudes towards this phenomenon in Tunisia. They analyzed the data with a thematic coding method based on Push-Pull-Mooring (PPM) framework. In this study, four types of professionals were identified. They reported that the interconnection among PPM factors, which were different from one type of professionals to another, played a vital role in whether a professional intends to leave the accounting profession or not. All four types of professionals perceived unpleasant facets of the public practice environment (push factors) and manifested a tendency to switch to available job opportunities (pull factors). Nevertheless, the latitude for a profession change, for the third and the fourth types who perceived all professional experience differently, was restricted by mooring factors. That was not the case for the first type of professionals who had already left public accounting and the second type who intended to leave the profession, as they did not find any mooring factors.

Before them, Nouri and Parker (2020) reviewed and synthesized the extensive literature investigating turnover in public accounting firms. They classified prior turnover studies in psychological attachment, role theory, mentoring, expectancy theory and organizational justice.

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Although Nouri and Parker (2020) address a different issue (employee turnover within public accounting firms), we followed that paper in its structure of presenting prior works, and we cited the studies and the theoretical categories that suit our issue.

From the psychological attachment theory perspective, there is strong evidence that two main affective variables, namely commitment and satisfaction, are inversely associated with turnover intentions. Behavioural accounting scientists have studied the relationship between professional commitment and professional turnover intention in developed and developing contexts. Professional commitment, considered an attachment to the profession, is best conceptualized as a three-dimensional construct, consisting of the sub-dimensions of affective, continuance and normative commitment (Smith and Hall, 2008). Previous works conducted in both developed (Meixner and Bline, 1989; Smith and Hall, 2008) and developing (Ciftcioglu, Arsoy and Sipahi 2011) countries seem to agree on the existence of a negative link between affective commitment and professional turnover intention. Mixed results were achieved in accounting research conducted in both developed (Meixner and Bline, 1989; Dwyer, Welker and Friedberg 2000; Smith and Hall, 2008) and developing (Ciftcioglu, Arsoy and Sipahi 2011) countries regarding continuance and normative commitments.

Empirical results of accounting studies do not support the theoretical foundation concerning the link between professional satisfaction and professional turnover intention. According to Meixner and Bline (1989), it seems reasonable to expect that the studied relationship between the intention to leave and satisfaction in the organization can be generalized to the profession. They conducted an empirical study on accounting professionals and did not consider the direct negative effect of professional satisfaction on the intention to leave the profession. In the same vein, Schell and DeLuca (1991) performed a discriminant analysis to statistically distinguish between public accountants who remain in the public profession and those who leave it. The results showed that the more satisfied the professionals are, the more they are on the side of those who leave the public profession. Although this result may seem surprising, since the individual's satisfaction has no limits, it is considered that he/she is continually on the lookout for career development opportunities.

Another theory that could explain professional turnover intention is role theory, applied extensively in the organizational behaviour literature to investigate turnover in accounting firms. From the perspective of this theory, when an individual lacks clarity regarding the expectations of his role (role ambiguity) and faces conflicting situations (role conflict), he experiences role stress, which reduces job satisfaction, hence negatively impacting organizational turnover intention (Nouri and Parker, 2020). At the professional level, Collins and Killough (1992) propose a direct relationship between organizational stressors (role ambiguity, role conflict) and intention to leave the public accounting profession and confirm it.

Another presented category by Nouri and Parker (2020) was mentoring. A stream of accounting research examines how mentoring influences turnover intentions in public accounting firms using the survey method. This stream is borrowed extensively from the organizational behaviour literature. In an early and influential accounting study in this area, Viator and Scandura (1991) define a mentor as "an older, more experienced employee who advises, counsels and supports the career development of younger, less experienced employees (referred to as protégés)". In their survey of public accountants, Viator and Scandura (1991) report that having a mentor is associated with lower turnover intentions.

The professional turnover intention could also be explained by referring to the expectancy theory

(Nouri and Parker, 2020). According to this theory, individuals intend to stay in public accounting when they believe their current profession has higher expected rewards desirability than an alternative job outside the public practice. It is noteworthy that new generations are more and more inclined to explore the breadth of available opportunities. Indeed, young professionals practising in large public accounting firms focus on fast progress by exploiting the brand power of these firms and the authoritative expertise they gained to look for different opportunities in the corporate sector (ACCA, 2018).

Accounting researchers have investigated the relationship between other organizational issues and professional turnover intention. It has been shown that the training amount, the training helpfulness, the anxiety felt when performing tasks (Saks, 1996), and work experiences, such as work overload, advancement expectations and advancement aspirations (Greenhaus et al. 1997), are significant determinants of the intention to leave public accounting.

Furthermore, several studies (Collins and Killough, 1992; Greenhaus et al. 1997; Greenhaus, Parasuraman and Collins (2001) investigated the effect of work-family conflict on the intention to leave the public accounting profession. It is also worth noting that with the current change of the career expectations between generations, it is challenging for accounting firms to meet the expectations of new generations that are more open to change in professions, hence higher turnover rates (Akrout and Damak Ayadi, 2021), and look for work flexibility and adequate work/life balance (Durocher, Bujaki and Brouard 2016).

Gender has also been the subject of extensive research in accounting studies highlighting women's difficulties in practising the public accounting profession. For instance, Greenhaus et al. (1997) found a significant difference between men and women in their survival in this profession. Their results indicated that women are more likely to leave public accounting than men. Gender explained 2% of the variance in the departure from public accounting when control variables, such as the area of specialization within accounting, the firm size and the number of years as a CPA, are added to the model. Besides, Knechel et al. (2019) found that females are more likely to leave the audit profession.

Since none of the previous studies has presented a comprehensive model to show what factors, in which levels can influence turnover intention in the audit profession, this study aimed to know what factors affect turnover intention in the audit profession.

3. Research Methodology

The present research is a qualitative meta-synthesis study. Meta-synthesis integrates several studies to provide comprehensive and interpretable findings (Nye, Melendez-Torres and Bonell, 2006). The strength of meta-synthesis is its ability to identify common themes and build a conceptual framework extracted from literature. In other words, meta-synthesis is qualitative research that reviews extracted information and findings in other studies with similar and relative topics. Therefore, samples are selected among highlighted studies due to their relations with the research question (Zimmer, 2006). To achieve the research purposes, we use the seven-step Sandelowski and Barroso (2007) method, the most prominent one for performing meta-synthesis and providing better results than other models.

3.1. First Step: Determining the Research Question

Following the determination of the primary purpose of the meta-synthesis study, one should decide on the preliminary topical (what), population (who), temporal (when), and methodological (How) parameters of the study (Sandelowski & Barroso, 2007). In this study, the preceding

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question on “what” is answered and factors affecting turnover intention in the audit profession are identified. The next question is on “who” led to the inclusion of certain databases and journals. The question on “when” determines the time interval of the reviewed papers, which included articles available on local and international online archives and the studies conducted from 1977 to 2020 in this research.

The final question pertains to “how " reflecting the method used to collect the research data. This was performed by applying scientific methods (qualitative, quantitative, and mixed methods) on turnover intention. In this regard, the research questions for the next step of meta-synthesis are as follows:

- What are the factors affecting turnover intention in the audit profession, and how are these factors grouped?

3.2. Second Step: Systematic Exploration of Resources

To implement the systematic review and meta-synthesis in this study, the defined keywords (Table 2) were searched [individually or together] in online databases of local and international journals,[1] where 21 Persian articles and 118 English articles were found.

Table 2. Keywords for search

Keywords	
Turnover intention	Quit, Exit
Switch	Change
Persistence	retention
Departure	Withdrawal

3.3. Third step: searching and selecting the right texts

In this study, after several reviews and the refinement of the papers, a number of sources were rejected and excluded from the meta-synthesis. The refinement and review process is briefly outlined in Figure 1 based on the Critical Appraisal Skills Program (CASP), a method with which the researcher can systematically assess the trustworthiness, relevance, and results of the published papers (Dianati, 2019).

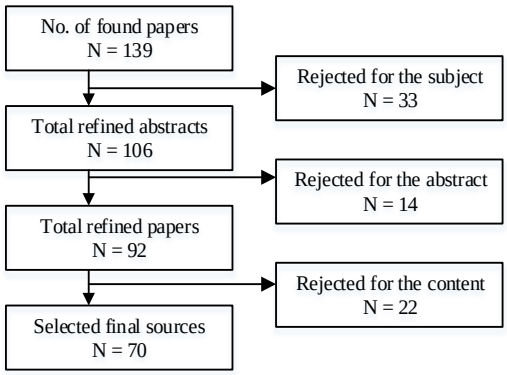

Figure 1. Refinement procedure for paper selection

[1] In this study, we have reviewed valid international journals in Accounting and Auditing. Based on the last published list of JCR journals, active journals (Q1, Q2, Q3, and Q4) in accounting and auditing are selected and reviewed.

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3.4. Fourth step: Extracting Information from the Sources

Following paper selection, MAXQDA has been used to extract the codes from the selected papers. For this purpose, all of the factors extracted from the studies are first considered as open codes. Then, considering the meaning of each of these codes, they are classified in similar senses, which is presented in table 3.

3.5. Fifth Step: Analysis and Synthesis of the Findings from Studies

Table 3. Sources and frequency of Themes, Concepts and Codes

Theme	Concept (frequency from 408)	Code	Source[1]
Organizational climate	Perceived justice (16)	External justice	[64]
		Interactional justice	[42] / [69]/ [64]
		Procedural justice	[2]/[81] /[43] /[82]/[3] / [40] /[13] /[50]/ [46]/ [42]
		Distributive justice	[82]/ [42]
	Knowledge sharing (5)	Auditors training	[99]/ [59]/ [29]
		Training effectiveness	[76]
		Organizational knowledge	[37]
	Perceived organizational support from the firm(23)	Job Security	[99]
		Work-life balance	[8]/[83]/ [2]/[50]/ [40]/ [11]/[79]/ [42]
		Alternative work arrangement	[69]/[83]/ [2]/[79]
		Appreciation of employees for their performances	[99]/[13]
		Received respect at work	[95]/[96]
		Considering employees personal goals	[14]
		Taking care of employees well-being	[14]
		Received salary	[17]/ [48]
		Preparing good working conditions	[87]
	Organizational culture (9)	Professionalism	[100]
		Organizational trust	[61]/[94]
		Free Expression	[99]/[7]
		Ethical climate	[69]
		Stereotypical masculine	[9]/ [67]
		Perceived environmental uncertainty	[94]
	career growth opportunities (6)	Perception of job's success in preparing for career goals	[13]
		Presence of growth opportunities	[99]/ [95]/[96] /[76]/ [61]
Intra-organizational link	Supervisory factors (17)	Satisfaction with supervisory	[13]/ [37]
		Guidance	[87]/ [20]
		work assignments	[25]/[83]/[13]/[18] / [47] /[81]/ [87]
		Received support from supervisors	[87]/ [23]/ [98] / [69]/ [59]/ [15]
	Interaction with	Support from colleagues	[59]/ [47]

[1] To save the space in this article, all the references are numbered at the end of the article and rather than mentioning the reserachers' names and the years in the table, the numbers of the articles are presented here.

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		colleagues(7)	Social interaction	[37] / [40]
			Interaction with desirable colleagues	[47]
			Satisfaction with interactions colleagues and supervisors	[13]/[32]
		Characteristics of the team (6)	How well cooperate in the team	[7]
			Presence of a same-gender in the team	[69]
			Team building	[20]
			Connectors in group	[7]
			Group experience	[7]
			Team size	[7]
		Mentoring (26)	Presence of mentors	[25]/ [46]/ [90]/ [101]/ [40]/[97]/ [49]/ [10]
			Gender of mentors	[90]/ [10]
			Mentor's availability	[101]/[79]
			Mentor's position	[90]
			Interaction between a protégé and a mentor	[90]/ [49]/ [10]
			Mentoring performance	[40]/ [15]/ [49]/ [10]/ [37]/ [61] / [101] / [90]/ [46]
		Feedback (5)	Satisfaction with the feedback received	[4]
			Unfavourable Supervisory Feedback	[25]
			Feedback source	[4]
			Feedback sign	[4]
			In-group and out-group feedback	[4]
	Occupational factors	Job Design (13)	Performance evaluation	[13]/ [40]
			Passing professional exams	[50]
			Job fitness with educational degree	[17]
			Deadline based job	[50]
			Job autonomy	[8]/ [40]/ [36]
			Varied work assignments	[47]/ [40]/ [36]
			Technology	[34]
			Task identity	[36]
			Job-related tension	[18]/[94]
			Stress arousal	[96]/[94]
		Work pressure (10)	Satisfaction with work pressure	[13]
			Overtime	[47]/[94]
			workloads during the internship	[47]
			Working hours	[40] /[18]
		Role strain (34)	Role stress	[59]/ [38]/ [2]/ [40]/ [34]/ [64]/ [48]
			Role conflict	[59]/ [38]/ [2]/ [95]/ [64]/[86]/[18]/[96]/ [56]/[94]
			Role overload	[38]/ [2]/ [95]/[86]/[96]/ [56]
			Role ambiguity	[59]/ [25]/ [38]/ [2]/ [27]/ [57]/ [95]/[18]/[96]/ [56]/[94]
	Occupational / Organizational attitude	Usefulness perception at work (6)	Importance of the person for the firm	[14]/ [95]/[96]
			Recognition of the person in the firm	[95]/[96]
			Sense of meaning	[40]
		Values	Professional-Organizational conflict	[100]/ [8]/[32]

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Congruence (4)	Values congruence between individual and organizational goals and values	[37]
Job satisfaction (43)	Satisfaction with the current situation at work	[100]/ [87]/ [99]/ [59]/ [8]/ [25]/ [4]/[83]/ [38]/ [2]/ [46]/[81]/[13]/ [67]/[28]/ [57]/ [95]/ [34]/[32]/[43]/ [75]/[86]/ [49]/[18]/[96]/ [56]/[94]/ [36]/ [98]/ [48]
	Satisfaction with firm policies	[40]
	Satisfaction with office support	[13]
	Satisfaction with received salary	[99]/[13]/[32]
	Organizational pride	[40]
	Satisfaction with work itself	[13]
	Fun at work	[7]
	Interested in the job	[57]
	Enjoyment from job	[57]/ [34]
	Compliance with the ideal job	[25]/[83]
	Satisfying basic needs with working	[59]
Perceived identity (4)	Shared identity	[7]
	Organizational identity	[8]
	Professional identity	[8]
	Social identity	[4]
Expectations from the job(4)	Perceptions of the profession	[40]
	Met expectations	[40]
	Pre-employment expectations	[47]/[79]
Commitment (40)	Job involvement	[15]
	Affective commitment	[74]/ [46]/ [57]/[97]/ [63]/[97]
	Normative commitment	[74]/[97]
	Continues commitment	[74]/ [57]/ [63]/[97]
	Organizational commitment	[100]/ [99]/ [74]/ [51]/ [66]/ [14]/ [25]/ [29]/[50]/ [47]/[81]/[97]/[97]/ [34]/[32]/ [15]/[86]/ [76]/[18]/ [61]/[94]/ [36]
	Professional commitment	[100]/ [74]/ [66]/ [47]/[32]
Locus of control (2)	External locus of control	[29]
	Internal locus of control	[94]
Burnout(26)	Perceived burnout	[51]/ [14]/ [38]/ [2]/[50]/ [95]/[18]/ [56]/[94]
	Decrease in personal accomplishment feelings	[38]/ [29]/ [2]/ [95]/[18]/[96]
	Depersonalization	[38]/ [2]/ [95]/[18]/[96]

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		Emotional exhaustion	[38]/ [2]/[50]/ [95]/[18]/[96]
Characteristic of the profession	Audit market (5)	High demands for audit Audit importance Competition in the audit market	[100]/[50] [40]/ [36] [23]
	Enforcement by the regulator (1)	Regulator enforcement style	[66]
Individual factors	Length of service (21)	Internship experience	[47]
		Organizational level	[90]/[13]/ [40]/ [95]/ [34]/ [75]/ [49]/ [10] /[28]/[43] /[100]
		Expertise	[40]
		Experience	[100]/ [9]/ [8]/ [40]/ [57]/ [34]/[32]/ [48]
	Demographic variables (39)	Presence of children in the household	[79]
		Marital status	[95]/ [34]/ [48]
		Physical appearance	[64]
		Gender	[69]/ [9]/ [8]/[83]/ [38]/ [90]/ [67]/[28]/ [40]/ [95]/ [34]/Fogarty (1996)/ [64]/[43]/ [11]/ [75]/ [17]/[86]/ [49]/ [48]
		Education	[95]/[32]/ [17]/ [48]
		Ethnicity	[101]/[28]/[32]/[43]/ [75]/ [48]
		Age	[95]/ [34]/ [64]/ [48]
	lifestyle preferences (12)	Life style	[11]/[12] / [56]
		Personality type	[28]/[43]/ [75]/[94]
		Hardiness	[63] /[94]
		Physical health	[94]
		Psychological well-being	[56]
		Vitality	[56]
Characteristics of Audit Firms	Available job opportunities(3)	Available job opportunities	[8]/[13]/ [49]
	Audit firm structure (6)	Private or related to the Government	[9]/[28]/[43]
		Audit process structure	[66]
		Boundary spanning activity	[94]
		presence of same-gender on managerial level	[69]
	Audit firm credibility (14)	Recommendation of the firm to others	[25]/[83]
		Firm size	[87]/ [9]/ [40]/[32]/ [49]
		Audit quality	[99]/ [8]
		litigation between the firm and clients	[23]
		Other auditors attitudes regarding the firm	[99]/ [8]
		Firm rank	[99] / [76]

3.6. Sixth Step: quality Control

Since the factors in previous studies have been assumed as codes that have been classified and merged into concepts, the Kappa index has been used to test the reliability of the designed model and control the quality. So, another person among the audit profession experts familiar with the organizational behaviour concepts classified the codes and concepts. After that, the extracted concepts by researchers have been compared with the expert's concepts. Finally, due to the similar and different extracted concepts, the Kappa index has been calculated at 0.6921, a more than acceptable value (0.6) (Jensen and Allen, 1996). Therefore, code extraction has good reliability.

3.7. Seventh Step: Findings

In this step, the results of prior studies analysis have been presented in Figure 2. The presented model in this study is a consensus of previous studies in a single set that provides a comprehensive view of turnover intention in the audit profession.

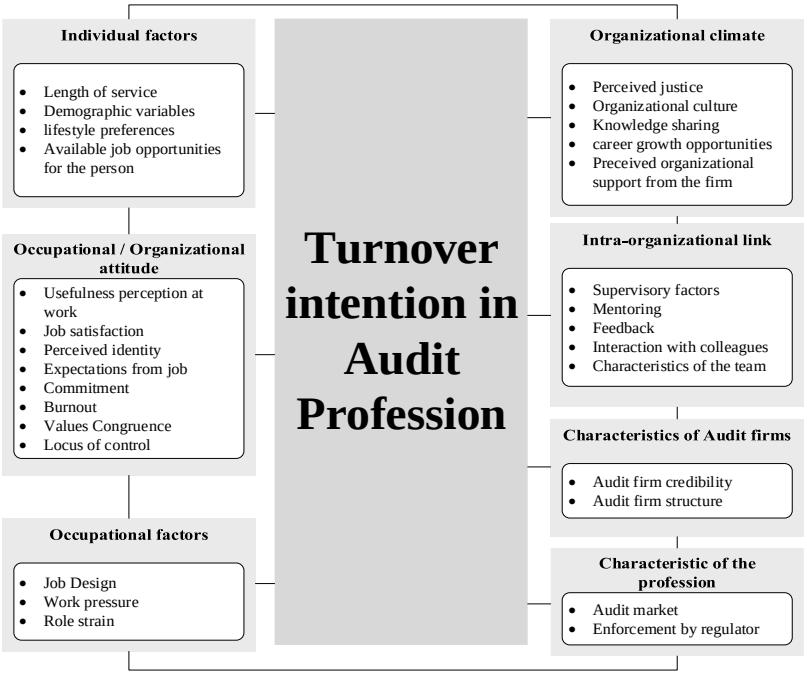

Figure 2: Final Model

4. Discussion and Conclusion

The present study aimed to identify the factors affecting the auditors' turnover intention in the audit profession. In this regard, available studies in the online archive of the journals from 1977 to 2020 were examined using the meta-synthesis method for the first time. In this way, 139 types of research were found, and finally, 70 related types of research were selected as the source of the analysis. After the analysis using MAXQDA software, 135 distinct codes were identified. The identified codes formed 29 concepts at a higher level, and finally, the concepts were classified at a higher level into 7 categories, namely individual factors, occupational/organizational attitude, occupational factors, organizational climate, intra-organizational links, Characteristics of Audit firms and Characteristic of the profession. According to Table 3, the highest frequency of research was in occupational/organizational attitudes, and the lowest attention of researchers was paid to the

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characteristics of the profession. Some of the factors that have been most prevalent in previous researches are described in the following section.

Occupational/Organizational Attitudes: Attitude refers to a set of beliefs, emotions, and behavioural intentions toward an object, person, or event. A relatively stable desire for a person, thing, or event manifests itself in feelings and behaviour (Gholipour, 2007). Job attitude includes job satisfaction and commitment (Malekzadeh, Rahimnia and Goli, 2016), and the closeness of burnout to this concept is classified in this concept.

Job Satisfaction: Job satisfaction means "a pleasant emotional or positive state resulting from the evaluation of a job or the experiences resulting from it" and studies in applied psychology and organizational behaviour consistently show an important reverse relationship between job satisfaction and turnover intention among employees.

Commitment: Commitment is a relationship between an employee and the organization or profession in which he/she works, which can be defined in two levels of organization or profession. Although there are different concepts of commitment in the research literature, affective commitment is the most related concept to turnover intention in the audit profession. Affective commitment includes accepting the goals and values of the organization, the willingness to apply efforts that benefit the entire organization, and the desire to membership in the organization (Porter et al. 1974).

Burnout: Burnout, in particular, is a useful mediating variable in understanding the effect of job stressors on the turnover intentions among employees. Burnout structures include three interdependent dimensions: emotional exhaustion, depersonalization (behaviour with others as objects), and loss of belief in personal accomplishment (Smith, Emerson and Everly, 2017).

Individual Factors: Since audit firms are service-oriented businesses and provide services through individuals at different levels, individuals and their characteristics need a lot of attention. The most important individual factors mentioned in previous studies are demographic factors, length of service and lifestyle preferences:

Demographic Factors: The most important and frequent demographic factors studied by researchers are gender and ethnicity. Researchers have alternately reported that women's departure rates are much higher than men's departure rates in the audit profession (Nouri and Parker, 2020). This is even though, although half of all newcomers to audit firms in the United States are women, the percentage of female partners in audit firms is much lower (Dalton et al., 2014). According to the statistics published by the Iranian Institute of Higher Education Research and Planning, from 1996 to 2014, 230,135 people graduated in accounting In Iran, out of which 110,770 (about 49%) were women. On the other hand, according to the statistics reported by the Audit and Financial Reporting Department of the SEO at the end of 2014, out of 4300 auditors were working in CASEO, only 1,052 (about 25%) were female auditors. And Of these female auditors working in the firms, only 35 have been able to obtain the job category of partnership or management in Audit firms (Mehrani, Nargesian and Ganji, 2016). Therefore, in Iran, because a more or less equal number of men and women graduate in accounting and enter the audit profession, too few of these women remain in the profession.

After gender, previous researchers have paid special attention to ethnicity and race. For instance, Glover, Mynatt and Schroeder (2000) sought to answer why, depending on the African-American population in the society and university graduates, they were the minority in the audit profession and did not progress in proportion to their population in the society. They examined the personality, job satisfaction and turnover intention among African-American auditors. According to their

research results, the lack of African-American advancement in the audit profession stems from a low commitment to racial diversity in the profession and the existence of a glass ceiling in firms.

Length of Service: Another factor affecting the employees' turnover intention in the audit profession is the organizational level of the person in the organizational hierarchy. According to Baker's theory, the more an individual invests in an organization, the more commitment he will have towards that organization, and the higher the level of commitment, the lower the turnover intention (Tehrani, Ghazi and Khalife 2005).

Lifestyle Preferences: Personality type is one of the factors that determine lifestyle preferences. Personality is defined as "the set of perceptions, cognitions, feelings, and motivations of individuals that determine individuals' unique responses to the environment." The relationship between personality and success in jobs has been the subject of many studies over the years, and its research literature is being formed on the subject of auditors' personality traits (Dole and Schroeder, 2001).

One aspect of personality is how people tend to manage their daily activities. In this regard, researchers have conducted studies on the relationships between personality types and turnover intention. These studies have mainly reported that the type A personality is more appropriate for the audit profession (Mynatt et al. 1997; Glover, Mynatt and Shroeder, 2000; Dole and Schroeder, 2001; Smith, Derrick and Koval, 2010).

Intra-organizational Links: The audit profession is based on teamwork and interaction between individuals. Therefore, some of the factors affecting turnover intention from the audit profession can be classified into the relationships that people have with each other within the firm.

Mentoring: A stream of studies conducted in the audit profession uses surveys to examine how mentoring affects turnover intention. This trend owes much to the existing literature on organizational behaviour. In one of the pioneer studies in this field, Viator and Scandura (1991) defined the mentor as "an older, more experienced employee who advises younger and less experienced people and supports them during their careers" (the people under support and education are called protégés).

Supervisory Factors: In the fall of 1993, the Commission for Change in Accounting Training, in its Statement No. 4, advised the supervisors of audit firms to pay attention to three important actions in order to improve the job satisfaction of novice auditors: 1. Guidance 2. Providing appropriate working conditions 3. Work assignments (Rezazadeh, Rajabzadeh and Davani, 2008), whose relationship with job satisfaction and auditors turnover intention in audit research has been proven.

Organizational Climate: According to the research results, organizational climate can affect the members' behaviour in the organization. Organizational climate is a set of work environment criteria directly and indirectly understood by people who work in this environment and affect their motivation and behaviour (Shaemi, Shabani and Khazaei, 2014).

Perceived Organizational Support from the Firm: According to the organizational support theory, the generalized feelings and beliefs of individuals are in the way that the organization values , assist, and support all its members and is concerned about their happiness, future and well-being. Based on this feeling, employees in the organization will feel satisfied. Given that managers are the representatives of organizations, employees tend to consider the support of leaders as support for the organization, and the lack of such support will cause dissatisfaction with the organization (Mehrani, Nargesian and Ganji, 2016).

Perceived Justice: Organizational justice refers to employment conditions that expose people to fair or unfair treatment. The long-term flow of research in applied management and psychology, including hundreds of studies, has shown that justice affects employee turnover (Nouri and Parker,

2020). Accounting researchers have also examined the effects of justice in dimensions such as distributive justice, procedural justice, interactive justice and external justice.

Occupational Factors: Occupational factors are job-related features affecting the employees' retention in that job. Everyone has personality and mental characteristics that should be compatible with the job. If this relationship exists between the job and the person, they will be satisfied with the job, and therefore will not be looking for another job. Like many other professions, auditing has its own characteristics. In addition to the need for professional qualifications, deadline basis and continuous performance appraisal, accounting researchers have addressed a wide range of concepts of role theory in organizational behaviour in their studies of turnover in audit firms. Nouri and Parker (2020) mention individuals in an organization have the expected plans for their work. When people are ambiguous about their expectations (role ambiguity) or when they experience conflicts about role expectations (role conflict), they experience role stress, reducing job satisfaction. Researchers in organizational behaviour has introduced the next concept of job overload - the necessity to do a very large amount of work and tasks in the limited time available - (Nouri and Parker, 2020).

Based on the frequencies presented in Table 3, researchers have less emphasis on variables in the level of characteristics of audit firms and the profession, among which the research of Martinow, Moroney and Harding (2020) can be referred to. They examined the regulator enforcement style on turnover intention. Some other studies have found that firms' credibility, including the size and rank of the firm and other auditors' attitudes toward the firm, have shaped turnover intention in the audit profession.

A literature review in this field indicated that previous researchers selectively examined the relationship between some variables and the auditors' turnover intention. In contrast, the factors affecting turnover intention have not been identified or explained so comprehensively in none of them. Therefore, the results of this study include all the factors extracted from the studies and are consistent with other studies in this regard. On the other hand, the present study provides a more comprehensive model than previous studies with new analysis and classification. According to the findings of the present study, the factors affecting the auditors' turnover intention include individual factors, Occupational / Organizational attitude, Occupational factors, intra-organizational links, organizational climate, characteristics of the audit firm and characteristics of the audit profession and presenting these categories are among the contributions of the present study.

Most studies examine turnover in the USA; however, a significant number investigate turnover in other countries, including Iran (Taheri, Moradi and Jabbari Noghabi, 2017; (Rezazadeh, RAJABZADEh and DAVANI, 2008), Australia (Herbohn, 2004); Canada (Lachman and Aranya, 1986); Hong Kong (Law, 2010); Ireland (Barker, Monks and Buckley 1999); Singapore (Aryee, Wyatt, and Min (1991); Sweden (Gertsson et al. 2017); Taiwan (Chow et al.,2002); and UK (Gammie and Whiting, 2013). In general, results seem consistent across these countries. However, national culture may have some role in turnover. For example, Chow et al. (2002) argue that the national culture of Taiwan differs significantly from that of the USA. This has consequences for the relation between person-organization fit and turnover in accounting firms in Taiwan. Therefore, the results of this study should be generalized considering the incumbent culture in the country.

Regarding future research, we suggest conducting qualitative research in Iran to understand the reasons behind professional turnover intention among Iranian auditors. Furthermore, we have additional suggestions that do not fit easily into the research streams previously discussed in this literature review. For example, the authors propose that accounting researchers should reconsider

turnover from the firm's perspective. The vast majority of prior studies argue that turnover is harmful to the firms as the firm expends considerable resources on training the departing employees. While the cost of training is an undeniable loss to the firm, other potential consequences, some of which are beneficial, may also occur. Recent studies in management and organizational behaviour that explore the relation between turnover and organizational performance may be relevant to this issue. As noted in the meta-analysis by Park and Shaw (2013), there are several theoretical perspectives within this research stream. According to the human capital approach, any turnover of experienced employees with advanced knowledge and skills damages the firm performance. Replacement employees will not be as effective until they gain experience. Further, recruiting and training replacement employees is costly. Most studies of turnover in public accounting firms implicitly adopt this perspective. As Park and Shaw (2013, p. 269) note, an alternative approach, the cost benefit approach, is more complex and nuanced. While high turnover is disruptive and reduces firm performance, low levels of turnover may be beneficial "by reducing compensation costs, revitalizing the workforce and sorting out poor performers"; consequently, companies should strive for an optimal turnover rate that is neither excessive nor too low (Park and Shaw, 2013).

Finally, regarding future researches, we note recent changes in the workplace at public accounting firms, such as remote work and the rise of the millennial. Because of advancements in software and electronic communications, employees now have the ability to do many tasks from remote locations such as a home. This may improve the quality of life for auditors as this provides greater work flexibility and reduces travel time to clients as fewer client visits are required (Pintabone and Caruso, 2018). The opportunity to work remotely and spend less time commuting may be particularly advantageous for employees trying to juggle the demands of a career and raise young children. Finally, much in the business literature has been written about a younger generation (often called millennials) who may differ in certain ways from previous generational cohorts (Firfiray and Mayo, 2017). The US Chairman of PricewaterhouseCoopers noted that this newest generation wants a greater work-life balance; consequently, retaining staff is more challenging than in previous eras (Moritz, 2014).

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The Relationship between Market Value, Capital Expenditures, Value Creation and Product Market Power

Arash Arianpoor

Department of Accounting, Attar Institute of Higher Education, Mashhad, Iran

Saleh Orfizadeh

Economics and Administrative Sciences, Shahrood Branch, Islamic Azad University, Shahrood, Iran

Abstract

The present study's primary purpose is to investigate the relationship between the company's market value, capital expenditures, value creation, and the product market power of the companies listed on the Tehran Stock Exchange. The study's statistical population consists of 129 companies during 2013-2018. The Combined data method has been used to test the research hypotheses. The Herfindahl–Hirschman, the Lerner, and the Industry-adjusted Lerner Index measure product market power. To measure the company's market value, Maditinos et al. (2011) were used to measure capital expenditures. The model presented in Liao, Lin and Lin, (2016) has been used, and the Pulic Model (2004) to measure value creation. The results show a positive (negative) correlation between the market value of the company and the Herfindahl–Hirschman Index and Lerner Index (Industry-adjusted Lerner Index). There is a positive (negative) correlation between capital expenditure and the Herfindahl–Hirschman index and Lerner Index (Industry-adjusted Lerner Index). The results show a negative (positive) correlation between value creation and the Herfindahl–Hirschman Index (Lerner Index and Industry-adjusted Lerner Index).

Keywords

Market Value, Capital Expenditures, Value Creation, Product-Market Power

Corresponding author: Arash Arianpoor
Email: *arash.arianpoor@attar.ac.ir*

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1. Introduction

One of the most important financial reporting goals is to provide useful information for appropriate decisions to succeed in competitive areas, including business, politics, and economics. The power of the product market is a critical criterion for assessing the quality of industries and firms in competitive fields (Baggs and Bettignies, 2007). The use of profitably competitive investment opportunities leads to selecting the most beneficial strategies, leading to a more efficient allocation of scarce resources and, finally, the enhancement of organisational performance (Rostami and Rezaei, 2021). Competitive pressure is an important determinant of managerial decision-making that has received empirical support in the literature (Datta, Iskandar-Datta and Singh, 2013). Considering the importance of increasing the strength of companies in the market of manufactured products, recognising the variables affecting the power of the company is very important (Jaspersen, 2016), which is considered as one of the essential industry attributes in explaining the fluctuation of corporate profits and the uncertainty of information identified (Haw and Lee, 2015). Peress (2010) states that large companies' power in the product market causes investors' business activities and uses accounting information through information reported in financial statements to predict future cash flows and profitability. On the other hand, the company's market value reflects the shareholders' wealth since the accounting system's final result is office value. Suppose the accounting measurements are carried out so that the office value is the same as the market value. In that case, other financial analysts do not need the accounting variables such as profit and cash flows. But in accounting measurements, the market value is not the same as a company's office value (Pirie and Smith, 2008). Jaspersen (2016) states that the company's market value is one of the criteria for the company's performance in the balanced assessment approach, so it's a prediction for investors and managers, and assessing the market power of the product is very important. Competition is a disciplinary device that motivates managers to stay in business efficiently (Alchian, 1950; Stigler, 1958; Shcimidt, 1997) and focusing on competition intensity and flexibility level can deal with the board’s ambiguities on market structure and competitive status (Rostami and Rezaei, 2021). The threat of failure and liquidation reduces agency costs and incentivises managers to make value-increasing decisions (Grossman and Hart, 1992). Thus, product market competition forces powerful managers to use their powers, and when markets are less competitive, they have no incentives to make more effort. CEOs prefer to have a quiet life and are more likely to misuse their powers to extract personal rents, reducing value. Hart (1983) shows that competition in product markets provides incentives to managers to reduce managerial slack. Moreover, heightened competition increases the likelihood of failure for high-cost firms (Schmidt, 1997), and it can discourage managers from investing in risky investments (Salehi, Daemi and Akbari, 2020). However, there is not much room for costly mistakes in competitive product markets, and the threat of liquidation forces managers to make decisions for value increase (Grossman and Hart, 1992).

In Iran, creating a competitive environment and eliminating monopolies are among the controversial categories of Iran's economy, and after the implementation of No. 44 of the Constitution on privatisation and the relative change of government approach to the economy, the ownership structure of companies has changed somewhat and provided for the private sector to enter many areas of activity. The monopolies in the hands of the government in some industries have decreased, and the conditions have been prepared for the competitiveness of other industries. However, there are still restrictions and barriers to competing in products in some Iranian industries, and companies face unfair competition with state-owned- enterprises.

Another factor in the strength of the product market is capital expenditure. Since the quality and the product market power are the bases for a firm to make profits and create value, product market

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status may be an essential predecessor of capital expenditures (Liao, Lin and Lin, 2016). The results of Farooq and Pashayev (2020) also highlights the importance of product market competition on the expenditure in the emerging market, where agency problems are supposed to be high.

Further, the essential respect for the customer and the increasing market power is value creation. Value creation is an approach that an organisation takes to all its users, especially its customers. The customer focuses on all processes and activities and manages the organisation to address all the eliminator demands and customer needs (Johnson, 2002). Firms can achieve sales growth by strategically emphasising value creation or value appropriation activities. However, surprisingly little is known about the impact of pursuing these activities with internal resources and via strategic international alliances (Tower, Hewett and Saboo, 2021). Several studies (such as Akdogu and MacKay, 2012; Datta, Iskandar-Datta, and Sharma, 2011; Haushalter et al., Haushalter, Klasa and Maxwell, 2007; Fama, 1980) reveal that a firm's product market competition environment influences its investments and financing. Yet, how a firm's market value, Capital expenditure, and value creation affect product market power is an issue that has largely been overlooked. Therefore, the current study examines the relationship between the company's market value and capital expenditures and value creation on the product's market power.

The study has several contributions. First, to our knowledge, this is the first study investigating the relationship between the company's market value and capital expenditures and value creation on the product's market power. On the other hand, methods of measuring product market competition are always challenged. So, in this study, the Herfindahl – Hirschman Index (HHI), Lerner Index (LI), and industry-adjusted Lerner Index (LIIA) were used to measure product market competition. This research can be an effective step to understanding and motivating managers and investors to pay attention to the importance of product market competition and corporate investment. This study also provides empirical evidence of how a company's market value, capital expenditures, and value creation can affect product market competition. The findings of this study can show the importance and necessity of this research and fill the research gap in this field. This study can provide new evidence of the Iranian environment, enrich the relevant literature, and offer a relevant contribution to academic researchers in investment decisions.

The second part presents the theoretical foundations and background of the research and this research method. In the next section, the research findings are presented, and, finally, the discussion and conclusion are expressed.

2. Literature Review and Hypothesis Development

2.1. Product Market Power

Economic development has become one of the main goals of countries' economic policies and decisions, and efficient investment affects sustainable economic growth and development (Hall and Lerner, 2010). On the other hand, competitiveness is a central issue worldwide, referred to as achieving optimal economic growth and sustainable development. One of the characteristics of a successful company is having competitive power, and the obvious feature of unsuccessful companies is not having this power. Market competition is an effective factor in companies' investment and financial performance, and market competitiveness can lead to increased investment and business efficiency and affect the market value of companies and agency costs (Nugroho and Stoffers, 2020). Given the information role of the competitive environment, it seems that a strong competitive environment improves the oversight of management decisions about investment and its efficiency and creates an effective culture of corporate governance. This can be done by increasing

the efficiency of managers, increasing transparency in decision making, improving the level of accountability of managers, reducing the risk of incorrect investment decisions, and realising the prices in the market (Paniagua, Rivelles and Sapena, 2018). Shepherd (1970) defines the product's market power as the company's ability to determine the quality, price, and nature of the product in the market. He argued that the product's market power further implies that the company will face less competitive threats. The growing competitive conditions are for companies with little market power. In other words, when a customer leaves a demand for different companies in a particular industry and stops buying from a company and closes the relationship with another company, the company first benefits the second company's market for its product Loses (Irvine and Pontiff, 2009). Competitiveness can be considered an opportunity to achieve a suitable position and stability in global markets (Van Hoose, 2010). Market competition is an essential benchmark for assessing industries and firms' quality in competitive areas, including business, political, and economic fields. Each firm or industry with high competitive ability in competitive markets is more competitive (Baggs and Bettignies, 2007). Because of the competitive conditions of the product market, managers face a lot of financial reporting problems. One of these problems is the balance between reporting transparency and the lack of disclosure of excessive information since financial reporting can help companies compete. It may compete with strategic information for competitors. It also affects the ability to do so (Gal-Or, 1985). Ownership costs and agency costs complement the relationship between product market competition and the disclosure of accounting information; therefore, companies that compete in their industry have fewer ownership and representation costs (Cheung, Jiang, and Tan, 2010). The strength of the product market is a natural safeguard against negative implications. Companies with market power have the potential to better off consumers' negative cash flow. This ultimately leads to more profitable earnings and cash flow (Peress, 2010).

Competition in the product markets plays a critical role in disciplining the managers and mitigating agency problems (Alchian, 1950; Stigler, 1958). Also, an increase in product competition increases the likelihood of failure, especially for those firms with high costs (Schmidt, 1997). Much of the industrial organisation literature (e.g., Lindenberg and Ross, 1981 and (Domowitz, Hubbard and Petersen, 1986) used the Lerner Index (LI) (see Lerner, 1934) for the product market power. Lerner Index is referred to as the price-cost margin scaled by sales. This measure does not isolate the firm-specific factors that influence the product market power from industry-wide factors. This metric can fluctuate due to industry-specific attributes that are unrelated to a firm’s market power. Therefore, the industry-adjusted Lerner Index is the value-weighted industry-adjusted Lerner Index (Market Power) and captures firm-specific product market power. Industry-adjusted Lerner Index is the difference between the firm’s price–cost margin and the sales-weighted price-cost margin of all firms within an industry. This modified Lerner Index measure captures the intra-industry market power of a firm purely.

Cremers, Nair and Peyer, (2008) use the industry median price–cost margin to obtain industry competitiveness. They argue that higher profit margins in the industry reflect a less intense competitive environment and that thin margins are associated with greater competitive pressures.

It is argued where a larger number of firms in the industry magnifies competition. Bikker (2004) stated that there are two ways of classification to assess the level of competition, namely, tests on structural and non-structural characteristics. According to Bain (1951), the structural methods focus on characteristics such as the level of concentration in the industry, the number of banks, market share, etc. In line with Mason (1939), the size of a firm has an impact on its competitive policies in the market.

Balakrishnan and Cohen (2011) argue that the number of firms in an industry reflects

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competition for limited funds because firms compete for economic profits and funds from capital markets. They posit that, in the greater competition, firms in highly populated industries will provide a higher quality of information, and hence earnings management will be lower.

On the other hand, industry concentration is typically used to measure competition for industry-level analysis (as opposed to firm-level product power).

Weiss (1971) stated that the higher the industry's concentration level, the higher the monopoly and competition loss level. The low concentration of an industry indicates less market power held by the leading firms, which empowers them to consistently charge a price above those established by the competitive market (Van Hoose, 2010). Therefore, the industrial organisation literature claims that market power in fewer producers enables a firm to set a price above the marginal cost (Lelissa and Kuhil, 2018).

Also, the structure-conduct-perform (SCP) model suggests that market concentration lowers collusion cost between firms and ends in suboptimal profits for all market participants (Bain, 1951). The concentration degree in a market has been considered as one of the major structural characteristics in the traditional SCP paradigm, which predicts the level of competition (Meschi, 1997). The SCP assumes that market concentration and competition level are inversely related as industry concentration encourages collusion (Edwards, Allen and Shaik, 2006).

Conceptually, market structure is a classification system for the key traits of a market, including the number of firms, the similarity of the products they sell, and the ease of entry into and exit from the market. It mainly comprises the market share of its firms and, to a lesser extent, any barriers against new competitors (Bain, 1956).

According to Shepherd (1986), each market structure is somewhere in the range between monopoly (a high market share and entry barrier) and pure competition (low share and barriers).

Industry concentration is usually measured by the Herfindahl–Hirschman Index (HHI). Although HHI, as a measure of concentration, is fairly well rooted in industrial organisation theory (Curry and George, 1983), it could imply high and low competition. Recent research suggests that when market structure is assumed to be endogenous, it is unclear whether low values of concentration capture low or high competition, especially in cross-industry analyses (e.g., Demsetz, 1973; Raith, 2003; Aghion et al. 2005). Therefore, tension exists on the topic of whether industry concentration (competition) is associated with a low or high degree of industry competition (Datta, Iskandar-Datta and Singh, 2013).

Another indicator, namely the Boone indicator, has been used recently to assess the competition (Boone, 2008), representing the structural method relying on Demsetz's efficiency hypothesis (1973). It supported the efficiency–structure hypothesis, which linked the performance with the changes of efficiency targeting, the toughness of the relationship between the efficiency (measured in terms of average cost), and the performance (measured in terms of profitability) (Tusha and Hashorva, 2015). Schiersch and Schmidt-Ehmcke, (2010) stated that the empirical applicability and robustness of the Boone-Indicator are still unknown, and the traditional Lerner-Index is still the only measure that indicates the expected competitive changes correctly. Further, the Boone indicator's optimal specification and estimation remains an open question and should thus be debated (Maliranta et al., 2007). Therefore, in this research, the Boone indicator is not used to measure the product market power.

Herfindahl–Hirschman, common in empirical industrial organisation literature, is routinely applied (Datta, Iskandar-Datta and Singh, 2013). Based on the literature and studies, in this research, the Herfindahl–Hirschman index, Lerner-Index, and industry-adjusted Lerner Index are

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used for measuring product market power. Since we are using different proxies for industry competition unrelated to HHI, our conclusions from the industry level analysis should not be affected by the issues surrounding HHI as a measure of competition.

2.2. Capital Expenditure

Another factor influencing the market power of a product is capital expenditure. Capital expenditures are expenses that are used to generate future profits. In other words, these costs are spent on purchasing new and fixed assets and adding the value of fixed and productive assets available (Biddle and Hilary, 2006). The companies' managers will maximise the company's value and, to achieve this goal, are looking to implement profitable projects in companies, differentiating companies from other companies with similar activity. Execution of capital expenditures requires financing for the implementation of projects in the company.

The previous studies find that capital expenditures have a positive impact on the value of a company. However, most of these studies do not consider the impact of capital expenditures on product market power. Liao, Lin and Lin, (2016) stated that product market competition compels companies to adopt capital expenditure incentives. Corporate investing decisions involve management discretion. Management seeks to face fewer competitive threats in the market (Irvine & Pontiff, 2009), so the question remains whether the capital expenditures will affect Iran's product market power.

Liao, Lin and Lin, (2016) stated that measuring non-financial performance related to the product and product market situation may affect the company's investment decisions. Competition in the product market forces companies to take incentives for capital expenditure. The findings show that a company will not increase future capital expenditures when the industry faces competitive pressures.

2.3. Firms' Value and Value Creating

One of the critical factors influencing the product market power is the company's market value because the goal of companies is to create value and wealth for shareholders. Value creating is essential not only for investors but also for those who manage the company. The survival of organisations is to create value for their shareholders (Pirie and Smith, 2008). Value creation is an important factor in customer orientation and increasing competition in the product market and means an organisation's approach to addressing all stakeholders. In particular, its customers and this approach place the customer at the heart of all their activities and processes. This way, it engineers the organisation to satisfy customers' needs through products and services (Sharma, Krishnan and Grewal, 2001). In the strategic management literature, experts distinguish between value creation and value gaining.

It should be noted that the use of value and money exchange also increases when the proportionality and novelty of products or services increase. Creating these fittings and novelty in products or services often leads to a situation where supply is limited and demand is high. That is why competition is intensifying. The result of this competition is that the exchange of value (i.e., price) is reduced, and that decline and the downward trend continue to the point that supply and demand become equal. In addition, competition is not limited to the organisational level, but it is likely to compete at other value determination levels. This reduces the workforce's value since its bargaining power has fallen (Schumpeter, 2017). Competition among companies allows society to benefit from the advantages of low prices. There is an interconnected relationship between competition and value creation. Such a competition is due to value creation activities, but value

creation is also the result. At the individual level, evidence suggests that competition increases the ability to achieve creative solutions that create value (Amit and Zott, 2001).

Value creation is crucial for a firm's success in the business market (Lusch and Vargo, 2006), and management seeks to face fewer competitive threats in this market (Irvine & Pontiff, 2009). In line with this argument, Li, Lu and Phillips, (2019) found that firms are more likely to have powerful CEOs in high-demand product markets where firms face entry threats and investors react more favourably to the announcements granting more power to CEOs. Further, CEO power is associated with higher market value, sales growth, investment and advertising, and the introduction of more new products.

Firms' value creation activities can be classified as facilitating customers' value creation by providing potential resources (e.g., products) (Grönroos and Voima, 2013). Competition in these product markets can help explain the relationship between CEO power and firm value. The empirical evidence on how competition affects the relationship between CEO power and firm value is scant and not clear. Han, Nanda and Silveri, (2016) find that powerful CEOs perform worse when market competition is high than other CEOs. Li, Lu and Phillips, (2019) found a positive relationship between CEO power and firm value in high-demand markets. According to Sheikh (2018), a positive association is between CEO power and firm value when the competition is high. However, the present research seeks to determine whether there is a relationship between market value and product market power.

Further, such a scenario will put industry concentration inversely related to the consumer's welfare and the number of firms in the industry (Shepherd, 1986). Also, if concentration falls, the firm's price gets closer to marginal cost, which leads to a fall in market power (Lelissa and Kuhil, 2018).

Bustamante and Donangelo (2017) argued that product market competition has two negative effects on stock returns: first, the waste of costs to compete in the product market. Second, The company's profit margin decreases because of competition in the product market. Therefore, companies in competitive industries have lower stock returns, resulting in less value.

Jory and Ngo (2017) show that companies that are dominant in the market power of the products are at lower risk. They stated that increasing the product's market power using the Herfindahl–Hirschman index increased the companies' stock returns, resulting in more value.

Sheikh (2018) found that CEO power has a positive and significant effect on firm value. However, this effect is driven by product market competition as CEO power positively affects firm value only in high competition markets and has no effect on firm value in low competition markets. Moreover, the results indicate that product market competition motivates powerful CEOs to use their powers to make value increasing decisions.

One of the approaches to value creation is the proposed Pulic (2004) model, which includes two major factors: capital construction and human capital (Iazzolino and Laise, 2016).

Blazsek and Escribano (2016) found a dynamic interaction between research and development costs and stock returns. Increased competition in the innovation of new products enables companies to invest more in research and development activities.

Given the theoretical and historical foundations, the research hypotheses are as follows:

H_1: There is a significant relationship between the company's market value and the Herfindahl–Hirschman index.

H_2: There is a significant relationship between the market value of the company and the Lerner index.

H_3: There is a significant relationship between the company's market value and the Industry-adjusted Lerner Index.

H_4: There is a significant relationship between capital expenditures and the Herfindahl–Hirschman index.

H_5: There is a significant relationship between capital expenditures and the Lerner index.

H_6: There is a significant relationship between capital expenditures and the Industry-adjusted Lerner Index.

H_7: There is a significant relationship between value creation and the Herfindahl–Hirschman index.

H_8: There is a significant relationship between value creation and the Lerner index.

H_9: There is a significant relationship between the value creation and the Industry-adjusted Lerner Index.

3. Research Methodology

The statistical population of this research includes companies listed on the Tehran Stock Exchange that meet the following requirements:

1. Their financial period will end in March each year,
2. Selected companies are not part of investment companies, financial intermediation, holding, banks, and insurance,
3. During the research period, companies have no change in the financial period,
4. The information needed to research during the period from 2013 to 2018 should be fully presented.

According to the study's findings and the restrictions imposed above, this study's available sample includes 129 companies.

3.1. Research Model and Variables

To test the research hypotheses, models 1, 2, and 3 have been used. Three indicators have been used to estimate the product's market power. Models 1 represent the Herfindahl–Hirschman index, model 2 represents the Lerner index, and model 3 represents the Industry-adjusted Lerner Index.

$$\begin{aligned} HHI_{it} &= \beta_0 + \beta_1 LnMV_{it} + \beta_2 I_{it} + \beta_3 VA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} \\ &+ \beta_6 MTB_{it} + \beta_7 LnSale_{it} + \beta_8 ATURN_{it} + \beta_9 ASize_{it} + \beta_{10} CURR_{it} \\ &+ \beta_{11} No.Co_{it} + \beta_{12} IndustryDummy_{it} + \beta_{13} YearDummy_{it} + \delta_i + \theta_t + \varepsilon_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} LI_{it} &= \beta_0 + \beta_1 LnMV_{it} + \beta_2 I_{it} + \beta_3 VA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} \\ &+ \beta_6 MTB_{it} + \beta_7 LnSale_{it} + \beta_8 ATURN_{it} + \beta_9 ASize_{it} + \beta_{10} CURR_{it} \\ &+ \beta_{11} No.Co_{it} + \beta_{12} IndustryDummy_{it} + \beta_{13} YearDummy_{it} + \delta_i + \theta_t + \varepsilon_{it} \end{aligned} \quad (2)$$

$$\begin{aligned} LIIA_{it} &= \beta_0 + \beta_1 LnMV_{it} + \beta_2 I_{it} + \beta_3 VA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} \\ &+ \beta_6 MTB_{it} + \beta_7 LnSale_{it} + \beta_8 ATURN_{it} + \beta_9 ASize_{it} + \beta_{10} CURR_{it} \\ &+ \beta_{11} No.Co_{it} + \beta_{12} IndustryDummy_{it} + \beta_{13} YearDummy_{it} + \delta_i + \theta_t + \varepsilon_{it} \end{aligned} \quad (3)$$

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3.1.1. Dependent Variable

In this research, the Herfindahl–Hirschman index, Lerner index, and Industry-adjusted Lerner Index were used to measure the product's market power.

Herfindahl–Hirschman Index (HHI): This index is the basis for evaluating the degree of evolution of the concentration indices. Herfindahl–Hirschman Index determines how the market size distribution between existing firms and the market structure is better than the concentration ratio. This indicator is used in the studies of He (2012), Marciukaityte and Park (2009), and Grullon and Michaely (2007) as a measure of power in the product market and is calculated as the ratio 1:

$$HHI = \sum_{i=1}^{nj} \left(Sales\, i,\, j \Big/ \sum_{i=1}^{nj} sales\, i,\, j \right)^{\wedge}2 \quad (1)$$

In equation 1 $sales\, i, j$, in the case of a deduction, the company's sales and denominator are equal to the company's total sales in the industry. The Herfindahl–Hirschman index measures industry concentration. No matter how much is this indicator is, it shows more concentration and less competition in the industry, and vice versa. Since the existing software and databases only include companies listed on the Tehran Stock Exchange, the measurement criterion calculated may reduce the industry's competitiveness because it does not consider private companies.

Lerner Index (LI): This indicator equals the company's price minus the production's final cost. This indicator directly indicates market power characteristics: the company's ability to charge a price higher than the final cost. The challenge before using the Lerner index in empirical research is that the final costs are not visible. Hence, researchers generally calculate the Lerner index through the cost-margin (Booth and Zhou, 2008). According to Kale and Loon (2011), Gaspar and Massa (2006), the Lerner index is calculated as a profit-sharing divided by sales, as shown in equation (2).

$$LI = \frac{SALE - COGS - SA\&A}{SALE} \quad (2)$$

In this regard:

SALE: Represents the sales of the company.

COGS: represents the cost of goods sold by the company.

SG & A: Indicates the sales, general and administrative expenses

Industry-adjusted Lerner Index (LIIA): Industry-adjusted Lerner Index was used to capture firm-specific product market power. To do so, we compute the value-weighted industry-adjusted Lerner Index, the difference between the firm's price–cost margin the following equation describes and the sales-weighted price-cost margin of all firms within an industry.

$$LIIA = LIi - \sum_{i=1}^{N} \omega i LI_i \quad (3)$$

LIi is the Lerner Index defined in Eq.(2) for firm i, ωi is the proportion of firm sales of firm i to total industry sales, and N is the total number of firms in the industry.

This modified Lerner Index measure captures the firm's intra-industry market power purely, therefore purging the effects of industry-wide factors common to all firms in a specific industry. Further, this adjustment addresses that different industries have structurally different profit margins

due to factors unrelated to intra-industry differences in firms' market power (Datta, Iskandar-Datta and Singh, 2013).

3.1.2. Independent Variables

$LnMV_{it}$.: logarithmic of the market value of the company. The number of shares calculates the company's market value multiply stock prices at the end of the period.

I_t: is Capital expenditures and calculated based on Equation 4:

$$I_{i,t} = (\text{Net Fix Assets}_{it} - \text{Net Fix Assets}_{it-1}) + DEPN_{it} \quad (4)$$

In the above Equation:

$I_{i,t}$: company's capital expenditures.

$\text{Net Fix Assets}_{it}$: Equals to the net fixed assets of the firm i in the year t.

$\text{Net Fix Assets}_{it-1}$: Equals to the net fixed assets of i in the year t-1.

$DEPN_{it}$: is equal to the depreciation expenses of the company i in year t.

According to the article (Jory and Ngo 2017), the obtained number is divided into assets to scale the variable.

VA_{it}: One of the approaches taken in the field of value creation is the proposed Pulic's Model (2004), which includes two critical factors of capital construction and human capital, calculated as Equation 5 (Iazzolino& Laise, 2016):

$$VA_{it} = HC_{it} + SC_{it} \quad (5)$$

In the above relation:

VA_{it}: represents value creation.

HC_{it}: represents the human capital of company i in year t, which can be calculated according to the staff expenditures (wages and salaries).

SC_{it} represents the structural capital of firm i in the year t, which can be calculated through the total expenses of depreciation, interest rate, taxes, and net income.

It should be noted that the resulting number is divided into total assets to scale the variable with the other variables.

3.1.3. Control Variables

The control variables of this research are presented below:

LEV_{it}: Leverage can be calculated by dividing debt into assets.

ROA_{it}: represents the return on assets

MTB_{it}: Growth rate calculated by the ratio of market value to the book value of equity.

$LnSale_{it}$: This is logarithmic of company sales.

$ATURN_{it}$: variable of the turnover ratio of assets that can be calculated by dividing sales into total assets

$ASIZE_{it}$: The Dummy variable for auditing by the audit organisation and Mofid Rahbar (the reason for choosing these companies are that they have higher quality, higher earnings, and more professional independence than other institutions). If the Auditing organisation and Mofid Rahbar have audited the company, the variable equals 1; otherwise, zero.

$CURR_{it}$: The current ratio obtained through the division of current assets into total assets, and the higher it represents, the greater is the auditor's audit complexity.

$No.Co_{it=}$ number of firms in the industry

Industry Dummy: The industry's dummy variable.

Year Dummy: The dummy variable of the year.

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4. Empirical Results

4.1. Descriptive statistics

Table 1 depicts the information related to the variables of the model.

Table 1. Descriptive statistics of variables

Variable	mean	Std. dev.	Minimum	Maximum
HHI_{it}	0.030	0.124	0	0.954
LI_{it}	0.178	0.259	-2.796	1.967
LII_{it}	0.102	0.285	-2.814	1.967
$LnMV_{it}$	14.279	1.473	11.286	18.980
I_{it}	0.122	0.177	-0.748	0.681
VA_{it}	0.288	0.300	-1.272	1.275
LEV_{it}	0.602	0.226	0.090	2.315
ROA_{it}	0.111	0.151	-0.789	0.631
MTB_{it}	3.350	4.032	-53.351	26.177
$LnSale_{it}$	13.949	1.525	8.504	19.367
$ATURN_{it}$	0.922	0.586	0.014	5.144
$ASize_{it}$	0.255	0.436	0	1
$CURR_{it}$	0.661	0.191	0.142	0.963
$NoCo_{it}$	18.627	7.148	2	29

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4.2. Multivariate Regression Analyses

By analysing most of the variables' unit root, all are at no unit root level (stationary). The obtained LM statistic for each variable is reported in Table 2. Only the variables of ATURN it, A Size it, and CURR it is at the unit root level. The obtained LM statistic for the unit root test of this variable rejects the null hypothesis concerning the absence of unit root at a level with 99% probability.

Table 2. The results of the Hadri unit root test

Variable	Level	Variable	Level	First-order difference	Second-order difference
HHI_{it}	0.1463	ROA_{it}	0.9824		
LI_{it}	0.5717	MTB_{it}	0.9984		
LII_{it}	0.1458	$LnSale_{it}$	0.6263		
$LnMV_{it}$	0.4408	$ATURN_{it}$	0.0000 ***	1.0000	
I_{it}	0.7760	$ASize_{it}$	0.0000 ***	0.0002	1.0000
VA_{it}	0.9999	$CURR_{it}$	0.0000 ***	1.0000	
LEV_{it}	0.7314	$NoCo_{it}$	0.5874		

Note: the null hypothesis is the absence of unit root in variables. LM statistic is reported. *** and * are the level of significance of 99 and 90%.
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By one-time difference from these variables, the first-order difference of A TURN variables and CURR has no unit root. Moreover, the second-order difference of the A Size variable is also with no unit root.

To estimate the pattern, we should first realise whether the data are pooled or panel by the F test. This test's null hypothesis expresses that data are pooled, and hypothesis 1 declares that data are panel. If H0 is rejected after performing the F test, the question poses here that models of fixed effects or random effects do the model are analysable, the answer to which is the Hausman test. Given the integration test results presented in Table 3, the null hypothesis concerning the presence of pooled data is rejected at a 99% confidence level for the first two models. As for the third model, the null hypothesis concerning pooled data is rejected at a 95% confidence level, so panel data models should be used to estimate these three models' coefficients.

Table 3. The results of the integration test

	Calculated statistic	Probability level
Model 1	17.57	0.000 ***
Model 2	2.43	0.000 ***
Model 3	1.39	0.015 **

Note: *** and **show 99 and 95% significance level, Resource: research findings
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There are two general methods for estimating a panel data model: fixed effects and random effects. Hausman test is used for determining the appropriate model for estimation. In estimating the fixed effects model, it is assumed that there is a different intercept for each country, and this intercept can be correlated with the model's descriptive variables. This approach is also known as the Least Squares Dummy Variable (LSDV). In the random-effects model, the individual effects are fixed, but they change within the countries.

Table 4 shows the results of this test, through which the Hausman test statistic based on the estimation is 3.84, 8.51, and 3.83 for models 1-3, which is smaller than χ^2 the value, and the null hypothesis is not rejected. Hence, the random-effects model is selected as the most appropriate model.

Table 4. Hausman test result

	Calculated statistic	Probability level
Model 1	3.84	0.9010
Model 2	8.51	0.3857
Model 3	3.83	0.8724

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According to the discussed theoretical section, the empirical models were estimated based on panel data's random-effects method. In this phase, to analyse the market power, three models were estimated. In the first model, the Herfindahl-Harrishenman Index, in the second model, the Lerner index, and the adjusted Lerner index were used in the third model. The results of the estimation of these three models are illustrated in Table 5. The first column of this table shows the name of effective variables in market competition. As shown in Table 5, the estimation of the Feasible Generalised Least Squares (FGLS) model is reported. In this panel data model, four classic econometric hypotheses were analysed, and reliable reports were reported. These four hypotheses

include linearity among variables, exogeneity of descriptive variables, homogeneity variance, and lack of serial autocorrelation among disruptive components.

Table 5. The results of model estimation

Variable	Model 1 Coefficient (p-value)	Model 2 Coefficient (p-value)	Model 3 Coefficient (p-value)
Constant	-0.5545 (0.000)	-0.0768 (0.388)	0.6721 (0.000)
$LnMV_{it}$	0.0397 (0.000)	0.0182 (0.000)	-0.0365 (0.014)
I_{it}	0.0510 (0.066)	0.0699 (0.008)	-0.0366 (0.000)
VA_{it}	-0.0815 (0.014)	0.4089 (0.000)	0.4828 (0.000)
LEV_{it}	0.0260 (0.004)	-0.0143 (0.005)	-0.0369 (0.024)
ROA_{it}	0.0891 (0.012)	0.3901 (0.000)	0.3558 (0.011)
MTB_{it}	-0.0037 (0.057)	-0.0030 (0.078)	-0.065 (0.057)
$LnSale_{it}$	-0.0115 (0.015)	0.0269 (0.018)	0.0337 (0.015)
$ATURN_{it}$	0.0024 (0.071)	-0.0696 (0.000)	-0.0705 (0.000)
$ASize_{it}$	-0.0270 (0.013)	0.0294 (0.087)	0.0423 (0.038)
$CURR_{it}$	0.0212 (0.083)	-0.0582 (0.005)	-0.0142 (0.038)
$No.Co_{it}$	-0.0004 (0.023)	-0.0010 (0.016)	-0.0050 (0.041)
Wald Chi2	155.58 (0.000)	903.82 (0.000)	481.88 (0.000)
Number of obs.	641	641	641
Log Likelihood	492.2151	255.9395	86.9383

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Given the used regressions, only the intercept of models 1 and 3 become significant. The intercept of these two models is -0.5545 and 0.6721 have a 99% significance level. In contrast, the firm's coefficient of the logarithm of market value is significant in all three models. The coefficient of the LnMV variable is positive in the first model with a 99% confidence level, so with a 1% increase in the logarithm of the market value of the firm, the Herfindahl-Harrishenman Index, which is indicative of market power, will increase by 0.0397% and the market power will be reduced. The coefficient of LnMV is positive in the second model and estimated negatively in the third model, and become significant with the respective confidence level of 99 and 95%. Thus, with a 1% increase in the firm's market value, the Lerner index will increase by 0.0182% regarding the second model estimation. Regarding the third model estimation, the adjusted Lerner index will decrease by -0.0356%, and by the decline of market competition, the firm's market power will increase.

The variable coefficient is only significant for all three models with respective 90, 99, and 99% significance levels. Given the estimation of the first and second model, with the increase of capital expenditures, market competition will increase based on the Herfindahl-Harrishenman and Lerner indices and decrease due to the firm's market power. In contrast, in the third model, the coefficient of capital expenditures is negative. By increasing such expenditures, market competition will reduce based on the Lerner Index and increase due to the firm's market power.

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The VA variable's coefficient is significant for all three models, so by increasing the value creation, the Herfindahl-Harrishenman index and market competition will reduce, and market power will increase. The coefficient of this variable is significant at a 95% confidence level. In contrast, the coefficient of this variable in the second and third models is positive. Hence, with a 1% increase in the VA variable, the Lerner Index will increase by 0.4089%, and the Adjusted Lerner Index will increase by 0.4828% at a 99% level.

The financial leverage variable is positive and significant in the first and most significant models of the other two models. The LEV variable's coefficient is significant in the first and second models at a 99% level and 95% level in the third model. Regarding the estimation of all three models, with a 1% increase in financial leverage, market competition will increase by 0.0260% based on the Herfindahl-Harrishenman Index and will reduce by -0.0143% based on the Lerner Index. By -0.0369%, based on the Adjusted Lerner Index, this would lead to the firm's market power.

Profitability increases market competition and consequently lowers the market power of the firm. The ROA's coefficient in the first, second, and third models is 0.0891, 0.3901, and 0.3558, respectively, with a 99% significant level. Hence, with a 1% increase in profitability, the Herfindahl-Harrishenman, Lerner, and Adjusted Lerner Indices will also increase.

The MTB variable's coefficient is -0.0037 in the first model with a significance level of 95%, so with a 1% increase in the growth index, the Herfindahl-Harrishenman Index and the firm's market power will reduce. Based on the second model, with a 1% increase in the growth index, the market competition based on the Lerner index will decrease by -0.0030% at a 95% level of significance. Based on the third model, with a 1% increase in the growth index, the market competition based on the Adjusted Lerner index will decrease by -0.065% at a 90% significance level.

The variable of LnSale has a negative and significant coefficient in the first model and is positive and significant in the other two models. The firm's sales logarithm coefficient is significant in models 1-3 at the 95% level. With a 1% increase in the sales logarithm of the firm, market competition will decrease by -0.0115 based on the Herfindahl-Harrishenman Index will increase by 0.0269% based on the Lerner Index and will increase by 0.0337% based on the Adjusted Lerner Index, and this would lead to the decline of market power of the firm.

In contrast to the other two models, the coefficient of assets turnover ratio is positive in the first model, significant at 90%. Hence, with a 1% increase in the variable of ATURN, the Herfindahl-Harrishenman Index will decrease by 0.0024%, the Lerner index will decrease by -0.0696%, and the Adjusted Lerner Index will decrease by -0.0705%, and the market power of the firm will increase.

The audit organisation's virtual variable of audit and Mofid Rahbar (A-Size) affects all three indices. Considering the first model estimation, if the audit organisation and Mofid Rahbar select the auditor, the market competition based on this index will decrease by -0.0270% at a 95% confidence level, and market power will increase. In contrast, the variable of A size is the increasing factor for Lerner and Adjusted Lerner indices.

The coefficient of CURR is positive and significant in the first model. The coefficient of current assets to total assets in this model is significant at the 90% level. With a 1% increase in current assets to total assets ratio, market competition will increase based on the Herfindahl-Harrishenman Index by 0.0212%, which will decrease by -0.0582% based on the Lerner Index, and will decrease by -0.0142 % based on the Adjusted Lerner Index.

The number of firms in the industry has been a reduction factor for all three variables. The Herfindahl-Harrishenman, Lerner, and adjusted Lerner Indices will decrease by -0.0004, -0.0010, and -0.0050% at a 95% level, respectively. In addition, the dummy variables of industry and year

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were also considered in the model, the coefficients of which are not significant.

5. Discussion and Conclusion

According to statistical data, the authors concluded a positive (negative) correlation between the firm's market value and the Herfindahl–Hirschman Index and Lerner Index (Industry-adjusted Lerner Index). This study's results are consistent with studies conducted in this field, including Jory and Ngo (2017). In line with Sheikh (2018), CEO power has a positive and significant effect on firm value. Product market competition motivates powerful CEOs to use their powers to make value increasing decisions.

This study shows a positive (negative) correlation between capital expenditure and the Herfindahl–Hirschman index and Lerner Index (Industry-adjusted Lerner Index). Still, according to Liao, Lin and Lin's findings (2016), when the industry faces competition pressure, a firm will not increase capital expenditures. Results of the study by Gholami and Khatiri (2016) indicated that competition in the product market with the Industry-adjusted Lerner Index has no significant effect on investment in capital expenditures. In contrast, Frank and Goyal (2009) concluded that with increasing competition in the product market, investment in fixed assets of companies would increase.

The results also show a negative (positive) relationship between value creation and the Herfindahl–Hirschman Index (Lerner Index and Industry-adjusted Lerner Index).

This study, like other research studies in this field, has a time and place constraint. The realm of time for all the tests performed and its domain is Tehran Stock Exchange. Therefore, it should be considered in its generalisation to other times and other statistical societies.

The obtained results based on Herfindahl-Harrishenman and Lerner indices show that firms gaining more market value and increasing their capital expenditures will cause firm competition in the product market and lower the power in the product market.

The firms' environment is currently growing and competitive, and firms for making progress require activity development through new investments. The managers are recommended to expand their market power by increasing the capital expenditure to send positive signals to the capital market. These positive signals would attract investors and their more appropriate decisions. In addition, the country and Stock Exchange authorities are recommended to pave the way for increased competition among the listed firms on Tehran Stock Exchange that, in turn, motivates the investors for productive investments and brings about economic flourishment.

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