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The Determination of The Optimal Portfolio of Pension Funds in Iran

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Extended Abstract

1- INTRODUCTION

Pension funds, as intergenerational financial institutions, should be able to finance individuals in old age and disability by accumulating the micro-savings of the insured and investing in them. Therefore, one of the concerns of the mentioned funds is how to invest the micro-savings of the insured in different areas. In Iran, pension funds under the Ministry of Cooperatives, Labor and Social Welfare play a significant role in the capital market and more than 53% of the daily value of the assets of these funds belong to the listed companies (47% of non-listed capital), which possess more than 13% of the total market daily value (stock exchange and over-the-counter).

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2- THEORETICAL FRAMEWORK

Minimizing portfolio risk, investors can obtain an efficient portfolio for a certain return. Continuation of this process leads to the development of efficient portfolios, called the mean-variance efficiency frontier. The following data are required to apply the Markowitz model:

1. Expected return on stock i, denoted by E(Ri).
2. The standard deviation of the expected return on ith stock, considered as an indicator for the risk of every stock, denoted by Si.
3. Covariance, as an indicator of coordination between the return rates of different stocks, denoted by δij.

3- METHODOLOGY

To determine the optimal portfolio, first the returns of the days in which the transaction did not take place were interpolated by MATLAB and interpolation method and a matrix of 1354 × 9 was obtained. Then, at a 15 percent confidence level, the normality of the time series of returns of each group of industries was investigated by Jarque-Bera (JB) test. Next, the Markowitz model was solved and the weights were determined for each stock in the optimal portfolio of the Social Security Pension Fund. Research data were collected daily for the period 2015:03:25 – 2020:09:21 from the website of the Financial Information Processing Center of Iran and the Social Security Investment Company.

4- RESULTS & DISCUSSION

Findings show that for investment in the Social Security Pension Fund, among real portfolio, the Markowitz model portfolio and the VaR model portfolio, the Markowitz model optimal portfolio is better than the VaR portfolio and the real portfolio as it has the highest return-to-risk ratio. In order to optimize the investment portfolio, this fund should increase its investment share in the groups of pharmaceutical materials and products by 7%, investments by 2% and the base metals by 1%. It should also reduce its investment share in the groups of multidisciplinary companies by 3%, chemical products by 3%, cement, gypsum and lime by 2% and petroleum products by 2%.

5- CONCLUSIONS & SUGGESTIONS

Since the results of the study show that the proposed portfolio of this study based on the Markowitz model is optimal for investing in the stock industries of the Social Security Fund, it is suggested to the authorities and planners of this fund to change their existing investment portfolio to the proposed portfolio and especially increase their share of investment in the group of pharmaceutical materials and products as the Social Security Organization (TPICO Holding) has an advantage in this industry on a national scale and its development is consistent with the organization's strategies. It is also suggested that the Social Security Fund reduce the dispersion of investment in markets-industries and over-investment in company management as it has always posed a great risk to pension funds around the world.

Keywords: Investment Portfolio, Stock Industries, Social Security Fund, Markowitz Model, VaR Model.

References (in Persian)

Amani, Mohammad Mehdi; and Anari, Mohammad Reza. (2018). Actuarial Principals and Requirements for Merging Defined Benefits Pension Funds with Pension Fund of Social Security Organization, Quarterly Social Security Journal 13 (2): 59-98. (In Persian)

Abbasi, Ibrahim; Teymouri, Babak; Molaei, Arefeh; and Esmaili, Zahra. (2017). The Application of Conditional Value at Risk in Portfolio Optimization based on Structural Breakpoint Approach in Tehran Securities Exchange, 7 (2): 85-103. (In Persian)

Dideh-Khani, Hossein; Shiri Ghahi, Amir; Miran, Behzad. (2019). A model for selecting the optimal portfolio in conditions of uncertainty using the mean-odds model (prospective approach to estimate the yield function), Financial Knowledge of Securities Analysis, 12 (43): 73-87.

Ebrahimi, Ilnaz and Hemmati, Maryam. (2018). The Role and Effects of Pension Funds on Financial Stability in Iran; The Necessity of a Macro Prudential Authority; Central Bank of the Islamic Republic of Iran. Monetary and Banking Research Institute, Report code: 293880. (In Persian)

Gorjipour, Esmail; Akhavan Behbahani, Ali. (2020). The current situation of small social insurance funds and provide a model for them, Research Center of the Islamic Consultative Assembly, No. 17094. (In Persian)

Hashemi, Seyed Navid; Molavi, Negar. (2020). Analysis of capital market developments and review of the stock portfolio of pension funds affiliated to the Ministry of Cooperatives, Labor and Social Welfare, Deputy Minister of Economic Affairs and Planning of the Ministry of Cooperatives, Labor and Social Welfare. (In Persian)

Izadbakhsh, Hamid Reza; Soleimanzadeh, Ahmad; Davari Ardakani, Hamed; Zarrin Bal, Marzieh. (2017). A Systematic Approach for Asset Liability Management of Pension Funds in a Fuzzy Environment, Research and Economic Modeling, 29: 240-201. (In Persian)

Iran Financial Information Processing Center Website (2020). http://www.fipiran.com/(In Persian)

Mehdizadeh, Saber; Sabet, Parisa. (2012). Selection of Optimal portfolio of oil company pension fund using Markowitz and VaR models, Third Conference on Financial Mathematics and Applications, Semnan University, Semnan. (In Persian)

Naderi Nooreini, Mohammad Mehdi. (2018), The Best Methodology of Estimation of Value-at-Risk in Iranian Mutual Funds, 6 (1): 159-180. (In Persian)

Rai, Reza; Telangi, Ahmad. (2008). Advanced Investment Management, Samat Publications, Second Edition. (In Persian)

Rajabi, Zahra; Gerami, Asghar. (2017). Financial, insurance and economic status of pension funds, Economic Deputy of the Ministry of Cooperatives, Labor and Social Welfare. (In Persian)

Rostami, Morteza; Badiani, Hossein. (2019). Company Management of Pension Funds in the Social Security System of Iran, 21 (63): 271-295. (In Persian)

Rostami, Morteza; Habibnejad, Seyed Ahmad. (2017). The Review of Investment of Iran's Pension Funds in light of Investment Principles, 14 (1): 95-115. (In Persian)

Rahnama Roodposhti, Fereydoun; Mirghafari, Seyed Reza. (2013). Portfolio Performance Evaluation at Tehran Stock Exchange: The Use of Value at Risk, Journal of Financial Engineering and Securities Management, 71: 7-27. (In Persian)

Shahsharghi, Mohsen. (2016). Bankruptcy of Pension Funds; Fire Under the Ashes of Iran's Economy, Government and Nation Weekly Journal, 10: 10-12. (In Persian)

Social Security Investment Company Website. (2020). https://www.ssic.ir/#(In Persian)

References (in English)

Ardia, D. and Boudt, K. and Nguyen, G. (2018). Beyond Risk-Based Portfolios: Balancing Performance and Risk Contributions in Asset Allocation. *Quantitative Finance*, *8*(18): 1249-1259.

Dahlquist, M. & Arne Ø. B. (2018). *A Review of NorgesBank's Active Management of the Government Pension Fund Global*, University of Stavanger.

Davis, E. Philip. (2001). Portfolio regulation of life insurance *companies and pension funds*, ISSN 1367-580X

Dobra, M., & H. Lubich, B. (2013). Public pension governance and asset allocation. The Business and Economics Research Journal, 6, 1-19.

Gordon, J. A. Baptista, A. M. (2001). Economic Implication of Using a Mean-Var Model for Portfolio Selection: A Comparison with Mean-Variance Analysis, *Journal of Economic Dynamic control,* 26: 94.

Hanen, O. A. and Faouzi J. (2014). VaR Computation of Non-Gaussian Stochastic Model, Journal of Advanced Management Science, 2(1): 61-64.

Inderst, G. (2014). Pension fund investment in infrastructure: lessons from Australia and Canada. Rotman International *Journal of Pension Management*, 7(1), 31-59.

ISSA. (2017). Guidelines on investment of social security funds. Turin.

Li, J., & Xu, M. (2013). *Optimal Dynamic Portfolio with Mean-Cvar Criterion*. Risks, 1(3), 119-147.

Liu, Y. J., Zhang, W. G. & Zhang, Q. (2016). Credibilistic multi-period portfolio optimization model with bankruptcy control and affine recourse, Applied Soft Computing, 38: 890-906.

Seegert, N. (2017). Optimal Tax Portfolios: An Estimation of Government Tax Revenue MinimumVariance Frontiers. URL: http://www-personal.umich.edu/~seegert/papers/OptimalTaxPortfolios_Seegert.pdf

Sharma, P. & Vipul. (2015). Performance of risk-based portfolios under different market conditions: Evidence from India, Research in International Business and Finance, Elsevier, vol. 34(C), pages 397-411.

Theron, L. Vuuren, G. V. (2018). The Maximum Diversification investment strategy: a portfolio performance comparison, Journal of Cogent Economics & Finance, DOI: http://doi.org/10.1080/23322039.2018.1427533.

Yin, X., Ni, Q. & Zhai, Y. (2015). A novel PSO for portfolio optimization based on heterogeneous multiple population strategy, In 2015 IEEE Congress on Evolutionary Computation (CEC) (pp. 1196-1203). IEEE.

Yu, X., Sun. H., & Chen, G. (2011). The optimal portfolio model based on Mean-CVaR. Journal of Mathematical Finance, 1, 123-121.

Determination of Monetary Transmission Mechanism Channels in Iranian Economy by Using Simulation of Bayesian DSGE Model Based on Taylor Rule

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Extended Abstract

1- INTRODUCTION

Various variables in the economy are affected by monetary policy, which is a process of particular importance for policy-making. in a real economy, the transfer mechanism describes how monetary policy instruments affect the ultimate goal variables. there are two monetary and credit views on how money transfers.

2- THEORETICAL FRAMEWORK

Monetary policy is a tool for influencing economic variables that this influence on the economy is formed as a process that is of particular importance in policy-making. the process by which monetary policy instruments affect the ultimate goal variables in a real economy is called the

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transfer mechanism. there are two views of money and credit on the mechanism of money transfer.
the monetary perspective is based on the interest rate channel, the exchange rate channel, the asset price channel and the expectations channel.
the credit view is based on the bank lending channel and the balance sheet channel.
in this research, the channels of money transfer mechanism have been studied based on different perspectives. the channels examined are interest rate channel, exchange rate channel, asset price channel, q-tobin channel, wealth effect channel, credit channel, bank lending channel, balance sheet channel and expectations channel.

3- METHODOLOGY

The study uses a stochastic dynamic general equilibrium model based on the new keynesian approach to an open economy. it includes four sections of economic factors including household, domestic and importing firms, foreign trade, and monetary policy. the linearized structural equations include several types of nominal adhesions, and occurs around the steady-state point. on this basis, the money transfer mechanism is determined based on the effect of monetary policy on output. also, taylor's rule (taylor, 1993) used to adjust monetary policy by using the non-covert equity ratio of the interest rate as the reference interest rate (shadow interest rate). in this study, the parameters of the linearized model using the bayesian method, and for the period of 2018 through 2020, the data were used to estimate the seasonal time series. also used MCMC and Metropolis-Hasting’s simulations to verify the results.

4- RESULTS & DISCUSSIONS

According to the results of the analysis of the variance, following channels affecting Iran's money transfer mechanism were identified:

- Interest rate channel: as a result of interest rate shock, the rates of change in real interest rate, investment and real production are equal

to 44.91%, 0.47% and 6.43%. this channel shows the real impact of monetary policy based on interest rates.

- q-Tobin channel: the amount of change in q-tobin channel, investment and real output in response to the monetary policy shock is 36.74%, 2.76% and (0.02%), therefore q-tobin channel is an effective channel.
- expectation channel: the expected inflation rate is 49% and the production impact is 32.8%, so the expectation channel is effective.
- Wealth channel: as a result of the change in interest rates, q-tobin changed by 36.74%, which affected household consumption by 0.02%. as the result, this channel is effective. exchange rate channels, bank facilities and balance sheets have no effect on this model.

Effective channels in order of relative importance in this rule are: expectation channel, interest rate channel, q-tobin channel and wealth channel.

In order to analyze the long-term production behavior and the result of an analysis of the variance table, the share of each structural shock on production and its components is as follows:

- Production is mainly affected by the shock of preferences, which 35.09% of gdp forecast error explains the impact of this shock on production. after that, domestic inflation shock, investment shock, monetary policy shock, government spending shock and wage shock affect production variance.
- As a result of the internal inflation shock, 65.7% of the inflation fluctuations are explained by this shock. inflation variance is then affected by shadow interest rate shocks, money demand shocks, investment shocks and q-tobin shocks.
- Most fluctuations in consumption are caused by preference shock and investment shock, which 72.87% of the consumption variance is explained by these 2 shocks. consumption variance is then affected by internal inflation shock, shadow interest rate shock, wage shock and q-tobin shock.

Investment variance is then affected by domestic inflation shock, q-Tobin shock, shadow interest rate shock and wage shock.

- Most net export fluctuations are caused by monetary policy shocks and domestic inflation shocks, which 99.16% of the net export fluctuations variance is explained by these two shocks.

next export fluctuations are then affected by preference shocks, wage shocks, investment shocks and q-Tobin shocks.

5- CONCLUSIONS & SUGGESTIONS

The effective channels of Iran's money transfer mechanism are: expectations channels, interest rates, q-tobin and wealth channel, and according to the simulations, increasing interest rated reduce production, consumption, investment and capital utilization rates.

keywords: Monetary transmission mechanism, DSGE model, Bayesian Simulation.

References (in Persian)

Albaji, Y., Azarbayjani, K., & Daei-Karimzadeh, S. (2020). The response of Iranian economy to monetary and exchange rate policies shocks base on the foreign sector: A dynamic stochastic general equilibrium analysis. *Quarterly Journal of Quantitative economics,* Doi: 10.22055/JQE.2021.33852.2255. (in Persian)

Bakhshi Dastjerdi, R.; Rahmani, A. & Samadi, S. (2019). An analysis of the empact of financial policy shocks on the stock market: random dynamic general balance approach. *Scientific Research Journal of Economic Approach*, *8*(29), 81-110. (in Persian)

Faaljo, H.; Heydari, H., & Saeedpour, L. (2018). Financial shocks effect on Iran's macroeconomic variables in different oscillating regimes: DSGE MARKOV switching. *Scientific Research Journal of Practical Economic Studies of Iran, 7*(25), 55-83. (in Persian)

Akbarian, R.; Dehghan Shabani, Z.; Farahani, M. & Marzban, H. (2016). Evaluation of the efficiency of financial policy in the Iran’s economy: with FAVAR pattern approach. *Journal of Quantitative*

Economics (Former Journal of Economic Studies), 13(2), 71-92. (in Persian)

Dargahi, H., & Hadian, M. (2016). Assessing the financial shocks effects by emphasizing the interaction between the balance sheet of the banking system and the real segment of the Iranian economy: DSGE approach, *Journal of Practical Theories of Economics*, *3*(1), 1-28. (in Persian)

Fetras, M., & Maabodi, R. (2016). Financial shocks effect on economic growth and income distribution in Iran: random dynamic general balance approach. *Scientific Research Journal of Practical Economic Studies of Iran, 5*(19), 59-82. (in Persian)

References (in English)

Modigliani, F. (1977). The monetarist controversy or, should we forsake stabilization policies? *American Economic Review, 67*(2), 1-19.

Bernanke, B.S., & Blinder, A.S. (1998). Credit money and aggregate demand. *American Economic Review Papers and Proceedings, 78*(2), 435-439.

Ahmed, B. S., & Ford, J., Agung, s. (2003). Bank behavior and the channel of monetary policy in Japan, 1965-1999. *The Japanese Economic Review, 54*(3), 275.

Mohanty, M. S., & Pturner. B. (2006). Foreign exchange reserve accumulation in emerging markets: What are the domestic implications? *BIS Quarterly Review, Bank for International Settlements, 35*, 39-52.

Gerlach S., & Smets, F. (1995). The monetary transmission mechanism: evidence from the G7 countries. *CEPR Discussion Paper, 1219*.

Mishkin, F. S. (2001). The economics of money, banking, and financial markets. *Columbia University, New York, America.*

Wilbowe, P. (2005). *Monetary policy transmission mechanism and bank portfolio behavior: the case of indonesia*. A Thesis of PhD, Department of Economics, University of Birmingham, Birmingham, England.

Bernanke, B.S., & Gertler, M. (1995). Inside the black box: the credit channel of monetary policy transmission. *Journal of Economic Perspectives, fall, 9*(4), 27-48.

Gertler, M., & Gilehrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. *Quarterly Journal of Economics, 95*, 309-340.

Pagan, A.; Liu, X., & Robinson, T. (2018). Critically assessing estimated DSGE model: a case of a multi- sector model. *Economic Record, 94*(307), 349-371.

Rabanal, P. (2018). An estimated DSGE model to analyze housing market policies in Hongkong SAR. *IMF Working Paper*, *18*(90).

Sebastian, D. (2017). How to promote alternative macroeconomic ideas; are there limits to running with the mainstream pack? *European Journal of Economics and Economic Policies: Intervention, Edward Elgar Publishing*, *14*(2), 238- 249.

Goncalves, C.; Portugal, M., & Aragon, E. (2016). Assessing Brazilian macroeconomic dynamics using a Markov, switching DSGE model. *ECONOMIA, 17*, 23-42.

Smets, F., & Wouters, R. (2003). An estimated dynamic stochastic general equilibrium model of the euro area. *Journal of the European Economic Association, 1*(5), 1123-1175.

Gali, J. (2008). Monetary policy, inflation and business cycle. *Princeton University Press, Princeton, America.*

Christiano, L.; Eichenbaum, M., & Evans, C. (2005). Nominal rigidities and the dynamic effects to a shock of monetary policy. *Journal of Political Economy*, *113*(1), 1-45.

Taylor, J. B. (1993). Discretion versus policy rules in practice. *Carnegie Rochester Conference Series on Public Policy. 39*(1), 195-214.

Allegret, J. P., & Benkhodja, M. T. (2015). External shocks and monetary policy in an oil exporting economy (algeria). *Journal of Policy Modeling, 37*, 652-667.

Bao, Y.; Lim, G., & Li, S. (2009). A small open economy DSGE model with a housing sector. *Department of Economics the University of Melbourne, Melbourne, Australia.*

Burriel, P.; Jesus, F.V., & Juant. R. (2010). Media: a DSGE model for the spanish economy. *Journal of Spanish Economic Association, 1*(1), 175-243.

Canova, F. (2017). Methods for applied macroeconomic research, *Princeton University Press, Princeton, America*.

Gerali, A.; Neri, S.; Sessa, L., & Signoretti, F. M. (2008). Credit and banking in a DSGE model. *Bank of Italy: Working paper.*

Wren Lewis, S. (2016). Blanchard on DSGE. *Mainly Macro*. Available at https://mainlymacro.blogspot.com, Accessed 12 August 2016.

Application of Matching Theory in Finance; Market Design with the Purpose of Corporate Finance at Different Stages of Life Cycle Based on the Matching Theory

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Extended Abstract

1- INTRODUCTION

Many markets do not act like commodity markets. in commodity allocations, the price does all the work (clears the market) and the market's task is to discover the price; but even in parts of the financial markets where the price clears the market, the market's task goes beyond price discovery. this study answers the key question "how can market design theory (with emphasis on matching theory) helps to solve corporate finance issues?" firstly, market failures and missing market in the field of financing are identified in accordance with the firms' life cycle (based on the classification of organization for economic cooperation and development (2013): start-up, early stage, expantion and stabilisation). then, through combination of the theoretical foundations in the field of matching theory with the realities of financing, the theoretical model for problem-solving is presented. in the next step, this theoretical model is presented in the form of conceptual models to determine how to use the capabilities of market design theory and matching theory in solving problems in the field of corporate finance.

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2- THEORETICAL FRAMEWORK

Matching theory can be considered as the most important part of market design theory. this theory, which is used in different markets, requires the presence of two elements of supply and demand, each of which presents a list of preferences in different ways, and then the theory of matching and its mechanism enters and brings the two parties in the market together by a matchmaker.

3- METHODOLOGY

Considering that the subject of the research is under behavioral economics, the methodology of the present research is in the framework of market design theory. in a general context, the application of matching theory is the research method. for this purpose, firstly, market failures and missing market in the field of financing are identified in accordance with the firms' life cycle. then, based on it, a theoretical model in the form of conceptual models is presented to determine how to use the capabilities of market design theory and matching theory in solving problems in the field of corporate finance. in this regard, the limitation of corporate financing methods in accordance with the life stages of companies in order to identify market participants, examination of the characteristics of financial allocations and also determination the assumptions of algorithms design have been considered.

4- RESULTS & DISCUSSION

The results show that there is "market failure" in cash financing of beginner companies (start-up and early stages) and "missing market" in non-cash financing of mature companies (expansion and stabilization stages). Therefore, based on it, three conceptual models including a conceptual model of cash financing (exchange of company with financial source or F-C model) and two conceptual models of barter (exchange of company with company or C-C model) - in terms of one-sided or two-sided market - are designed. the F-C model was designed to achieve matchmaker's goal of providing "cash" financing for beginner companies (start-up and early stages) to use as working capital or as financial support for the company's new and development

projects. the C-C model was designed to achieve the matchmaker's goals of barter for developed companies (expansion and stabilization stages). these conceptual models differ significantly in the parties' goals for presenting in the market (cash financing or increasing the liquidity of the portfolio), the identity of the market parties (mature companies or beginner companies), the case of trade (assets or cash), and the type of trade (barter or cash). the limitations of financing methods and tools in the conceptual F-C model and its dependent algorithms, the study of the characteristics of financial allocations and their reflection as general and specific assumptions of the design and application of each algorithm, were also emphasized.

5- CONCLUSIONS & SUGGESTIONS

With emphasis the stability of algorithm outputs, four algorithms were proposed to improve financial allocations in corporate financing: 1) decisive acceptance algorithm in one-to-one allocation (two-sided matching) for cash financing of beginner companies was presented. 2) deferred acceptance algorithm in many-to-many allocation (two-sided matching) for cash financing of beginner companies, based on the gale-shapley SMP algorithm and its developments with emphasis on the algorithm redesigned by roth in 2008 (as the basic algorithm), was suggested. 3) deferred acceptance algorithm in one-to-one allocation (two-sided matching) for barter financing of mature companies, which was proposed based on Gale-Shapley SMP algorithm and its developments. 4) SRP algorithm in one-to-one allocation (one-sided matching) for barter financing of mature companies, which irving’s 1985 SRP algorithm and its developments were proposed as the basic algorithm for redesign.

Keywords: Market design, Matching theory, Financing instruments, corporate finance, corporate life cycle

References (in Persian)

Abujafari, R., & Kanani, M. (2016). *Requirements for comprehensive development of venture capital (emphasis the experiences of Iran and other countries)*. Research center of the islamic consultative assembly, deputy of

infrastructure research and production affairs, office of communication studies and new technologies (department of new technologies), 14812-14798. [In Persian].

Ebadi, J.; Elahi, N.; Amirzargar, M. A., & Molabeigi, J. (2017). *Mechanism design for kidney transplant in Iran*. iranian journal of applied economic studies, *6*(24), 95-123. [In Persian].

Jalili Kamju, S. P. (2016). *Application of mechanism design theory and matching theory in water market design: An institutional approach to economics and modeling*. quarterly journal of economic research of shahid beheshti university, *7*(26), 53-80. [In Persian].

Malek-al-Sadati, S. S. (2019). *Report on financing costs in Iran and ways to reduce it in industries.* khorasan razavi chamber of commerce, mining and agriculture. [In Persian].

Molabeigi, J. (2019). *Sustainability in market design theory based on Shapley value method.* quarterly journal of economic research, *24*(79), 143-176. [In Persian].

Molabeigi, J.; Ebadi, J., & Amirzargar, M. A. (2018). *Mechanism Design for an efficient kidney transplant market in Iran.* quarterly journal of economic research (sustainable growth and development), *18*(4), 1-30. [In Persian].

Nasiri Aghdam, A.; Rezaei, M. J., & Movahedi Beknazar, M. (2014). *Market design; Roth analytical framework in understanding market performance*. quarterly journal parliament and strategy, *21*(79), 123-151. [In Persian].

Nemati Kheirabadi, S. M. (2021). *Market Design with the Purpose of Corporate Finance at Different Stages of Life Cycle-Based on the Matching Theory*. Ph. D Thesis, Edalat University. [In Persian].

References (in English)

Abdulkadiroglu, A., & Andersson, T. (2022). *School choice*, National Bureau of Economic Research, NBER Working Paper, 29822.

Ashlagi, I., & Roth, A. E. (2021). *Kidney exchange: An operations perspective,* Management Science, 67(9), 5455-5478.

Bublitz, A.; Fraunholz, C.; Keles, D., & Zimmermann, F. (2018). *A survey on electricity market design: Insights from theory and real-world implementations of capacity remuneration mechanisms,* Econstor. 27.

Bulow, J., & Klemperer, P. (2009). *Why do sellers (usually) prefer auctions?* American Ecinomic Review, 99(4), 1544-75.

Cramton, P. (2010). *Market design: Harnessing market methods to improve resource allocation.* American Economic Association, Ten Years and Beyond: Economists Answer NSF's Call for Long-Term Research Agendas.

De Laat, J., & Jack, W. (2010). *Adverse selection in the labor market: Earnings and exit of high skilled Ethiopian physicians.* working paper, Georgetown University, October 2010.

Doval, L., & Skreta, V. (2020). *Mechanism design with limited commitment.* working paper, Columbia University, August 2020.

Gale, D., & Shapley, L. S. (1962). *College admissions and the stability of marriage.* The American Mathematical Monthly, 69(1), 9-15.

Irving, R. W. (1985). *An efficient algorithm for stable roommates' problem.* Journal of Algorithms, 6, 577-595.

Kominers, S. D.; Teytelboym, A., & Crawfird, V. P. (2017). *An invitation to market design.* Oxford Review of Economic Policy, 33(4), 541-571.

Niederle, M., & Roth, A. E. (2007). *The effects of a centralized clearing house on job placement, wages, and hiring practices.* national bureau of economic research working paper series, 13529.

OECD. (2013). Policies for seed and early-stage finance.

Roth, A. E.; Pathak, P. A., & Abdulkadiroglu, A. (2005). *The New York City high school match.* Scholarly Articles 2562765, Harvard University, Department of Economics.

Roth, A. E. (1984). *The evolution of the labor market for medical interns and residents: A case study in game theory*. Journal of Political Economy, 92, 991-1016.

Roth, A. E. (2008). *Deferred acceptance algorithms: History, theory, practice, and open questions,* International Journal of Game Theory, 36, 537-569.

Roth, A. E. (2010). *Market design: understanding markets well enough to fix them when they're broken,* american economic association. ten years and beyond: economists answer NSF.

Roth, A. E. (2018). *Marketplaces, markets, and market design.* American Economic Review, 108(7), 1609-1658.

Roth, A. E., & Peranson, E. (1999). *The redesign of the matching market for american physicians: some engineering aspects of economic design.* American Economic Review, 89(4), 748-780.

Staudt, P.; Gärttner, J., & Weinhardt, C. (2017). *Electricity and telecommunication markets: a discussion of market designs.* European Energy Market (EEM) Conference, June 2017.

Investigating the moderating role of tax avoidance on the relationship between corporate reputation and implicit cost of capital

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Extended Abstract

1- INTRODUCTION

Company executives are trying to take steps to reduce their income tax, and one of the measures that may be taken to reduce taxes payable and increase post-tax revenue is to use a solution called tax avoidance. For this reason, tax avoidance creates a cloud of information environment and creates information asymmetries related to the company's reputation among investors. In other words, tax avoidance causes asymmetry in corporate reputation information and affects capital costs. So reputable companies strive to provide high quality financial reporting. Tax avoidance disrupts the information environment and creates information asymmetries related to the company's reputation among investors. Therefore, it is expected that the relationship between firm reputation and implicit cost of capital is different in companies that use tax avoidance. Therefore, the purpose of this study is to investigate the moderating role of tax avoidance on the relationship between firm reputation and implicit cost of capital.

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2- THEORETICAL FRAMEWORK

From the following two perspectives, tax avoidance as a moderating role is expected to affect the relationship between firm credit and the implicit cost of capital. First, a company's reputation is affected by tax planning, and tax avoidance is likely to negatively affect a company's reputation. When examination how tax avoidance affects the relationship between a firm's reputation and the cost of capital, tax avoidance interferes with the information environment and asymmetry of investors. Second, reputable companies strive to provide high quality financial reporting. In the case of tax avoidance, financial reporting is possible, even if the quality of accounting information is unclear. Therefore, tax avoidance is expected to cause asymmetry in corporate reputation information and affect capital costs.

3- METHODOLOGY

The statistical sample of the research includes 120 companies listed on the Tehran stock exchange, which has been studied during the years 1392 to 1398. the dependent variable of research is the implicit cost of capital and the independent variable is company reputation and the moderator variable isf tax avoidance. in this research, in order to collect data and information, the library method has been used. the information required by the companies has also been collected through the new rahavard software, the official website of the stock exchange organization and the reports of the board of directors. finally, the data were prepared by using excel software and then final analysis was performed by using ives software.

4- RESULTS & DISCUSSION

Findings show that there is a negative and significant relationship between company reputation with implicit cost of capital and tax avoidance with implicit cost of capital. also, tax avoidance as a moderator affects the relationship between corporate reputation and the implicit cost of corporate capital. also, research findings show that more famous companies have lower capital costs, because high reputation indicates better company quality, proper transfer of competencies and doing business in accordance with the interests of shareholders. the company's reputation is affected by tax planning.

in other words, when a company becomes involved in tax avoidance, it has a negative impact on the company's reputation. therefore, tax avoidance is expected to cause asymmetry in corporate reputation information and affect capital costs.

5- CONCLUSIONS & SUGGESTIONS

It can be said that the implicit cost of capital plays a key role in managers' decisions. in fact, without knowing the cost of capital, the company can not decide what tools to use to raise the funds needed for its investments, and because of resource constraints, economic units should choose a combination of financial resources. to this end, managers, as representatives of shareholders and stakeholders, should try to regulate the capital structure of the company in such a way that the implicit cost of the company's capital is minimal and as a result, the company's reputation and shareholder wealth are lost. reputable companies are more inclined to reduce the implicit cost of capital, because reputation plays an important role in determining behavior, and by increasing the company's reputation, the firm's stability increases and sustainable management is possible. the effective tax rate has a positive and significant relationship with the cost of the company's capital. the reason for this can be said that managers pay more attention to tax reduction of financial statements, which in most listed companies, tax avoidance is done through tax rates. the company's reputation is affected by tax planning. in other words, when a company becomes involved in tax avoidance, it has a negative impact on the company's reputation. therefore, tax avoidance is expected to cause asymmetry in corporate reputation information and affect capital costs. hence, reputable companies strive to provide high quality financial reporting.

Keywords: Tax Avoidance, Corporate Reputation, Implied Cost of Capital.

References (in Persian)

Ahmadpour, A.; Kashanipoor, M.; & Shojaei, M. (2010). The effect of Corporate Governance, and Audit Quality on Cost of Debt Financing. *Accounting and Auditing Review*, 17(4), 17-48. [In Persian].

BekhradiNasab, V.; & Zholanezhad, F. (2018). The Effect of the Company Reputation on Cost of Equity. *Quarterly journal of Industrial Economic Researches*, 2(5), 51-60. [In Persian] .

Hazrati, M.; Rostami, W.; & Ghorbani, B. (2018). Corporate social responsibility and reputation. *Quarterly Journal of Management and Accounting Studies*. 4 (2), 223-232. [In Persian].

Hosayni, S.; Ganji, H.; eskandari, G.; & SoltanPour, H. (2021). The Effects of Enterprise Risk Management (ERM) and Audit Committee Characteristics on the Firms' Reputation. *Empirical Research in Accounting*, 11(2), 99-136. [In Persian].

Jafari, H. (2019). Company Reputation and Cost of Equity Capital: Evidence from the Stock Exchange. Fifth International Conference on Management and Accounting, Tehran P [In Persian].

Khalili Araghi, M.; & Fathi Moghanlu, K. (2010). The Impact of Computer Utilization on Human Resource Productivity in Industrial Administrative Section. *Journal of Development & Evolution Mnagement*, 1389(4), 53-60. [In Persian].

Mohammadi, Y.; Mohamadi, A.; & Esmailikia, G. (2020). The Investigation of the Long-Run and Short-Run Effects of Macroeconomic Variables on Companies Capital Cost. *Financial Management Strategy*, 8(3), 119-146. [In Persian].

Mohammadzadeh Saleteh, H.; Abizi, I.; & Mohabelipour, M. (2020). The effect of social capital on the cost of capital with emphasis on information asymmetry. *Financial Accounting and Auditing Research*, 12 (46), 203-232 [In Persian].

Rezaei Pitenoei, Y.; Gholamrezapoor, M.; Kazemi, S.; & Amirniya, N. (2021). Investigation of Moderating Role of Family Ownership on the Relationship Between Corporate Social Responsibility and Tax Avoidance: Testing the Theory of Socioemotional Wealth and Agency Theory. *Journal of Financial Accounting Research*, 13(1), 45-66 [In Persian].

Tahmasebi, S.; Eivani, F., & Ardeshiri, J. (2021). An investigation of the interaction relationship between Corporate Reputationand Financial

Performance by the simultaneous equation method (3SLS). *Management Research in Iran*, 22(1), 119-141 [In Persian].

References (in English)

Anginer, D.; Mansi, S.; Warburton, A. J.; & Yildizhan, C. (2011). Firm reputation and cost of debt capital.

Austin, C. R.; & Wilson, R. J. (2017). An examination of reputational costs and tax avoidance: Evidence from firms with valuable consumer brands. The Journal of the American Taxation Association, 39(1), 67-93.

Balakrishnan, K.; Blouin, J. L.; & Guay, W. R. (2019). Tax aggressiveness and corporate transparency. The Accounting Review, 94(1), 45-69.

Byun, H. Y.; Kwak, S. K.; & Hwang, L. S. (2008). The implied cost of equity capital and corporate governance practices. Asia-Pacific Journal of Financial Studies, 37(1), 139-184.

Cao, Y.; Myers, L. A.; & Omer, T. C. (2012). Does company reputation matter for financial reporting quality? Evidence from restatements. Contemporary Accounting Research, 29(3), 956-990.

Choi, T. H. (2012). Do ethical companies have lower implied cost of equity capital? Evidence from the Korean stock market. Asian Business & Management, 11(2), 219-246.

Chen, S.; Chen, X.; Cheng, Q.; & Shevlin, T. (2010), Are family firms more tax aggressive than nonfamily firms? Journal of Financial Economics, 95(1), 41-61.

Cowen, A.; Groysberg, B.; & Healy, P. (2006). Which types of analyst firms are more optimistic? Journal of Accounting and Economics, 41(1-2), 119-146.

Cook, K. A.; Moser, W. J.; & Omer, T. C. (2017). Tax avoidance and ex ante cost of capital. Journal of Business Finance & Accounting, 44(7-8), 1109-1136.

Dyreng, S. D.; Hoopes, J. L.; & Wilde, J. H. (2016). Public pressure and corporate tax behavior. Journal of Accounting Research, 54(1), 147-186.

Francis, J.; LaFond, R.; Olsson, P. M.; & Schipper, K. (2004). Costs of equity and earnings attributes. The accounting review, 79(4), 967-1010.

Gallemore, J.; Maydew, E. L.; & Thornock, J. R. (2014). The reputational costs of tax avoidance. Contemporary Accounting Research, 31(4), 1103-1133.

Gantyowati, E.; Rohman, A.; Achmad, T.; & Setiawan, D. (2022). Reputation-Based Disclosure and Cost of Capital: The Role of Controlling Ownership. International Journal of Business and Society, 23(1), 359-370.

Goh, B. W.; Lee, J.; Lim, C. Y.; & Shevlin, T. (2016). The effect of corporate tax avoidance on the cost of equity. The Accounting Review, 91(6), 1647-1670.

Graham, J. R.; Hanlon, M.; Shevlin, T.; & Shroff, N. (2014). Incentives for tax planning and avoidance: Evidence from the field. The Accounting Review, 89(3), 991-1023.

Hsieh, T. Y.; Shiu, Y. M.; & Chang, A. (2019). Does institutional ownership affect the relationship between accounting quality and cost of capital? A panel smooth transition regression approach. Asia Pacific Management Review, 24(4), 327-334.

Jackson, A. R. (2005). Trade generation, reputation, and sell-side analysts. The Journal of Finance, 60(2), 673-717.

Kim, I.; Kim, J.; & Kang, J. (2020). Company reputation, implied cost of capital and tax avoidance: Evidence from Korea. Sustainability, 12(23), 9997.

Larcker, D. F.; & Richardson, S. A. (2004). Fees paid to audit firms, accrual choices, and corporate governance. Journal of accounting research, 42(3), 625-658.

Lanis, R.; & Richardson, G. (2011). The effect of board of director composition on corporate tax aggressiveness. Journal of accounting and Public Policy, 30(1), 50-70.

Lambert, R.; Leuz, C.; & Verrecchia, R. E. (2007). Accounting information, disclosure, and the cost of capital. Journal of accounting research, 45(2), 385-420.

Merton, R. C. (1987). A simple model of capital market equilibrium with incomplete information.

Noor, R. M.; Fadzillah, N. S. M.; & Mastuki, N. A. (2010). Corporate tax planning: A study on corporate effective tax rates of Malaysian listed companies. International journal of trade, economics and finance, 1(2), 189.

Purwaka, A. J.; Firmansyah, A.; Qadri, R. A.; Dinarjito, A.; & Arfiansyah, Z. (2022). Cost of capital, corporate tax plannings, and corporate social responsibility disclosure. Jurnal Akuntansi, 26(1), 1-22.

Richardson, G.; Taylor, G.; & Lanis, R. (2013). The impact of board of director oversight characteristics on corporate tax aggressiveness: an empirical analysis. Journal Accounting Public Policy, 32(3), 68-88.

Zhaoxia Xu, (2020). Economic policy uncertainty, cost of capital, and corporate innovation. Journal of Banking & Finance, 111, 105698.

The Effect of Economic, Financial and Political Risk on the Risk and Return of Tehran Stock Exchange

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1- INTRODUCTION

One of the important factors that investors consider in their decision is the return and risk of the stock market. During the last three decades, Iran has faced many risks at the macro-level of society. Increasing economic, financial and political risk affects the level of activities and efficiency of markets. A review of studies of the influence of risk on return and risk Tehran Stock Exchange shows that a comprehensive study to investigate the effect of political, economic, and financial risk with capital markets has not been done. Therefore, this study seeks to answer the question of whether political, economic, and financial risks affect stock risk and return? Which risk has the greatest impact on stock market risk and return? This study tries to examine the effect of political, economic, and financial risks on stock risk and return.

2- THEORETICAL FRAMEWORK

Economic risk is a tool for assessing a country's economic strengths and weaknesses. Financial risk is a tool to assess a country's ability to pay its costs. Financial risk is a measure of a country's ability to formally finance, trade, and trade liabilities. Political risk is often defined as the undesirable risk of political events.

Increasing economic and financial risk affects the stock market through different channels: 1. Impact on investors' expectations and consequently

change in the current value of investment projects, change in profit flow or change in the value of assets of firms admitted to the stock market 2. Engaging the non-productive sectors and thus changing liquidity flows 3. Changes in international financial flows affect the stock market.

Political risk can also affect the stock market through the following channels: 1. Changing economic outlook and consequently changing the trust and behavior of consumers and investors that change the demand and performance of markets 2. Political and social protests as a result of any change of government 3. Changing political parties and consequently changing policymakers' positions on legislation for working-class or upper-class voters 4. Supporting some industries or geographical areas 5. Change in foreign direct investment 6. Affecting the quality and structure of institutions causes instability in prices and market performance.

Many studies have been done in this field. For example, Heidari et al. (2015) studied macroeconomic variables affecting the volatility of stock returns on the Tehran Stock Exchange in different regimes using a nonlinear approach to change the Markov ARMA GARCH multivariate regime. Their results show that the growth rate of GDP has a significant negative effect on the volatility of stock returns. Inflation, money growth rate and exchange rate volatility have a positive and significant effect on different regimes, but oil price volatility has different effects on stock price volatility.

Zolfaghari and Sahabi (2016) investigated the effect of exchange rate fluctuations on stock return risk based on Markov regime transfers. The results showed that the industry efficiency index follows regime transitions and responds asymmetrically to external shocks. Also, the risk of return on industry indices are significantly affected by exchange rate fluctuations in the short and long term.

The difference between this study and previous studies is that, firstly, none of these studies have examined three types of risks (economic, financial, and political) on the Tehran Stock Exchange simultaneously. Second, most studies have considered the relationship between economic and financial variables and the stock market, and few studies have been conducted on financial and economic risks on the stock market.

3- METHODOLOGY

In this research, financial, political, and economic risk indicators in the framework of structural VAR for the period 2008-2019 have been used seasonally. For stock market risk in the form of conditional variance GARCH model is used. The advantage of the SVAR model, unlike the VAR model, is that it has an economic logic based on economic theories.

4- CONCLUSIONS & SUGGESTIONS

The results of the Impulse response functions show that as the economic risk decreases, the stock return risk decreases. But the political and financial risk index has little effect on stock return risk. In other words, stock market risk is more affected by economic variables and political and financial variables have not been able to have much effect on market risk. Also, reducing financial risk has increased stock returns, but the impact of economic risk is first negative and then positive. The effect of political risk on stock market returns is volatile and negligible. The effect of stock market risk on market returns is positive. The results of analysis of variance also show that the economic risk index had the most explanations in stock market return and risk.

In general, the Tehran Stock Exchange market is more affected by economic variables and financial and political variables have little effect on this market. Therefore, macroeconomic policy-making seems necessary to reduce economic risk.

Keywords: Economic Risk, Financial Risk, Political Risk, Stock Market Risk and Return

References (in Persian)

Aghaei, M.; Kouhbor, M., & Ahmadinejad, H. (2018). Financial Stability and Economic Performance: The Case of OPEC Countries. *Journal of Economics and Modeling*, *9*(2), 29-65. (in Persian)

Ansari Samani, H.; Mahmudi, Z., & Namdari, S. (2017). The Relationship between Risk and Foreign Direct Investment in Selected

Developing Countries (Dynamic Panel Data Approach). *The Journal of Economic Studies and Policies*, *3*(2), 71-104. (in Persian)

Googerdchian, A., Fathi, S., Amiri, H., & Saeidi Varnamkhasti, N. (2015). Comparing Analysis, the Effect of Political Riske on Stock Market Developing in Selected Countries. *Journal of Investment Knowledge*, 4(15), 135-156. (in Persian)

Heidari, H.; Refah-Kahriz, A., & Hashemi Berenjabadi, N. (2018). Dynamic Relationship between Macroeconomic Variables and Stock Return Volatility in Tehran Stock Exchange: Multivariate MS ARMA GARCH Approach. *Quarterly Journal of Applied Theories of Economics*, *5*(2), 223-250. (in Persian)

Jalaei, S.; Mir, H., & Rahimipour, A. (2015). The impact of good governance on stock returns in Tehran Stock Exchange. *Financial Knowledge of Securities Analysis*, *8*(27), 1-13. (in Persian)

Jalali, O.; Ansari Samani, H., & Hatefi Madjumerd, M. (2017). The Effect of Political Risk on Foreign Direct Investment in Iran. *Economic Growth and Development Research*, *8*(29), 157-174. (in Persian)

Kazerroni, A.; Asgharpour, H., & nafisi, M. (2019). An Investigation of the Effects of Political Stability on Economic Growth in Iran: A Quantile Resression Approach. *Strategic Studies of public policy*, *9*(31), 39-58. (in persian)

Keshavarz, H., & Rrezaei, M. (2022). Political, Financial and Economic Instability in the Iran Economy: Dimensions and Factors. *International Political Economy Studies*, *4*(2), 691-724. (in Persian)

Mehrara, M.; Heidari Zahiri, N., & Falahati, Z. (2014). Investigation of the Relationship Between Systematic Risk and Stock Returns in Tehran Stock Exchange (From 1387 to 1392) Using the Capital Asset Pricing Model (CAPM). *Economic Development Policy*, *1*(1), 67-91. doi: 10.22051/edp.2014.60. (in Persian).

Mirabbasi, Y.; Nikoumaram, H.; Saeidi, A., & Haghshenas, F. (2018). Study of portfolio optimization based on downside risk, upside potential and behavioral variables efficiency. *Financial Engineering and Portfolio Management*, *9*(34), 305-333. (in Persian)

Nahidi Amirkhiz, M. (2013). The Relationship between Economic Instability with Economic and Social Development in Iran. *Sociological studies*, *6*(20), 115-128. (in Persian)

Ostadifar, S. (2015). *The Effect of Macroeconomic Beta on Stock Market Beta in Selected Islamic countries*. Master Thesis, Faculty of Economics, University of Tabriz. (in Persian)

Qaracheh, M.; Alam Tabriz, A., & Pazaki, M. (2012). Investigation of the Application of Arbitrage Pricing Theory (APT) Using Macroeconomic Variables in Tehran Stock Exchange. *Financial management perspective*. (4) 1, 79-59. (in Persian)

Raei, R., & Talangi, A. (2004). *Advanced investment management.* Tehran, The Organization for Researching and Composing University textbooks in the Humanities. (in Persian)

Rahmani, A., Peikarjoo, K., & Azizi, M. (2014). The relationships between market beta with macroeconomic variables and accounting information. *Journal of Investment Knowledge*, *3*(10), 47-66. (in Persian)

Rezaei, Q.; Shahrestani, H.; Hozhabre Kiani, K., & Mehrara M. (2019). The Impact of Monetary Policy on the Stock Market Returns and Instability: Comparison of Monetary Policy Tools in Iran. *Journal of Economic Modeling Research*.; *10*(36) :75-126. (in Persian)

Shahabadi, A.; Naziri, M. K., & Havaj, S. (2013). The Effect of Macroeconomic Variables on Systematic Risk of Tehran's Stock Exchange. *Journal of Economic Research and Policies*, 21 (67) , 89-104. (in Persian)

Shahabadi, A., & Bahari, Z. (2014). Effect of Political Stability and Economic Freedom on the Economic Growth in Selected Developed and Developing Countries. *Economic Growth and Development Research*, 4(16),72-53. (in Persian)

Tehrani R., Seyed Khosrowshahi, S. A. (2017). Transmission of volatility and the interaction of stock, currency and gold markets. *Journal of Financial Management Perspective*, 7(18), 9-32. (in Persian)

Zolfagari, M., & Sahabi, B. (2016). The Effect of Exchange Rate Fluctuations on the Stock Return Risk of Mining, Automotive and Cement

Index based on the Regime Transmission of Markov. *Financial Engineering and Portfolio Management*, 7(29), 85-106. (in Persian)

References (in English)

Abbas, G.; Bashir U., & Wang S. (2018). The Return and volatility Nexus Among Stock Market and Macroeconomic Fundamentals for China, *Physica A*, https://doi.org/10.1016/j.physa.2019.04.261

Abbas, G., & McMillan, D. G. (2014). Interaction Among Stock Prices and Monetary Variables in Pakistan. *International Journal of Monetary Economics and Finance*, *7*(1), 13-27.

Abouwafia, H. E., & Chambers, M. J. (2015). Monetary policy, exchange rates, stock prices in the Middle East region. *International Review of Economics and Finance*, *37*(3), 14-28.

Al-Mahmoud, A. I. (2014). Country Risk Ratings and Stock Market Movemwnts: Evidence from Emerging Economiy. *International Journal of Business and Finance*, *6*(10), 88-96.

Antonakakis, N.; Breitenlechner, M., & Scharler, J. (2015). Business Cycle and Financial Cycle Spillovers in G7 countries. *The Quarterly Review of Economics and Finance*, *58*(4), 154- 162.

Antonakakis, N., & Badinger, H. (2016). Economic Growth, Volatility and Cross-Country Spillovers: New Evidence for the G7 countries. *Economics Modeling*, 52(1), 352-365.

Asteriou D., & Sarantidis, A. (2016). Political instability and Stock Market Returns: Evidence from OECD countries. *Economics and Business Letters*, *5*(4),113-124, 2016

Beaulieu M. C.; Cosset, J. C., & Essaddam, N. (2005). The Impact of Political Risk on the Volatility of Stock Returns: The Case of Canada. *Journal of International Business Studies*, Vol. 36, No. 6 (Nov., 2005), pp. 701-718

Ben Ghozzi, B., & Chaibi, H. (2021). Political risks and Financial Markets: Emerging Vs Developed Economies. *EuroMed Journal of Business*. https://doi.org/10.1108/EMJB-11-2020-0123

Bhuiyan, E. M., & Chowdhury M. (2019). Macroeconomic Variables and Stock Market Indices: Asymmetric Dynamics in the US and Canada.

Quarterly Review of Economics and Finance doi: https://doi.org/10.1016/j.qref.2019.10.005

Chau, F.; Deesomsak, R., & Wang, J. (2014). Political Uncertainty and Stock Market Volatility in the Middle East and North African (MENA) Countries, *Journal of International Financial Markets, Institutions and Money*, vol. *28*(C), 1-19.

Chen Z.; Lu Andrea Y., & Yang Z. (2017). Growing Pains: International Instability and Equity Market Returns. Financial Management, *Financial Management Association International*, *46*(1), 59-87.

Cooley, T. F., & Leroy, S. F. (1985). A Theoretical Macroeconomics: A Critique. *Journal of Monetary Economics*, 16, 283-308.

Darabi, R., & Ali Farahi, M. (2010). The effect of macroeconomic variables on risk and total stock returns with emphasis on the stock return-inflation model. *Financial Accounting and Auditing Research*, (7) 2, 169-141. (in Persian)

Darini, V. M.; Esmaeilpour Moghadam, H., & Vahid, D. (2016). Analyzing the Effect of Political Instability on International Business Based on Geopolitical Situation of Iran, *Quarterly Journal of Political Research in Islamic World* 6 (3) ,101-119.

Diebold, F. X., & Yilmaz, K. (2009). Measuring financial Asset Return and Volatility Spillovers, with Application to Global Equity Markets. *The Economic Journal*, *119*(1), 158-171.

Diebold, F. X., & Yilmaz, K. (2012). Better to Give Than to Receive: Predictive directional measurement of volatility spillovers. *Internation Journal of Forecasting*, *28*(1), 57-66.

Diebold, F. X., & Yilmaz, K. (2014). On the network topology of variance decompositions: Measuring the connectedness of financial firms. *Journal of Econometrics*, *182*(1), 119- 134.

Masrizal Miftahurrahman, M.; Sri, H., & Yayan F. (202.). The effect of country risk and macroeconomic on Jakarta Islamic Index, *Journal of Islamic Economics and Business*, *6*(1):151

Ben Moussa, F., & Talbi, M., (2019). Stock Market Reaction to Terrorist Attacks and Political Uncertainty: Empirical Evidence from the

Tunisian Stock Exchange, *International Journal of Economics and Financial Issues, Econjournals,* 9(3), 48-64.

González M.; Nave J., & Rubio G. (2017). Macroeconomic determinants of stock market betas. *Journal of Empirical Finance* (2017), https://doi.org/10.1016/j.jempfin.2017.10.003

Guo Y.; Li J.; Li Y., & You. W. (2021) The roles of political risk and crude oil in stock market based on quantile cointegration approach: A comparative study in China and US, *Energy Economics*, 97(C), 1-24

Idris Muhammed, Y. (2015). Social Instability, Policy Uncertainty, and Financial Risk Evidence from the Egyptian Exchange and Borse de Tunis, *MEI WORKING PAPER* 2015-02JUNE 2015

Khan Sh.; Baig N.; Usman M.; Shaique M., & Shaikh R. (2017) Stock Market Dynamics in Pakistan: What Do Political Events and Budget Announcements Disclose? *Research Journal of Finance and Accounting, 8*(10)-113-123, 2017

Lütkepohl, H., & Poskitt, D. S. (1991). Estimation of orthogonal impulse responses via vector autoregressive models. *Econometric Theory*, 487-496.

Lütkepohl, H. (2005). *New introduction to multiple time series analysis*. Berlin, Springer. ISBN: 3540262393

Mei, J., & Guo, L. (2004). Political Uncertainty, Financial Crisis and Market Volatility, *European Financial Management Association*, 10(4), 639-657.

Mnif A. T. (2017). Political uncertainty and behavior of Tunisian stock market cycles: Structural unobserved components time series models. *Research in International Business and Finance*. 39, 206-214

Montes G. C., & Tiberto B. P. (2012). Macroeconomic environment, country risk and stock market performance: Evidence for Brazil. *Economic Modelling*, 29, 1666–1678

Numan Ü., & Saleh B. (2013) Country world betas: The link between the stock market beta and macroeconomic beta. *Finance Research Letters*. *11*(1), 36-46

Pindyck, R. S. (1984). Risk, Inflation, and the Stock Market. *The American Economic Review*, 74(3), 335-351.

Wei, Y.; Songkun, Q.; Xiafei, L.; Sha, Z., & Guiwu, W., (2019). Oil Price Fluctuation, Stock Market and Macroeconomic Fundamentals: Evidence from China before and after the financial crisis, *Finance Research Letters*, doi: https://doi.org/10.1016/j.frl.2019.03.028

The Effect of Exchange Fluctuations on the Petroleum Products Stock Index by using MS-VAR

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Extended abstract

1- INTRODUCTION

Because of the exchange fluctuations in Iranian economy, the capital market has undergone significant changes. the petroleum products stock index has the largest share in the capital market price index compared to currency industries. the present study tries to investigate the impact of the exchange rate crisis on the petroleum products stock index in Tehran stock exchange by using the monthly data of the period of 2009:1-2020:3 and using the nonlinear Markov switching approach.

2- THEORETICAL FRAMEWORK

Due to the high dependence of foreign exchange reserves on the oil foreign exchange receipts (DEXO) and the sharp decline in these receipts, the central bank has faced limitations in supplying the foreign exchange to the market. thus, reducing the currency resources and supplying the foreign

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exchange on the one hand, and the growth of the foreign exchange demand on the other hand, have caused the raise in the exchange rate.

Economic sanctions have always affected the foreign exchange market, the extent of which depends on the severity of the sanctions. the most important reason for the volatile increase in the exchange rate in recent years is the oil and banking sanctions against our country. economic sanctions will significantly reduce the oil and non-oil exports by restricting the purchasing of the trading partners, and through the channel of declining the foreign exchange earnings will lead to a decrease in the supply of the foreign exchange, and consequently a sharp increase in the exchange rate (devaluation of the national currency). now, we turn to the mechanism of transferring the currency crisis to the stock prices.

Changes in the exchange rates can have two different impacts on the stock prices. on the one hand, the increase in the exchange rate (in terms of demand) has led to an increase in the income of the exporting companies (such as refineries, petrochemicals, metals, mining, etc.) and, consequently, their stock prices, and on the other hand (based on the supply), leads to lower profits for the importing companies such as some automotive, pharmaceutical and food industries, as well as the transportation and leads to lower stock prices.

In addition to dividends, stock buyers also pay attention to the changes in the company's intrinsic value. the intrinsic value of industries whose creation and operation require the supply of machinery from abroad, is affected by the exchange rate changes. and if a company imports the machinery at lower exchange rates, the intrinsic value of the company will increase as the exchange rate increases, and this intrinsic increase intensifies when the establishment of a similar company is not possible due to the high exchange rate, and if the company's products are produced exclusively, its demand will increase and the company's profit will be higher over time. on the other hand, the share of depreciation cost of machinery in the cost of goods produced by the company decreases. considering the above cases by investors, the demand for the shares of these companies will increase and this will increase the stock prices of these companies. in addition, if the exchange rate decreases over time, it will cause the opposite effect for these companies.

3- METHODOLOGY

Recently, the use of the nonlinear models in fluctuation studies has expanded because of this assumption that the linearity of the exchange fluctuations is a large and unrealistic limitation for these studies. this pattern is also known as the pattern of the regime change. the regime change means that a policy variable may show a behavior in one period of time and behave differently in another time period. therefore, if this issue is not considered in the study of the behavior of the variable, the biased results will be obtained. markov rotation models, as the nonlinear models, are able to model the behavioral pattern of the changing status of the dependent variable over time. in nonlinear models, it is assumed that the behavior of the variable on which the modeling is performed is differently and changes in different states.
For this purpose, among the various modes of Markov switching model, MSIAH (2) –VAR (2) has been selected.

4- RESULTS & DISCUSSION

The empirical findings of the study show that only in a regime with high fluctuations (first regime), the exchange rate is the causal relationship of the petroleum products stock index and the increase in the exchange rate has increased the petroleum products stock index, while the petroleum products stock index has no impact on the exchange rate. In addition, the results indicate that the sustainability of the petroleum products stock index in the regime with the low fluctuations (second regime) was more than of the regime with the high fluctuations (first regime).

5- CONCLUSIONS & SUGGESTIONS

Due to the results of the present study, there is a one-way relationship between high exchange rate fluctuations and the stock index of petroleum products. investors active in the stock market, in addition to considering how the stock index of petroleum products is affected by other influential domestic variables, should also consider high exchange rate fluctuations and make their decisions. it is suggested that shareholders, in order to benefit from the growth of the capital market index, as soon as the exchange rate rises sharply, buy shares of companies exporting goods, such as refineries, petrochemicals,

metals, mining, etc. also, as soon as the exchange rate falls sharply, sell the shares of the mentioned companies and buy the shares of companies independent of the exchange rate in order not to suffer from the risk of a decrease in the stock index.

Keywords: Markov switching model, Causal relationship, Exchange rate, Petroleum products stock index.

References (in Persian)

Dehghan, A., & Kamyabi, M. (2019). How macroeconomic variables affect the returns of listed companies in the conditions of prosperity and recession in the Iranian capital market. *Journal of Financial Economics*, 13(48), 147-166 (In Persion).

Hallafi, H. R.; Eghali, A. R., & Gaskari, R. (2004). Real exchange rate deviation and economic growth in the Iranian economy. *Economic Research Journal*, 4(3), 167-187 (In Persion).

Heidary, H., & Bashiry, S. (2011). Investigation of the relationship between real exchange rate uncertainty and stock price index in Tehran stock exchange: observations based on VAR-GARCH model. *Economic Modeling Research*, 3(9), 71-92 (In Persion).

Heidary, H.; Mohammadzadeh, Y., & Refahkahriz, A. (2018). Investigation of the impact of exchange rates on the returns of drug industry stocks on the Tehran stock exchange by using the markov switching approach. *Journal of Asset Management and Financing*, 6(2), 35-56 (In Persion).

Mehnatfar, Y.; Derakhshani, K., & Parandin., K. (2016). The impact of oil and currency fluctuations on the stock market price index in Iran: a marginal test approach. *Al-Zahra University Economic Development Policy Quarterly*, 4(2), 133-156 (In Persion).

Najarzadeh, R.; Aghaei, M., & Rezaeipour, M. (2009). Investigation of the effect of fluctuations in currency and price shocks on the stock price

index of Tehran stock exchange by using the vector regression approach. *Journal of Economic Research,* 9(1), 147-175 (In Persion).

Pedram, M. (2012). The effect of exchange rate fluctuations on stock market fluctuations in Iran. *Journal of Financial Knowledge of Securities Analysis*, 5(15), 83-96 (In Persion).

References (in English)

Azman-Saini, W. N. W.; Habibullah, M. S.; Law, S. H., & Dayang-Afizzah, A. M. (2006). Stock prices, exchange rates and causality in Malaysia: a note.

Bhattacharya, B., & Mukherjee, J. (2003, January). Causal relationship between stock market and exchange rate, foreign exchange reserves and value of trade balance: A case study for India. In fifth annual conference on money and finance in the Indian economy.

Branson, W. H. (1981). Macroeconomic determinants of real exchange rates. *NBER Working Paper*, (w0801).

Chkili, W., & Nguyen, D. K. (2014). Exchange rate movements and stock market returns in a regime-switching environment: Evidence for BRICS countries. *Research in International Business and Finance, 31*, 46-56.

Ding, L. (2021). Conditional correlation between exchange rates and stock prices. *The Quarterly Review of Economics and Finance*, 80, 452-463.

Dornbusch, R., & Fischer, S. (1980). Exchange rates and the current account. *The American Economic Review*, *70*(5), 960-971.

Goldfeld, S. M., & Quandt, R. E. (1973). A Markov model for switching regressions. *Journal of Econometrics*, *1*(1), 3-15.

Hamilton, J. D. (1989). A new approach to the economic analysis of nonstationary time series and the business cycle. *Econometrica: Journal of the Econometric Society*, 357-384.

Hamilton, J. D., & Susmel, R. (1994). Autoregressive conditional heteroskedasticity and changes in regime. *Journal of Econometrics*, *64*(1-2), 307-333.

Hau, H., & Rey, H. (2006). Exchange rates, equity prices, and capital flows. *The Review of Financial Studies*, *19*(1), 273-317.

Huang, Q.; Wang, X., & Zhang, S. (2021). The effects of exchange rate fluctuations on the stock market and the affecting mechanisms: evidence from BRICS countries. *The North American Journal of Economics and Finance*, 56, 101340.

Kapetanios, G.; Shin, Y., & Snell, A. (2003). Testing for a unit root in the nonlinear STAR framework. *Journal of Econometrics*, 112(2), 359-379.

Krolzig, H. M. (1998). *Econometric modelling of Markov-switching vector autoregressions by using MSVAR for Ox.*

Liang, C. C.; Lin, J. B., & Hsu, H. C. (2013). Reexamination the relationships between stock prices and exchange rates in ASEAN-5 by using panel granger causality approach. *Economic Modelling*, *32*, 560-563.

Mahapatra, S., & Bhaduri, S. N. (2019). Dynamics of the impact of currency fluctuations on stock markets in India: assessing the pricing of exchange rate risks. *Borsa Istanbul Review*, *19*(1), 15-23.

Markowitz, H. (1959). *Portfolio selection*.

Pavlova, A., & Rigobon, R. (2007). Asset prices and exchange rates. *The Review of Financial Studies*, *20*(4), 1139-1180.

Psaradakis, Z., & Spagnolo, N. (2003). On the determination of the number of regimes in Markov-switching autoregressive models. *Journal of Time Series Analysis*, *24*(2), 237-252.

Subair, K., & Salihu, O. M. (2010). Exchange rate volatility and the stock market: the Nigerian experience. In *Academic and Business Research Institute International Conference*.

Zeinaldiny, SH.; Karimi, M., & Khanzadi, A. (2020). Investigation of the effect of oil price shocks on Iran's stock market performance. *Journal of Financial Economics*. 12(50), 145-169.

Zhao, H. (2010). Dynamic relationship between exchange rate and stock price: evidence from China. *Research in International Business and Finance*, *24*(2), 103-112.

Zhou, S. (2013). Nonlinearity and stationarity of inflation rates: evidence from the euro-zone countries. *Applied Economics, 45(7), 849-856*.