Analysis of the Impact of Financial Deepening on the Shadow Economy in Iran during 4 decades, emphasizing Financial Markets & Financial Institutions

1. Introduction

Financial deepening is defined as an increase in the ratio of a country's financial assets to its GDP. Accumulation of financial assets simultaneously provides credit to finance the accumulation of real assets for the development process. The long-term equilibrium ratio of financial assets to GDP may be expressed as a simple relationship between a country's financial savings ratio and its growth rate. Financial deepening generally refers to growth in the scale of financial transactions in relation to the real economy. This process may also be interpreted as the expansion of the balance of financial assets relative to the real economy. Also, financial deepening is assumed as a variable to increase economic growth. Since Goldsmith's (1969) pioneering findings, much research has been conducted on the relationship between financial deepening and economic growth, these studies have generally shown that the former has a positive effect on the latter. It is predicted that financial deepening will help to reduce income inequality. Recent empirical studies have determined that the deepening of the financial sector promotes innovation.

A developed financial system increases investment, savings and allocation of funds by directing and allocating scarce resources to the most effective opportunities, which leads to increased capital efficiency and thus increased economic growth (Al-Yousif, 2002; King and Levin, 1993; Slesman et al, 2019).

However, various determinants such as shadow economy activities and institutional quality are harmful for financial depth and financial sector performance, especially in developing economies (Hajili and Niroumand, 2021). The shadow economy exists in every economic system, both market and non-market. Traditionally, the shadow economy is considered as part of an invisible economy, which represents all economic activities that are not recorded by the current system of statistical observations or other government and society information sources. Although the relationship between the shadow economy and financial development has already been examined, the question of the relationship between financial deepening and the shadow economy still remains. It is widely accepted that financial deepening provides additional

Public Sector Economics Studies 6 PSE
Qurterly
Department of Economics, Faculty of Social Sciences, Economics and Entrepreneurship, Razi University
Vol. 2, Issue 4, Winter 2024 | Online ISSN: 2821-2681

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benefits to all developed, developing and emerging countries, including stabilizing the financial system by providing more funds and credit to the private sector without distorting asset pricing. Increases A deeper financial market provides a wide range of financial resources for economic growth and development. According to the existing literature, financial deepening can be influenced by major macro variables. Financial deepening has a positive and increasing effect on productivity, investments and economic growth. Also, due to the existence of imperfections in the financial markets and the unfair availability of financial resources and investment opportunities, less deep financial systems can face more volatility. Stronger financial depth leads to less fluctuations in economic growth, consumption and investment rates. Although the relationship between the shadow economy and various economic variables as well as the importance of financial deepening in the entire economy have been examined, the main purpose of this study is to separately investigate the effect of the deepening of financial markets and financial institutions on the size of the shadow economy in Iran for the period of 1980-2020.

2. Materials and Methods

According to the degree of accumulation of variables based on the generalized Dickey-Fuller unit root test and Phillips-Peron unit root test which is reported below, the autoregressive distributed lag approach has been used in specifying the study model. In the model of the present study, the percentage ratio of the shadow economy to the GDP, the deepening index of the financial market (percentage), the deepening index of financial institutions (percentage), the percentage ratio of direct tax to the GDP (direct tax burden) and the index of trade openness are specified.

The basis of the autoregression model with extended intervals (*ARDL*) is the following equation, in which the volume of the shadow economy SE as the dependent variable indicates the volume of the shadow economy, which was calculated through the mimic method. *FMD* and *FID* represent deepening of financial market and deepening of financial institutions, respectively. Also, the control variables of the model include the direct tax burden of *DTAX* and the trade openness degree of *TRADE.*

$$SE_t = \varphi SE_{t-1} + \gamma FMD_{t-1} + \omega FID_{t-1} + \theta DTAX_{t-1} + \alpha TRADE_{t-1} + \sum_{i=1}^{p-1} \varphi_i SE_{t-i} +$$

$$\sum_{i=0}^{q-1} \gamma_i \Delta FMD_{t-i} + \sum_{i=0}^{r-1} \omega_i \Delta FID_{t-i} + \sum_{i=0}^{u-1} \theta_i \Delta DTAX_{t-i} + \sum_{i=0}^{u-1} \alpha_i \Delta TRADE_{t-i} + \varepsilon_t$$

3. Discussion

The long-term estimation results are reported in the table below. The results of the estimated coefficients of the model in the long term are similar to the short term in terms of the sign of the coefficients. According to the table below, the deepening of financial institutions with a coefficient of 0.236 has a positive effect on the shadow economy in the long term. By explaining that an increase of one unit (percentage)

will increase the volume of the shadow economy by 0.236%, it can be acknowledged that at the low level of the deepening of financial institutions, access to financial resources is difficult and costly, so people in the shadow economy seek to find They are an alternative way to finance. At the same time, Iran is a developing country and cannot allocate more resources to the development of its financial institutions (system) and financial institutions do not have the proper efficiency, so financial institutions have not been able to serve the real sector of the economy and investment. Also, the deepening of financial institutions due to the lack of trust and transparency and the structural defects of banks at present cannot lead to economic growth and eventually reduce the size of the shadow economy, but will increase its size. The deepening of financial markets has a negative effect (with a coefficient of -0.30) on the shadow economy. In such a way that an increase of one unit (percentage) in the deepening of financial markets, the shadow economy will decrease by 0.3 percent. In justifying this result, it can be argued that the financial market, as one of the main economic sectors, has a close connection with the shadow economy. It is clear that financial deepening and, in line with that, financial development to the extent that it reduces the cost of credit, will ultimately lead to a higher opportunity cost of the shadow economy. The direct tax burden has a positive effect on the size of the shadow economy in the long term with a significant factor of 1.80. It is obvious that taxes have an effect on choosing the amount of free time of the labor force, and the higher the tax burden, it creates a strong tendency for the labor force to enter the shadow economy. However, the degree of trade openness in the long term does not have a significant effect on the size of the shadow economy.

ARDL model estimation results
(Dependent variable: Shadow Economy)

Prob	t-statistic	Coefficient	Variables	
0.013	2.65	0.236	FID	
0.000	-4.24	-0.30	FMD	long-run estimate
0.000	4.76	1.80	$DTAX$	
0.187	1.35	0.04	$TRADE$	

4. Conclusion

In this study, an attempt has been made to explain the effect of the deepening of financial institutions and financial markets on the size of the shadow economy. For this purpose, the volume of the shadow economy was first calculated using the multiple index-multiple causes method in the time period of 1980 to 2020 and the coefficients were estimated using the autoregressive distributed lag approach. The results of the estimation of the research model have indicated that despite the negative effect of financial markets on the size of the shadow economy in the long and short run, financial institutions have a positive effect on the size of Iran's shadow economy. In connection

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Qurterly
Department of Economics, Faculty of Social Sciences, Economics and Entrepreneur Payk University
Vol. 2, Issue 4, Winter 2024 | Online ISSN: 2821-2681

with the positive effect of the deepening of financial institutions on the size of the shadow economy in Iran, it can be acknowledged that Iran is a developing country and cannot allocate more resources to the development of its financial institutions, and financial institutions do not have the proper efficiency, so financial institutions have not been able to serve the real sector of economy and investment. Also, the deepening of financial institutions due to the lack of trust and transparency and the structural defects of banks at the moment, cannot lead to the growth of the formal sector and ultimately reduce the size of the shadow economy, but will increase its size. Among the control variables of the model, although the degree of trade openness does not have a statistically significant effect in the long run, the direct tax burden will have a positive effect on the shadow economy in the long run.

Based on this and according to the findings of the research, it is suggested that the policy makers pay attention to the following policies:

1. Regulating and amending laws and regulations related to markets and financial institutions in order to increase transparency and public trust, through the creation of appropriate mechanisms for the supervision and monitoring of financial markets, as well as encouraging the release of transparent financial information by companies.

2. Development of information and communication technology infrastructure to increase access to financial services throughout society, through investment in this area and promoting the use of new technologies in providing financial services.

3. Encouraging the creation and development of public and private financial markets in order to increase investment options and reduce risk, by providing financial and tax facilities for companies and organizations active in financial markets.

Also, there is a significant difference in the size of the positive impact of the direct tax burden (about 6 times the deepening of the financial markets) on the size of the shadow economy compared to other model variables. Therefore, direct tax rates should be optimized to control the size of the shadow economy in line with the optimal allocation of resources, redistribution of income and social justice of the country.

5. Conclusion and Suggestions

Based on the results of the research and considering that the price of fuel in the studied countries is lower than the global price of fuel, or in other words, they receive fuel subsidies, the increase in fuel prices in these countries (decrease in fuel subsidies) will cause economic growth in the studied countries. Therefore, taking advantage of policies to deal with price increases and also the government's role in redistributing subsidies can be important in the issue of correcting the fuel price gap.

6. Acknowledgments