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How to Escape the Middle Income Trap in Iran? Lessons from Malaysia, Thailand South Korea and China

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Abstract
In 2010, the World Bank categorized countries by GDP (at Purchasing Power Parity) per capita (at constant 1990 prices) in three categories: low, middle (low and high), and high. If a country falls in a trap at least 28 years in the low middle income and at least 14 years in the high middle income group, then it is included in low and middle income groups, respectively. In this paper, using the experience of successful countries in avoiding the trap, we investigated the impact of investment, human capital, high-tech exports, total factor productivity, exports of goods and services, and the value added of service sectors on per capita GDP growth during 1991-2014, using panel data. Research findings in the literature indicated that in selected Asian countries, human capital and total factor productivity growth with positive and significant effects have the greatest impact on avoiding the trap. In the case of Iran, human capital and the total factor productivity growth have positive and significant effects on the economic growth, but such effects have not been so great to help escaping Iran's economy from the middle- income trap. Therefore, Iran has remained in the middle- income trap over the past 58 years.

Keywords: Middle Income Trap, Economic Growth, Productivity, Human Capital, Education.

JEL Classification: J24, D24, E22, C33.

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1. Introduction

Iran has been trapped in the middle-income level for many years. There is no research on Iran to the best of our knowledge. Therefore, it seems that this study will be the first with using quantitative analysis to explore the determinants of the trapping of Iran and the ways to escape from the middle-income level. Studies on the middle-income trap have investigated this issue qualitatively by comparing the variables for countries, or time series data for a particular country. We examined the issue quantitatively using panel data and comparing the variables for Iran and the four successful East Asian countries.

Since the 1950s, a significant number of countries have achieved middle-income level by a rapid growth and few countries have been able to turn into high-income economies.

Nonetheless, many developing countries are being trapped in what is called the middle-income trap, which is characterized by the slow growth and productivity improvement. The middle- income trap is characterized as the low-growth and sustainable economic equilibrium where talents are falsely allocated and innovation is stagnating. In 2010, there were 40 low-income countries, 38 low-middle income countries, 14 high-middle income countries, and 32 high-income countries worldwide (Felipe, et al., 2012).

Iran with a GDP per capita of US$ 5920 (in 2015) is categorized in the middle-low income group, with 58 years (since 1959) of being trapped in the middle low- income level.

The four countries of Malaysia, Thailand, South Korea, and China, as comparable countries in the study, are categorized in the middle-income countries (Malaysia, Thailand, and China) and high-income countries (South Korea), and have been successful in avoiding the middle- income trap.

Over the past 50 to 60 years, there have been few countries in the world that have been able to upgrade their income from middle-income countries to high-income countries, such as Japan, South Korea and Taiwan.

Among the countries that have been able to avoid this trap in recent decades and reach the high income level are Greece, Hong Kong, Ireland, Japan, Portugal, South Korea, Spain, Austria, Belgium, Sweden, Italy, Singapore, and Taiwan. East Asian countries avoided the trap, by focusing on infrastructure networks, innovation and R & D. These have led the countries to grow rapidly, and to promote from the middle to high income and avoid the trap (Felipe et al., 2012). Now the objective is to identify the determinants of the middle-income trap in Iran, and to explore how the country can benefit from the experience of Malaysia, Thailand, South Korea, and China in escaping the trap. The main reasons for choosing these four countries for comparison are, first, they are developing countries (only South Korea is a developed country), second, they have been able to promote from the low middle-income to the high middle-income considering South Korea's promotion from the high-middle to the high income level. Third, countries like Malaysia has been dependent on the export of raw materials (such as tin), but they have been able to diversify exports and get out of the low middle income trap.

The implications of this study are to identify the determinants of per capita income growth of four successful East Asian countries, as well as avoiding the middle-income trap to taking stock for escaping Iran's economy from the middle-income trap.

The purpose of this study is to examine the determinants of middle-income trap in Iran, using the experience of Malaysia, Thailand, South Korea and China. The organization of the paper is as follows. After the introduction, the second section is devoted to the literature review. In the third section, we review the experience of four Asian countries in avoiding the middle- income trap, and then empirical studies are presented relatively. In the fourth section, the theoretical aspects of the model, model estimation, and analysis of the findings are provided. Finally, the article concludes with policy recommendations.

2. Literature Review

Actually, low-income countries can compete in the international markets by exporting labor-intensive products, and using imported technologies from abroad. These countries can then achieve productivity gains by shifting labor from low productivity agricultural sector to high productivity industrial sector or by shifting labor force to modern services.

However, when these countries reach the middle- income level, wages are beginning to

increase. As a result, competition is shrinking and, with the slow pace of growth, these countries are trapping in the middle- income level (Agenor and Canuto, 2015). Many developing countries, after achieving middle-income level, are trapped in that level which is characterized by the sluggish growth and productivity (Mirjalili, et al., 2018). The restructuring of the economy from low to high productivity activities, types of products exported, diversification of the economy, investment in education, R&D, and physical infrastructure are among the factors that affect the avoidance of the middle-income trap (Agenor, et al., 2014).

Felipe, et al. (2007) argued that services are major sources of total factor productivity growth in many Asian developing economies. For promoting to higher productivity production, countries need to consider the services sector in addition to the manufacturing sector. Of course, in some countries, an industrialization leap has happened (a very important step in the rapid growth of East Asian countries) and this has an impact on total factor productivity growth. For example, since the early 1990s, Latin America has substantially strengthened its governance and macroeconomic foundations, but so far, structural change in the region, if any, has not been yet translated into growth. The industrial employment has declined in favor of low productivity services and informal activities. In fact, realizing growth through the services sector has to come by continuous accumulation of human capital and the improvement of governance and institutions (MacMillan and Rodrik, 2011). In Ghana (a country with oil resources), the outcome of structural change over the period of 2000-2006 has been negative. While agricultural employment has been decreasing, the liberated labor force is mainly absorbed to low productivity services, which has a limited impact on total factor productivity (Osei and Jedwab, 2013).

The best way for a developing country to achieve sustained, dynamic growth is to follow comparative advantage in its industrial development and to tap into the potential of advantages of backwardness in industrial upgrading (Lin and Treichel, 2012).

The slowdown in the growth pace is mainly due to the slowdown in productivity. However, economic policies contributed to the increased productivity and innovation. The policies include sound macroeconomic policies, improved institutions, strengthening private sector development, infrastructure investment, and regional integration (Aiyar, et al., 2013), a larger share of high-tech exports and strong secondary and tertiary education systems (Eichengreen, et al., 2014). Moreover, investing in R&D, advanced infrastructure to accelerate innovation, while enforcing property rights, and removing labor market imperfections, have contributed to the increased productivity (Agenor and Canuto, 2015).

There are at least four essential elements for the long-term growth, which are particularly relevant to countries in transition to middle income level. When these elements are not available, the sluggish growth should not be surprising. These elements are as follows:

First, it is difficult to achieve a high growth rate without having a macroeconomic stabilization. Reasonable fiscal and monetary policies support long-term economic growth by helping countries to control inflation and prevent crises (Larson, et al., 2016).

Second, strong institutions and the rule of law are essential for the growth. The quality of governance- including public sector efficiency, corruption control, effective legal systems, contract enforcement and civil and political rights are all correlated to economic growth (Acemoglu, et al., 2005; Barro, 1996; Mauro, 1995; North, 1990).

Third, investment in education and human capital development is crucial for the growth. When the return on physical capital is declining, productivity improvement and technical innovation largely depend on human capital (Aghion and Howitt, 1998; Lucas, 1988).

Fourth, open and competitive markets support economic growth through enhancing specialization, efficient allocation of resources based on comparative advantage, productivity improvement and disseminating knowledge and technology (Dollar, 1992; Frankel and Romer, 1999). Countries which avoided the trap, benefited from total factor productivity growth, and had more inclusive levels of primary, secondary and tertiary education, and recorded more inventions. Higher education is

more important for these countries, so the quality of education is crucial for transiting to higher levels of income (Bulman, et al., 2014).

Kharas and Kohli, (2011) have argued that, in order to avoid the middle-income trap, countries need to focus on total factor productivity growth which requires enhanced quality of education. Enhanced secondary and tertiary educations are needed to equip the workforce with skills for innovation and developing new technology in the changing world (Dik Xon et al., 2013).

3. An Overview on Sampling Countries' Experiences in Avoiding the Middle Income Trap

Malaysia: Malaysia is a successful case for avoiding the middle-income trap and enhancing to the high-middle income level. Malaysia had a sluggish growth while being trapped in the middle- income level.

The real GDP per capita growth of Malaysia during the 1980s was above the average of 3.6%, which resulted in the doubling of income level over a period of 20 years. However, Malaysia's economic growth was lower than that of Singapore, Taiwan, and South Korea. These countries recorded real GDP growth rates of 4.4%, 5.7%, and 7.5% in the same period, respectively.

The productivity of Malaysian industry grew from $ 21,786 in 1980-1985 to $ 38,946 in 2000-2004. (Felipe et al., 2007). The evolution of Malaysian economy from the production of traditional goods to modern goods has helped Malaysia to promote from a low income country to a middle income country. At the global level, the trade in modern services has seen a higher growth, but Malaysian exports of modern services have stagnated. Of course, there were large areas for the investment and benefiting from globalization of services as enabling mechanisms to become a high-income economy (Flaaen, Ghani, & Mishra, 2013).

In the 1970s, Malaysia relied on exports of natural resources -primarily tin, rubber, and oil- but the Malaysian economy evolved to become the exporter of electronic components, natural gas and palm oil. In the late 1980s and 1990s, the production of more sophisticated products in Malaysia helped to achieve a high middle income level. Malaysia was quickly recovered from the global financial crisis and, based on the Global Competitiveness Index (GCI), achieved an innovation-based economy (Kasenda, 2015).

In short, Malaysia has been able to avoid the middle income trap by enhancing industrial productivity, transforming from traditional to modern goods production, investing in and exporting modern services as well as diversifying exports through innovation.

Thailand: Thailand a regional leader in high technology products, compared to other ASEAN countries, achieved high economic growth during the late 1980s and early 1990s. This achievement made possible promoting the high middle income level by 2011. Based on the global competitiveness index, Thailand is a productivity-development economy (Kasenda, 2015). Thailand's development model was based on the industrialization by using technology adapted from foreign direct investment, cheap labors and exports. This strategy helped increase per capita GDP and promoted Thailand to high middle income level. In Thailand, during the 1960s, in the first five-year development plan, the development strategy was the industrialization based on import substitution and government intervention. In the late 1970s, the strategy changed to the export-oriented industrialization to overcome the internal market constraints.

Real GDP per capita reached from $ 320 (before the first development plan) in 1960 to $ 685 in 1977 and more than double in 1987, when export orientation was promoted in the fourth development plan. Thailand's average growth rate was 8.2 percent in the 1980s and 1990s.

It took 26 years for Thailand to promote from the low middle to the high middle income level. Over the past decades, with an increase in the average years of education, from 5.3 years in 1986 to 8.3 years in 2009, the level of training for Thai workers has improved (Lathapipat, 2012). In 2011, more than 420 billion baht ($US 14 billion) of public funds were spent on education. Thailand's expenditure for education was about 4 percent of GDP, which was higher than the average for neighboring countries of East Asia and the Pacific (3.8 percent) and above Japan (3.8 percent) and Singapore (3.3 percent)

(Phongpaichit & Benyaapikul, 2013).

In short, Thailand has been able to avoid the middle-income trap by attracting foreign direct investment and a high technology and export-based industrialization, increasing public spending on training and enhancing human capital capability.

South Korea: South Korea's industrialization has been developed since 1962, by following Japan's industrial development.

In the textile industry, South Korea transited from garment exports to synthetic fiber production (Lim, 2011). In the electronics industry, the production began with radio assembly of imported components, then it moved towards electronic components (transistor and semiconductor) and ICT and industrial electronics respectively in the mid-1980s and 1990s (the World Bank, 1987). The clothing industry had a revealed comparative advantage in the late 1960s, followed by the footwear industry in the 1980s, and electronic industry in the 1990s.

Shoe industry competitiveness has benefited from joint ventures and technology cooperation between South Korean and Japanese companies. Since the late 1980s, South Korean labor-intensive industries have benefited from foreign investment to achieve an export-oriented industrial development. In fact, the pursuit of the export-oriented growth strategy began in the mid-1960s. The Korean government then moved on to create international competitive capabilities by encouraging domestic companies to compete in the global market. Thus, the industrial development shifted from labor-intensive to high-tech industries.

By 2010, the share of South Korea's exports increased to 52.6 percent of GDP. Three factors in the South Korea's outward-oriented strategy can be identified. First, it has an appropriate and coherent economic policy. Second, it uses an appropriate technology and the national innovation system. Third, it encourages large indigenous companies to compete in the global markets. South Korean government has driven industrial development from labor-intensive industries to heavy and chemical industries aiming to create a competitive economy. To this end, the South Korean government is identified with its five-year plan of 'big push' in the investment and export targets for the picked industries (Galbraith & Kim, 1998; Moreira, 1995). A high percentage of South Korea's innovative activities focused on electricity, electronics, computer and telecommunications, which were leading in the global markets (Mundy, 2013).

South Korea's industries have grown from low-tech to high-tech industries, while ASEAN's industries were not successful like Korea. In short, during the 1970s and 1980s, South Korea began to deploy high-tech industries that helped South Korea achieve low-middle income level in 1978. South Korea then reached the high-middle income level during a decade (1987). Subsequently, eight years later, South Korea achieved a high income level (1988-1995) (Chung, 2011).

In short, South Korea by diversifying its industrial production, creating a comparative advantage, and export-oriented industrialization could avoid the middle-income trap and achieve higher levels of income. This has happened through promoting foreign investment, encouraging domestic companies to compete in the global market, promoting high-tech industries, as well as increasing exports' share of GDP.

China: Among the measures of the central government of China was employing price mechanism and ownership motivation for farmers, which enabled them to sell a part of their products in the market. This improved the subsistence of many farmers and moved them towards the market economy. In addition, the government recognized that it is needed to open the economy in order to attract high technologies from abroad. As a result, China allocated four special economic zones along the coast to import high-tech products and export processing zones. China, like South Korea, did not have abundant natural resources, therefore promoted the export of manufactured products.

According to Perkins (2013), South Korea and China, both invested in training as a core competence. Since 1979, China has pursued a strategy of export promotion and diversification. China's reforms to achieve a high growth rate is realized through improving business environment and implementing corporate reforms, especially in the case of dividends for state-owned companies that has

led to a greater competitiveness. The adoption of innovative practices in trade and industrial policies has resulted in a labor migration from the low-productivity agricultural sector to the high-productivity industrial production. These practices have led to the accumulation of physical and human capital that facilitated the development of industrial products and services.

The reforms have led to increased productivity in the Chinese economy. As far as the innovation is concerned, the globalization of production and increased economies of scale, China's growth rate will be 10% for the rest of the decade and 8% and 7%, respectively, for the next two decades (Lin & Treichel, 2012).

In short, China has been able to avoid the middle-income trap by exporting its industrial products and diversifying exports, by initiatives in trade and industrial policies and high-productive production, as well as accumulating physical and human capital.

Cook (2014), in 'Will China be caught in the middle-income trap?', examined the feasibility of turning China into a consumer-oriented economy and compares China's economic development with South Korea and Malaysia, which have taken similar measures for the economic growth. The study examined the impact of the rule of law, education and population on the economic growth. Given the rapid China's economic growth based on the export promotion and investment, evidence suggests that China's economic growth is declining, despite the general belief that China is on the path to surpass the United States as the world's superior economy. Although china faced structural issues, including environmental and political challenges, the study argued that poor governance in the rule of law, education and demographic issues have the potential to trap China in the middle income level.

Farah (2016), in 'Evaluating Growth Slowdown: Does Middle-Income Trap Exist?', by using a panel data of 145 countries for 55 years, identified the existence of the middle income trap and its determinants. Research findings indicated that growth determinants in the middle income and high income levels were different, and middle income countries needed to change their growth strategy to achieve high income level.

Kasenda (2015) in 'Lessons for ASEAN Countries Stuck in A Middle-Income Trap from Korea's Economic Development and Institutions' analyzed the middle income trap in Indonesia, Thailand, Malaysia and the Philippines. The study findings suggested that good governance and institutions were essential to promote efficient markets and private sector development, leading to increased productivity, investment, and industrialization. In addition, it indicated that improving the infrastructure and education were the determinants in South Korea's avoidance of the middle income trap.

Lubis and Saputra (2015), in 'The Middle-Income Trap: Is There a Way Out for Asian Countries?', examined the middle income trap in China, India, Indonesia, Malaysia, the Philippines, and Thailand. The effects of some determinant variables for per capita income, such as government expenditures, investment costs, export of high technology products, human capital (enrollment rates in secondary and higher education), and dependency ratios were analyzed using the factor analysis and the regression methods. The findings indicated that the government spending, investment costs, export of high technology products and human capital had a positive impact on per capita income growth. But the dependency ratio had a negative impact on per capita income.

Doner and Schneider (2016) in 'The Middle-Income Trap: More Politics than Economics', argued that countries in the middle income trap faced with both institutional and policy challenges. Policies to enhance productivity such as human capital and innovation needed investment in the institutional capacity.

Cai (2012), examined the Relevance of Middle-Income Trap literature to China. The results indicated that China faced the challenge of going beyond the middle income level due to population structure changes, changing patterns of lags and resource growth. The proposed policies to avoid China from the middle income trap were improving total factor productivity, human capital development, and deepening reforms.

Jitsuchon (2012), in 'Thailand in a Middle-Income Trap', examined Thailand's challenges

in this regard. Poor quality of education, imperfection in skills training, the low level of R&D activities and imperfections in the tax administration were among the determinants of the middle income trap in Thailand. In order to get out of this issue, the Thai government should not intervene in the market, but it needs to direct the incentive system to develop research, developing infrastructure and tax benefits for enhancing R&D activities and innovation.

4. Theoretical Basis and the Model

To estimate the model, we first explore the determinants of four East Asian countries in Equation 1, in which how they tried to avoid the middle- income trap. Then in Equation 2, by inserting Iran, we examined the effect of the variables on Iran, which is done using a dummy variable.

The given panel data is a combination of cross-section and time series data, two models estimated using the variables observations for 24 years, 4 sections for Model 1 and 5 sections for Model 2.

According to the theoretical literature and the experiences of Malaysia, Thailand, South Korea and China, and considering the most common variables in explaining the middle income trap, the first model, which includes four countries other than Iran, is specified as follows:

$$LnGDP_{it} = \alpha_i + \theta_1 INV_{it} + \theta_2 HC_{it} + \theta_3 HTE_{it} + \theta_4 TFP_{it} + \theta_5 EX_{it} + \theta_6 SRV_{it} + u_{it} \quad (1)$$

i=1,…,4 t=1991,…,2014

The second model includes Iran. Using dummy variables, we compared the coefficients of Iran's variable and other 4 countries. The second model is specified as follows:

$$LnGDP_{it} = \alpha_1 + \alpha_2 D + \beta_1 X_{it} + \gamma_1 DX_{it} + u_{it} \quad (2)$$

i=1,…,5 t=1991,…,2014

Where X_{it} is a column matrix including explanatory variables for the five countries, and D is a column matrix of the dummy variable. β_1 is the linear matrix which contain estimated coefficients for all countries under study and γ_1 is also a linear matrix including estimated coefficients representing the difference in the coefficients of the variables for Iran and other countries.

ln GDP is the logarithm of GDP per capita in purchasing power parity (at constant prices in 1990), INV is the investment share of GDP, HC is the human capital index based on the years of schooling and returns to education, HTE is the share of high-technology exports in total manufactured exports (products with high R & D intensity such as aerospace industries, computers, pharmaceuticals, scientific tools and electrical machinery), TFP is the total factor productivity level at current purchasing power parity (also called multi-factor productivity). It is a part of the production that was not explained by the traditional calculations of labor and capital inputs utilized in production, as well as its growth rate which is calculated by differentiating growth rates of labor and capital inputs from the growth rate of production. EX is the share of the exports of goods and services in GDP, and SRV is the share of the value added of services in GDP. Also, D is a dummy variable which takes 1 for Iran and 0 for all other countries. For independent variables, the dummy variables are DINV, DHC, DHTE, DTFP, DEX, and DSRV to test the difference between the coefficients and the comparison of Iran with other four countries.

GDP data are extracted from the Madison database, INV, HTE, EX, and SRV are extracted from database of the World Development Indicators, HC from the Penn World Tables and TFP is extracted from the US Federal Reserve Database.

4.1. The Model Estimation

We estimate the model and make the necessary tests to obtain the variables coefficients of each model.

The numbers in parentheses are the test statistic and P-Value at the level I(1). The P-Value is significant at the level of 5%. * is a significant level of 10%.

Table 1. Unit Root test of Levin, Lin and Chu for the Variables in the First Model

Variable	Test Statistic	P-Value	Result I(0)	Result I(1)
Ln GDP $_t$	-2.3830	0.0086	Reject H_0	-
INV $_t$	-1.9810	0.0238	Reject H_0	-
HC $_t$	-2.9402	0.0016	Reject H_0	-
HTE $_t$	-1.1817 (-3.0387)	0.1187 (0.0012)	Not Rejecting H_0	Reject H_0
TFP $_t$	-0.9086 (-2.1748)	0.1818 (0.0148)	Not Rejecting H_0	Reject H_0
EX $_t$	-1.3732	0.0848*	Reject H_0	-
SRV $_t$	-2.2761	0.0114	Reject H_0	-

Source: Authors

Table 2. Unit Root test of Levin, Lin and Chu for the Variables in the Second Model

Variable	Test Statistic	P-Value	Result I(0)	Result I(1)
Ln GDP $_t$	-1.8763	0.0303	Reject H_0	-
INV $_t$	-2.7623	0.0029	Reject H_0	-
HC $_t$	-3.3961	0.0003	Reject H_0	-
HTE $_t$	-0.6992 (-2.7306)	0.2422 (0.0032)	Not Rejecting H_0	Reject H_0
TFP $_t$	-0.5797 (-2.1884)	0.2811 (0.0143)	Not Rejecting H_0	Reject H_0
EX $_t$	-1.7929	0.0365	Reject H_0	-
SRV $_t$	-2.6315	0.0042	Reject H_0	-

Source: Authors

The numbers in parentheses are the test statistic and P-Value at the level I(1). P-Value is significant in the level of 5 percent.

As the results of Tables 1 and 2 indicate, the dependent variable that is the logarithm of GDP per capita and independent variables including the investment, human capital index, exports of goods and services (in the first model at 10%) and the value added of the services at 5% level are significant and stationary. High technology export and total factor productivity are not significant and non-stationary, but after first-order differentiation, they become stationary. Initially, we need to examine co-integration between variables to avoid spurious regression.

Table 3. Kao Co-integration Test

Model	Test Method	Test Statistic	P-Value	Result
First Model	ADF	-1.9829	0.0237	Reject H_0
Second Model	ADF	-1.7635	0.0389	Reject H_0

Source: Authors

According to the results of Table 3, the co-integration or the existence of a long-term equilibrium relationship between explanatory variables and the dependent variable is accepted for both models at the 5% level. Therefore, it can be said that although the variables are stationary at the level I(1), they are co-integrated at the level, and the regressions are not spurious.

Table 4. Hausman Test, Heteroscedasticity of the Variance of Fixed Effects (Wald), and Wooldridge Autocorrelation Test

		Hausman Test		
Model	**Test Statistic**	**Degree of Freedom**	**P-Value**	**Result**
First Model	192.92	6	0.0000	Reject H_0
Second Model	227.74	12	0.0000	Reject H_0
		Wald Test		
Model	**Test Statistic**	**Degree of Freedom**	**P-Value**	**Result**
First Model	28.16	4	0.0000	Reject H_0
Second Model	2533.50	5	0.0000	Reject H_0
		Wooldridge Test		
Model	**Test Statistic**	**Degree of Freedom**	**P-Value**	**Result**
First Model	55.358	1 , 3	0.0050	Reject H_0
Second Model	54.383	1 , 4	0.0018	Reject H_0

Source: Authors

Therefore, based on the results of Table 4 and Hausman Test, the H_0 hypothesis is rejected for the first and second models, and

the estimation of these two models is accomplished by using the fixed effects method.

Based on the results of Wald Test, there is a variance heteroscedasticity of error terms for both models. Therefore, for both models, the method of fixed effects utilized and the heteroscedasticity is not rejected. Hence, for estimating both models, the generalized least squares method (xtgls) and the unrestricted model are used.

As the results of Wooldridge Test indicate, H_0 hypothesis, the lack of a first-order serial autocorrelation, is rejected for both models. Therefore, both models have first order serial auto-correlation which should be taken into account in the estimation of the models.

With regard to the tests performed for the models and the results obtained, because of variance heteroscedasticity and auto-correlation in the model, we estimated the models by FGLS (feasible GLS) to estimate the models and remedy the heteroscedasticity of variance and serial-correlation. The results are illustrated in Tables 5 and 6 for both models.

Table 5. The results of Fixed Effect Method with Variance Heteroscedasticity and Auto-correlation (the First Model)

Variable	Coefficient (P-Value)
C	5.08 (0.000)
INV $_{it}$	0.007 (0.000)
HC $_{it}$	0.75 (0.000)
HTE $_{it}$	0.005 (0.003)
TFP $_{it}$	0.86 (0.000)
EX $_{it}$	0.006 (0.000)
SRV $_{it}$	0.02 (0.000)
$\mathbf{R^2}$	0.95
χ^2 **Test Statistic**	871.18 (0.0000)
Number of observations (NT)	96

Source: Authors

The numbers in brackets are significant at 5% level.

Table 6. The results of Fixed Effect method with Variance Heteroscedasticity and Auto-correlation (the Second Model)

Variable	Coefficient (P-Value)	Coefficient (Iran)
C	4.99 (0.000)	8.40
D	3.41 (0.000)	-
INV $_{it}$	0.008 (0.000)	0.003
HC $_{it}$	0.72 (0.000)	0.37
HTE $_{it}$	0.005 (0.004)	0.005
TFP $_{it}$	0.83 (0.001)	0.83
EX $_{it}$	0.006 (0.000)	-0.003
SRV $_{it}$	0.02 (0.000)	0
DINV $_{it}$	-0.005 (0.037)	-
DHC $_{it}$	-0.35 (0.000)	-
DHTE $_{it}$	-0.004 (0.288)	-
DTFP $_{it}$	-0.33 (0.181)	-
DEX $_{it}$	-0.009 (0.001)	-
DSRV $_{it}$	-0.02 (0.000)	-
$\mathbf{R^2}$	0.94	0.99
χ^2 **Test Statistic**	1356.14 (0.0000)	-
Number of observations (NT)	120	24

Source: Authors

The numbers in brackets are significant at 5% level.

The results of Table 5 indicate that the share of investment in GDP has a positive and significant effect on GDP per capita growth and, with an increase of one percentage point, the GDP per capita growth will increase by 0.007%. The human capital index has a positive and significant effect on the GDP per capita growth, and by an increase of one percentage point, the GDP per capita growth will increase by 0.75%. High-tech exports also have a positive and significant effect on the GDP per capita growth, and by an increase of one percentage point, the GDP per capita growth will increase by 0.005%.

The total factor productivity has a positive and significant effect on the GDP per capita growth, and by an increase of one percentage point, the GDP per capita growth will increase by 0.86%. Export of goods and services also have a positive and significant effect on the GDP per capita growth, and with an increase of one percentage point, the GDP per capita growth will increase by 0.006 percent. Finally, the value added of the services sector has a positive and significant effect on the GDP per capita growth and, by an increase of one percentage point, the GDP per capita growth increases by 0.02%.

The results of Table 6 indicate that in Iran, the share of investment in GDP has a positive and significant effect on the GDP per capita growth. By an increase of one percentage point, the GDP per capita growth increases by 0.003%. The human capital index has a positive and significant effect on the GDP per capita growth, and by an increase of one percentage point, the GDP per capita growth

increases by 0.37%. High-tech export also has a positive and significant effect on the GDP per capita growth, and by an increase of one percentage point, the GDP per capita growth increases by 0.005%.

Total factor productivity has a positive and significant effect on the GDP per capita growth. By an increase of one percentage point, the GDP per capita growth increases by 0.83%. Export of goods and services has a negative and significant effect on the GDP per capita growth and, by an increase of one percentage point, the GDP per capita growth decreases by -0.33%. Finally, the value added of services has not a significant effect on the GDP per capita growth, and by an increase of one percentage point, the GDP per capita growth has not affected.

4.2. Findings Reconsidered

Public investment, especially investment in infrastructures may contribute to the GDP per capita growth and help avoiding the middle income trap. The human resource improvement may increase the productivity which in turn will boost economic growth and drive the country out of the middle income trap. When the production technology varies, the level of productivity varies, and this gives rise to the economic growth. Therefore, the export of high-tech products is effective in the GDP per capita growth and avoiding the middle income trap. The total factor productivity is one of the most important factors contributing to the GDP per capita growth, and other factors impact indirectly through their impact on the productivity. Therefore, improving the total factor productivity and promoting value added exports increase the economic growth and help escaping the middle income trap. Iran's exports are mostly based on petroleum and its products, and the volatility of oil exports can in the long run, reduce the GDP per capita growth. Services, especially modern services, may increase the total factor productivity and in turn the economic growth and avoiding the middle income trap, provided that the economy is able to promote human capital and accumulate the capabilities in order to generate high-productivity activities.

5. Conclusion and Policy Recommendations

Total factor productivity and human capital have the greatest impact on avoiding the middle income trap. Special attention should be paid to the export of high-tech and services in Iran. The services require skilled labor and more investment in the human capital. Industrial training needs to link with development targets.

Enhancing investment in the infrastructure may help avoiding the middle income trap in Iran. Improving access to the infrastructure will increase the productivity. By investing in the skills needed to work in the R & D activities, enhancing R & D capability, and upgrading innovation, Iran can produce high-quality products and export high-tech goods. With these measures, Iran can make its export basket more diverse and complex to mitigate the dependence on oil and escaping the middle income trap.

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