

Mahmoud A. Touny

Helwan University  
Egypt

## THE EFFECT OF ECONOMIC REFORM POLICIES ON HUMAN DEVELOPMENT: EVIDENCE FROM EGYPT

### Keywords

*Economic Reform;  
Financial Reform;  
Human Development;  
Budget Deficit;  
Exchange Rate  
Reform; Trade  
Liberalization.*

### Abstract

*Using the VAR model, this paper investigates the impact of the economic reform policies adopted by the Egyptian government since the beginning of 1990s on human development in Egypt. The results indicate that both inflation and budget deficit have a negative impact on HDI. In addition, the cumulative effects of the lags of monetary and exchange rate reforms have a negative impact on HDI. In turn, policies aiming at liberalizing international trade have a positive effect on human development. The results also indicate that unexpected shocks in inflation rate or money supply have a permanent effect on HDI in Egypt. Besides, the prediction of HDI in Egypt suggests a decreasing trend through the period (2015-2020). The study provides some policy recommendations to enhance human development in Egypt along with targeting the reform of macroeconomic imbalances and promoting the economic growth.*

### Introduction

Many developing countries suffering from structural macroeconomic imbalances have adopted economic reform programs which aim at stabilizing the national economy, supporting the economic growth, reducing the budget deficit, alleviating price subsidies of goods and services, and liberalizing markets and exchange rate. International funding organizations such as the International Monetary Fund (IMF) and the World Bank have indicated that economic reform and market liberalization programs will achieve growth, which works to improve the situation of the poor in the long run. However, practical experience in many countries that have adopted these reform programs have

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shown further deterioration in income distribution by increasing poverty and inequality, which link to the aggravation of domestic and external debt problem, the explosion of inflation and unemployment, and the collapse of the national currency.

Economic reform programs in some countries may have succeeded in raising their economic growth rates, but the measurement of economic growth does not take into account the human dimension of development. It is important to note that economic growth experienced within a country does not necessarily ensue human development. Thus, economic growth in itself is an imperfect measurement of development. Therefore, any analysis of a country's development level should not only include economic indicators, but also indicators that reflect human dimensions. On this account, evaluating the experiences of economic reform programs should also take into consideration their effects on social conditions such as the progress in health care services, education services, social programs, and reforms that affect the well-being of a population.

At the beginning of 1991, the Egyptian government signed an agreement with the IMF and the World Bank in order to achieve economic stability, reform structural imbalances and promote economic growth in the medium and long-term. Therefore, the current research tries to address to what extent policies pursued by the Egyptian government within the framework of the economic reform and structural adjustment program (ERSAP) affect the level of human development in Egypt. Have these policies contributed to improvements in human development and the rate of spending on health and education, and the quality of these services, or have they had negative impacts on human development indicators?

The main hypothesis of this research is that, in general, economic reform policies undertaken in Egypt within the ERSAP have a negative impact on Egypt's human development indicator (HDI). However, some of these policies may have positive impact on human development, whereas other policies may have negative impact. It is assumed that policies aimed at reducing the budget deficit, devaluating the exchange rate, and liberalizing the financial sector have a negative impact on human development in Egypt. Reducing budget deficit requires downsizing public expenditure, which could adversely affect the financial allocations for education and health, and could then negatively affect human development. On the other hand, it is expected that devaluating the exchange rate and liberalizing the financial sector will result in increasing the inflation rate and will therefore negatively affect

the level of human development. With regard to policies aimed at liberalizing the international trade, it is assumed that trade liberalization may have a positive impact on the level of human development. Free trade can support human development through its positive effect on economic growth. However, in a small vulnerable open economy, external shocks may threaten human development. Therefore, the net effect of trade liberalization on human development may be positive or negative. The study utilizes data available through the period (1991-2014) and employs the vector autoregressive (VAR) model to examine these hypotheses. Based on the results of the empirical analysis, some policy implications are provided.

The rest of the article is structured as follows. Section 2 includes the literature review. Section 3 provides an overview about the economic reform program and human development in Egypt. Section 4 describes data and methodology used in this paper. Section 5 addresses the discussion of the empirical analysis of the estimated model. Finally, section 6 draws conclusions and makes policy recommendations.

## **Literature Review**

Previous studies addressing the impact of economic reform on human development policies are varied. Some of these studies have dealt with the impact of economic reform policies as a whole on human development, some have studied the impact of some aspects of the economic reform, such as trade or financial liberalization on human development, while others have investigated the impact of economic reform policies on some dimensions of human development such as education, health and poverty.

Studies which have examined the impact of economic reform policies on human development are very limited. Orfao (1996) examined the effects of European economic integration in Portugal on its human development level. Access to EU has made it possible for Portugal to address fundamental structural reforms devised to enhance the performance of markets as resource-allocation mechanisms. The study indicates a high correlation between Portugal's participation in the regional integration process and an increase in the level of human development.

Jha (2008) analyzed human development indicators of the Indian economy since the economic reform program which started in July 1991. The study shows that although the economic growth in India accelerated and became more stable in

the post-reform period, poverty levels and regional dispersion of poverty in India increased due to these reforms. Flabbi *et al.* (2008) argued that economic reforms had weak evidence of increasing returns to education, except in Hungary and Russia where that rise was remarkable.

Another study by Satija (2009) investigated the relationship between economic reforms launched in the 1990s and social justice in India. The study indicates that although economic reforms realized their goals of stabilizing and restructuring of the Indian economy to be internationally competitive, these economic reform measures were at the expense of reducing government spending on sectors such as education, health, and human resources development.

Using panel data of transition countries through the period 1992-2007, Carvalho *et al.* (2013) examined the impact of market-oriented institutional and infrastructure reforms on the different dimensions of HDI. The results show that there are positive impacts of institutional economic reforms on some dimensions of human development.

Gangadharan and Yoonus (2012) examined the impact of the economic reform program in enhancing the quality of human life in India focusing on three main health indicators, viz. the infant mortality rate, child mortality rate and life expectancy at birth. The outcomes show that there is no significant impact of Indian reform program on the quality of human life.

Hoddie and Hartzell (2014) addressed the effects of the International Monetary Fund's structural adjustment programs (SAPs) adopted by some countries on their public health performance. The main finding is that SAPs have a negative impact on health indicators in the short run and in the long run, as well.

Using an endogenous growth model with public educational spending, Greiner (2016) theoretically examined the impact of fiscal policy on economic growth and human capital formation. The results indicate a negative relationship between the ratios of both debt to private capital and debt to GDP, and the long-run growth rate. Higher debt ratios require more resources for servicing public debt which is, in turn, at the expense of productive educational spending.

Regarding the impact of privatization as one of the pillars of economic reform policy in many countries on human development, literature suggests that large scale privatizations have led to negative impacts on some human development indicators. Ayres (1995) showed that privatization and deregulation increased the level of poverty in Brazil. In addition, Galiani *et al.*, (2005) examined how

privatization in the water sector could have an impact on child mortality, and their findings indicate that privatization is associated with significant reductions in the death rate and infectious diseases. Moreover, King *et al.* (2009) supported that mass privatization in ex-communist countries have led to an increase in the mortality rate. Furthermore, Carvalho *et al.* (2013) indicated that large scale privatization seems to have negative effects on health and economic indicators. However, Giang *et al.*, (2015) investigated the impact of firm privatization emerging in Vietnam in the early 1990s on the welfare and poverty of local people and clarified that firm privatization as well as the agglomeration of private firms is accompanied by a decrease in poverty of local households and an improvement in household welfare.

Some studies have examined the relationship between economic growth and human development. Ranis *et al.*, (2000) examined the two-way links between human development and economic growth at both theoretical and empirical levels. Using a dataset of some developing countries, their study showed a significant relationship in both directions and emphasized that a focus on human development must be included from the beginning of any reform program. Using a panel data model and a co-integration approach, Rabbani (2006) investigated the role of economic reform and human capital in economic growth of South and Southeast Asian countries and demonstrated that human capital affected growth positively. Tridico (2007) studied the relationship between human development and economic growth during transition period and concluded that investing in human development is a necessary but not a sufficient condition for economic growth. Furthermore, Rabbani and Maksymenko (2011) employed theoretical and empirical research on the role of economic reforms and human capital on the post-reform economic growth in India and South Korea during the second half of the twentieth century. Their results provide evidence that both economic reforms and improvements in human capital have positive impacts on a country's growth.

Other studies have dealt with the impact of economic reform policies on poverty levels. Using time series analysis of poverty indicators, Ninan (2000) analyzed the impact of the economic reforms initiated in India in 1991 on the poor and poverty reduction. The outcomes indicated that rural, urban and overall national poverty levels in India had witnessed a significant reduction during the pre-reform period, but these negative relationships during the post-reform period had weakened or even reversed in terms of one or more poverty indicators. Fane

(2006) studied the effect of trade liberalization as part of the economic reform and switching from a centrally planned economy to a market-oriented initiated in 1986 on poverty reduction in Lao PDR. He demonstrated that although the benefits of growth had gone disproportionately to the non-poor and inequality had increased, open trade policy had a positive impact on poverty as incidence of poverty had fallen. In addition, Siggel (2010) studied the effect of Indian economic reforms of the 1990s on poverty reduction. The outcomes showed that the HDI of the leading and lagging states converged and that convergence accelerated in the 1990s and thus confirmed a slow-down in poverty reduction in the post-reform period. Using data of 18 countries in Asia, Li and Yu (2014) investigated the effect of the financial reform on income inequality and human capital in Asia. Their results show that the financial reform is effective in reducing income inequality, and this effect is more powerful in a country with a higher human capital.

## **An overview of economic reform policies and human development in Egypt**

### **The economic reform program initiated in 1991**

The Egyptian economy experienced during the 1980s, especially in the second half, structural imbalances reflected in a lower economic growth rate and increased deficit in each of the balance of payments and public budget, which amounted to about 20% of GDP. Between 1980/81 and 1990/91, Egypt's external debt increased from \$22.1 billion to \$31.1 billion. Likewise, the average annual budget deficit amounted to 18% of GDP. Moreover, the rate of inflation had accelerated and reached more than 20% and open unemployment had risen to about 10% by 1990 (African Development Bank Group, 2000). In addition, the expansion during the eighties in the use of fiscal policy helped to maintain a high rate of domestic demand, which in turn created further pressure on prices and the balance of payments. Moreover, the use of restrictive imports policy had worked to create a high degree of protection of the domestic product and then were overshadowed by international competition resulting in the production of goods with low quality which were unable to price competition in foreign markets, or even to compete locally in the case of open domestic markets to foreign products. Also during this period, the Egyptian economy had witnessed a multiple and overvaluation of exchange rate, which in turn encouraged inefficient investment and left other pressures on the balance of payments (Kheir-Eldin and El-Dersh, 1992).

As a result of all these imbalances, the Egyptian government signed an agreement with the IMF and the World Bank at the beginning of 1991 in order to alleviate the structural imbalances, which is known as the Economic Reform and Structural Adjustment Program (ERSAP). The first goal of ERSAP was stabilization of the economy in order to reduce inflation and realize macroeconomic stability. The second goal was the structural adjustment which aimed to enhance medium and long term growth. Modification of social policies was the third goal of the program in order to minimize transitory effects of economic reform on the poor. The program of stabilization and structural adjustment has included four major policies; financial and monetary reform, liberalization of foreign trade, stimulation of domestic and foreign investment, and public sector reform and the start of the privatization program. The stabilization component aimed to stabilize internal and external accounts, and to unify the exchange rate. The economic reform component aimed to liberalize markets and reform public enterprises.

Financial reform included reducing the budget deficit. To achieve this goal, the government adopted reforming tax policy to be more transparent, and rationalizing government spending. Also, the government changed the method of financing the budget deficit from monetary expansion to non-inflationary finance measures such as Treasury bill auctions. Financial reform also included the rationalization of government spending in the public sector companies by controlling the total spending of these companies. As a result, budget deficit witnessed a significant reduction through the beginning of 1990s, thus decreasing from 17.2 as a percent of GDP in 1990 to about 1% in 1997. Also, inflation rates decreased substantially from 19.7% in 1991 to only 3% in 1999 and in 2001, inflation rate reached its lowest level at 2% (Salsecci *et al.*, 2015; Sharaf, 2015).

At the level of external debt, the Egyptian economy had been achieving a remarkable reduction in the external debt service through an agreement with the Paris Club to reduce and reschedule its debt. In May 1991, seventeen creditor nations approved to exempt Egypt from 50% of the debt, provided it persisted in the implementation of the structural reform program. Therefore, Egypt was granted a debt relief package of around \$20 billion, which contributed to reducing the debt service through the period 1992 - 1997 (Sharaf, 2015; Korayem, 1997).

Financial reform during the 1990s coincided with parallel reforms in monetary policy and the banking sector. The primary focus in the reform of the monetary policy was in the use of indirect instruments to manage liquidity and strengthen the

bank balances of the local currency through interest rate liberalization and the policy of the credit ceilings. At the beginning of 1991, the government resorted to removing nominal ceilings on commercial interest rates and allowing banks to set their deposit and lending prices guided by interest rates on public Treasury bills. The liberalization of interest rates with low inflation rates through the 1990s had significantly led to the existence of positive real interest rates on domestic deposits (Korayem, 1997).

In the area of trade reform, the government had taken a series of measures to liberalize foreign trade, include the changes in the exchange rate system, and reconsider the use of tariff and non-tariff barriers, as well as the signing of a set of regional or bilateral trade agreements aimed at achieving greater access to foreign markets. The Egyptian government had made remarkable progress in reducing tariff and non-tariff barriers during the 1990s to liberalize foreign trade according to the program of structural reform and in accordance with the requirements of the WTO. Egypt had a series of bilateral and regional agreements, which in turn contributed to the Egyptian foreign trade liberalization. These agreements included the European Union, the United States, and some Arab and African countries.

The starting point in reforming the exchange rate regime was by replacing the multiple exchange rate system with a dual exchange rate for a temporary period in February 1991. In October 1991, the exchange rate was unified, and non-banks were allowed to operate in the foreign exchange market. In 2003, Egypt adopted the managed floating exchange rate regime instead of the fixed exchange rate regime in order to achieve price stability and reduce inflationary pressures by curing the overvaluation of the Egyptian pound and dealing with the growing black market for currency (Sharaf, 2015).

Egypt has adopted the privatization of public sector companies since the beginning of the 1990s under the framework of the ERSAP in order to raise the real growth rate and increase the contribution of the private sector to production and development. The Privatization program has primarily focused on selling companies under Law 203 of 1991 in order to improve competitiveness, to reduce the burden of supporting these companies by the government, to stimulate the environment for private investment, and to provide growth and employment opportunities. During the period from 1993/1994 until 2004, 135 companies were totally sold and 64 companies were partially sold out of the total 314 companies which were put up for sale (IBM Business Consulting Services, 2004).

Although the Egyptian government had carried out economic reforms seriously through the 1990s, this picture about the performance of macroeconomic indicators changed dramatically in the 2000s. Changes in Egypt's nominal exchange rate were very limited and experienced a slow depreciation during 2003-2011, which in fact reflected a crawling peg regime. Inflation rates increased significantly during this period reaching 18% in 2008 despite the policy reforms undertaken. Budget deficit gradually increased to reach about 7.7% in 2010. Public debt as a percent of GDP increased to reach about 104.7% in 2005, and the external debt amounted to \$33.75 billion in 2005, representing about 33.5% of GNI. Although the economic growth rate had witnessed a relatively high record during this period reaching 7.15 in 2008, the poverty levels and income inequality increased during this period (See Table 1).

The Egyptian January 25 revolution has carried a challenging transition phase faced with low foreign direct investment, a high budget deficit, a high debt rate, a high inflation rate and a high unemployment rate. Revenue from tourism has collapsed, putting pressure on the balance of payments, which in turn has sparked a slide in foreign reserves. The Egyptian foreign exchange reserves have been dropping rapidly from \$36 billion pre-revolution to \$15 billion post-revolution. External debt increased by 6.9%, while its share in GDP has declined because GDP growth exceeded the growth of debt over the same period. Real GDP growth decreased sharply from 5.1% in fiscal year 2009/10 to 1.8% in 2010/11 due to the slowdown of economic activity, the manufacturers' inability to receive raw materials, and the temporary closing of banks and stock-market. Political instability has led to economic unrest and made foreign investors worried about

**Table 1**  
**Macroeconomic Indicators of the Egyptian Economy (selected years)**

| Indicator              | 1990  | 1997  | 2000  | 2005  | 2008  | 2010  | 2011  | 2014  |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| GDP growth             | 5.7   | 5.49  | 5.37  | 4.47  | 7.15  | 5.14  | 1.82  | 2.2   |
| Inflation rate         | 16.8  | 4.6   | 2.7   | 4.9   | 18.3  | 11.3  | 10.1  | 10.1  |
| Budget deficit*        | 17.2  | 1     | 5.2   | 6.45  | 6.36  | 7.73  | 10.08 | 12.8  |
| External debit**       | 78.44 | 37.69 | 28.96 | 33.49 | 20.27 | 16.78 | 15.32 | 14.19 |
| Public debit*          | -     | -     | 72.2  | 104.7 | 85.9  | 83.4  | 88    | -     |
| Official exchange rate | 1.55  | 3.39  | 3.47  | 5.78  | 5.43  | 5.62  | 5.93  | 7.08  |
| Unemployment           | 9.6   | 8.2   | 9.4   | 10.6  | 9.4   | 12    | 12.7  | 13.4  |

\* Budget deficit and public debit as a percent of GDP

\*\* External Debit as a percent of Gross National Income (GNI)

Source: [www.theglobaleconomy.com](http://www.theglobaleconomy.com) < <http://www.theglobaleconomy.com> > (5/5/2016)

investing in Egypt, causing some of them to leave the country. As a result, unemployment rates have increased since the fiscal year 2010/11, reaching 13.4% in 2014 (Abdou and Zaazou, 2013; Saif, 2011).

### **Human Development Indicators in Egypt**

The World Bank figures on poverty in Egypt during the period 1990 - 2010 clearly indicate a general decline in the income poverty and human poverty nationwide and a correlation between poverty rates and economic growth. But a different reading more deeply of the same figures show that the overall composition of poverty and unemployment in Egypt has not changed significantly during the period 1990-2010, and that the improvement apparent in urban poverty has not taken into account the true representation of the slum areas in income and expenses surveys of the family which formed the basis for calculating poverty. In both cases, the figures indicate an Egyptian development experience during the past two decades which was characterized by the expansion of relative deprivation and a sense of deprivation among broad segments of society, especially with the development pattern of consumption of upper classes. More seriously, this stage is characterized by the expansion of marginalization and vulnerability through focused jobs in the informal sector and deprived of adequate income and any kind of social protection. The result is a general feeling of insecurity and the lack of hope for the future, and the loss of hope for education. Because of the low level of income and increased poverty in Egypt, this has resulted in a large portion of direct government spending to support necessary goods, where fuel subsidies alone constitute about 75% of the total government spending on all social services, including education and health (Dardari, 2011).

Table 2 reviews Egypt's progress in each of the HDI indicators. It is clear that the overall HDI between 1990 and 2014 has increased from 0.546 to 0.690, an increase of 26.4 % or an average annual increase of about 3 %. Over the last ten years, Egypt has advanced ten places in the overall ranking (from 119 to 110). Life expectancy at birth increased by 6.5 years between 1990 and 2014, mean years of schooling increased by 3.1 years, and the expected years of schooling increased by 3.5 years. Egypt's GNI per capita increased by about 79.1% between 1990 and 2014 with an average annual increase of about 7.9%.

Compared with other southern Mediterranean countries, Egypt has a relatively low level of human development. In 2014, the index was equal to 0.68 in Egypt indicating medium human development. This record was just above that of Syria and Morocco in southern Mediterranean and is equal to the average for

**Table 2**  
**Egypt's Human Development Indicators (selected years)**

| Year | Life expectancy<br>at birth | Expected years<br>of schooling | Mean years of<br>schooling | GNI per capita<br>(2011 PPP\$) | HDI value |
|------|-----------------------------|--------------------------------|----------------------------|--------------------------------|-----------|
| 1990 | 64.6                        | 9.7                            | 3.5                        | 5,870                          | 0.546     |
| 1995 | 66.8                        | 10.8                           | 4.1                        | 6,568                          | 0.583     |
| 2000 | 68.6                        | 11.9                           | 4.8                        | 7,878                          | 0.622     |
| 2005 | 69.4                        | 12.3                           | 5.6                        | 8,531                          | 0.646     |
| 2010 | 70.4                        | 13.0                           | 6.6                        | 10,409                         | 0.681     |
| 2011 | 70.5                        | 13.1                           | 6.6                        | 10,356                         | 0.682     |
| 2012 | 70.7                        | 13.5                           | 6.6                        | 10,419                         | 0.688     |
| 2013 | 70.9                        | 13.5                           | 6.6                        | 10,439                         | 0.689     |
| 2014 | 71.1                        | 13.5                           | 6.6                        | 10,512                         | 0.690     |

Source: United Nations Development Programme (2015): Briefing Note for Countries on the Human Development Report 2015: Egypt. (United Nations Development Programme, 2015)

Arab countries' aggregate. With regard to education indicators, Egypt recorded poor performance considering both the mean years of schooling and the score for higher education and training. Moreover, the record of life expectancy in Egypt is the lowest in the region after Morocco. Per-capita income calculated at the PPP in Egypt is higher than that of Morocco only. Poverty headcount ratio at national poverty lines (% of population) in Egypt is much higher than that in Morocco, Tunisia and Turkey. As seen in Table 3, this ratio was about 25.2% in Egypt in 2010 compared to 15.5% in Tunisia, 14.4% in Jordan and 3.7% in Turkey in the same year and 14% in Morocco in 2008. According to the Central Agency for Public Mobilization and Statistics (CAPMAS) in Egypt, 26.3% of the Egyptian population lived below the national poverty line and 4.4% of the population lived in extreme poverty in 2013 (Salsecci *et al.*, 2015). The Global Competitiveness Report (2015/2016) indicated that the score of the quality of primary education and the quality of the education system in Egypt is 2.1 with a rank 139 of 140, and the score of the extent of staff training in higher education is 2.7 with a rank 139 of 140. These figures reveal the relatively low human development indicators in Egypt compared with similar countries at the same level of development, which calls upon us to identify to what extent economic reform policies adopted by the Egyptian government since the beginning of the 1990s have affected Egypt's human development.

## Data and Methodology

This paper examines the impacts of economic reform policies on the HDI in Egypt through the period 1991-2014 when the major economic reforms were implemented. The study utilizes HDI data available from the Human Development Reports published by the United Nations Development Programme (UNDP) as an independent variable. The HDI is a measure of achievements in three basic dimensions of human development: healthy life, access to knowledge, and the standard of living. Healthy life is measured by life expectancy, knowledge level by mean years of education among the adult population, and the standard of living by GNI per capita.

The dependent variables include some instrumental variables reflecting economic reform policies undertaken in Egypt through the study period. These variables are:

- Trade openness (TO): This variable is an indicator of liberalization of foreign trade. TO is measured as exports plus imports as a percent of GDP, which is available from the World Bank.

**Table 3**  
**Human Development Indicators of some Southern Mediterranean Countries in 2013**

| Country | HDI  | Mean years of schooling | Education training | Life expectancy (years) | Population (millions) | Population in poverty (%) | Health expenditure %GDP |
|---------|------|-------------------------|--------------------|-------------------------|-----------------------|---------------------------|-------------------------|
| Algeria | 0.72 | 7.6                     | 3.69               | 71                      | 38.7                  | N.A.                      | 6.0                     |
| Egypt   | 0.68 | 6.4                     | 3.27               | 71.2                    | 86.7                  | 25.2 (2010)               | 4.9                     |
| Israel  | 0.89 | 12.5                    | 5                  | 81.8                    | 8.2                   | N.A.                      | 7.4                     |
| Jordan  | 0.75 | 9.9                     | 4.78               | 73.9                    | 6.7                   | 14.4 (2010)               | 8.0                     |
| Libya   | 0.78 | 7.5                     | 3.59               | 75.3                    | 6.2                   | N.A.                      | 4.3                     |
| Morocco | 0.62 | 4.4                     | 3.56               | 70.9                    | 33.2                  | 14 (2008)                 | 6.1                     |
| Syria   | 0.66 | 6.6                     | N.A.               | 74.6                    | 21.4                  | 35.2 (2007)               | 3.3                     |
| Tunisia | 0.72 | 6.5                     | 4.28               | 75.9                    | 11                    | 15.5 (2010)               | 7.0                     |
| Turkey  | 0.76 | 7.6                     | 4.69               | 75.3                    | 76.9                  | 3.7 (2010)                | 5.4                     |

Source: HDI, Mean years of schooling, Life expectancy: United Nations Development Programme.

Education training: World Economic Forum.

Population, Population in poverty, Health Expenditure %GDP: World Development Indicators, World Bank.

- **Budget Deficit (BD):** Budget deficit is an indicator of financial reform policy as financial reform targets reducing the budget deficit. Budget deficit is measured by government budget balance as a percent of GDP available from the World Bank.
- **Exchange rate (ER):** Exchange rate is another indicator of trade reform and monetary policy as trade reform targets liberalizing foreign trade including the changes in the exchange rate system. Exchange rate is measured by official exchange rate (local currency units per U.S. dollar) available from the IMF.
- **Broad money as a percent of GDP (M2GDP):** Broad money is an indicator of monetary policy and financial sector reform, which measures the level of financial development of the economy. It is assumed that broad money will move upward with the reform in the financial sector. This data is available from World Development Indicators, the World Bank.

**Table 4**  
**Correlation Matrix of Independent Variables**

|       | INF   | ED      | TO    | BD     | ER      | IR    | M2GDP |
|-------|-------|---------|-------|--------|---------|-------|-------|
| INF   | 1.00  |         |       |        |         |       |       |
| ED    | 0.44* | 1.00    |       |        |         |       |       |
| TO    | 0.47* | 0.29    | 1.00  |        |         |       |       |
| BD    | 0.18  | -0.28   | -0.13 | 1.00   |         |       |       |
| ER    | -0.09 | -0.76** | 0.06  | 0.36   | 1.00    |       |       |
| IR    | 0.12  | 0.88**  | -0.11 | -0.40* | -0.82** | 1.00  |       |
| M2GDP | 0.15  | 0.21    | 0.49* | -0.12  | 0.15    | -0.06 | 1.00  |

\* indicates significant at 5%, \*\* indicates significant at 1%.

**Table 5**  
**Results of Augmented Dickey-Fuller (ADF) unit root test.**

| Variables | Level              |                 | 1 <sup>st</sup> Difference |                 |
|-----------|--------------------|-----------------|----------------------------|-----------------|
|           | Without time trend | With time trend | Without time trend         | With time trend |
| HDI       | -1.34              | -1.39           | -6.09**                    | -6.88**         |
| INF       | -2.59              | -2.43           | -6.78**                    | -7.06**         |
| TO        | -1.24              | -1.23           | -3.87**                    | -3.75*          |
| BD        | -2.87              | -3.47*          | -8.50**                    | -8.02**         |
| ER        | -1.38              | -2.52           | -4.78**                    | -4.64**         |
| M2GDP     | -1.03              | -1.02           | -3.56*                     | -3.08*          |

Note: \* indicates rejection of null hypothesis of non-stationary at 5%,

\*\* indicates rejection of null hypothesis of non-stationary at 1%.

- Inflation rate (INF): Inflation rate reflects the stabilization of the economy due to economic reform policies. Inflation is measured by a percent change in the Consumer Price Index available from World Development Indicators, the World Bank.

Other variables such as external debt (ED) and interest rate (IR) are excluded from the model due to the high correlation between them and the exchange rate. The matrix of correlation between the independent variables is listed in table 4.

To test the stationarity of each series, Dickey-Fuller stationarity test is conducted. Table 5 clarifies that all variables are non-stationary in level but stationary at first difference, which means that the variables are integrated of order one I(1).

According to asymptotic distribution theory developed by Phillips and Durlauf (1986), Stock (1987) and Sims *et al.* (1990), OLS yields consistent parameter estimates for non-stationary variables when they are co-integrated. Therefore, the vector autoregressive (VAR) model with non-stationary data is appropriate for this type of data (Fanchon and Wendel, 1992). Furthermore, when the series are non-stationary but integrated of the same order, then the Vector Error Correction Model (VECM) can be used<sup>(1)</sup>.

The VAR model is one of the most flexible and easy to use models for the analysis of multivariate time series. The VAR model has proven to be especially useful for describing the dynamic behavior of economic and financial time series and for forecasting. The model depends on using lags of the original variables as instruments to reduce simultaneity bias that can arise when estimating the OLS model. The model structure is that each variable is a linear function of past lags of itself and past lags of the other variables.

The lag order selection for the VAR model is determined by the Likelihood Ratio test (LR) which indicates that the optimal lag length of the study model is two. In the VAR model of order 2, denoted as VAR(2), the lag 2 values for all variables are added to the right side of the equation. Therefore, the estimated VAR model takes this form:

$$HDI_t = \beta_0 + \beta_1 HDI_{t-1} + \beta_2 HDI_{t-2} + \beta_3 INF_{t-1} + \beta_4 INF_{t-2} + \beta_5 TO_{t-1} + \beta_6 TO_{t-2} \\ + \beta_7 BD_{t-1} + \beta_8 BD_{t-2} + \beta_9 ER_{t-1} + \beta_{10} ER_{t-2} + \beta_{11} M2GDP_{t-1} + \beta_{12} M2GDP_{t-2} + u_t$$

- (1) The Johansen co-integration model was estimated first, but the co-integrating rank of the estimated model (trace statistics) was 4 which implies that there were four error correction terms in the co-integrating relationships and all error correction terms were insignificant. Therefore, the study depends on estimating the basic VAR model.

## Results and Discussion

Table 6 displays the results of the estimated VAR model which reflect the short run causality between dependent and independent variables. The coefficients of the lags of the dependent variable (HDI) are positive and significant at 5 and 1 percent level of significance, respectively. This result suggests the presence of a persistence effect. The large coefficient of the lags indicates that a high level of HDI in the past stimulates the current level of human development.

With regard to the effect of inflation on human development, the results indicate that the first lag of inflation has a negative and significant impact on HDI. Increasing in inflation rates puts pressure on the government to reduce the finance allocated to human development activities on education and health in order to limit the growth of budget deficit and direct the priority to support the necessary goods and needs of food and energy. This result is confirmed by the sign of the second lag of budget deficit which is negative and significant. This indicates that increasing the budget deficit is at the expense of resources directed to human development activities. On the other hand, trade openness seems to have a positive impact on human development. The positive relationship between free trade and economic growth is confirmed in numerous studies which, in turn, is reflected in positive impact on human development. Liberal trade policy leads to trade expansion which, in turn, generates economic growth, thus having a positive impact on human development. Also, Liberalization of trade in services as one of the results of the multilateral negotiations under the WTO and as one of the pillars of the economic reform program in Egypt has led to increasing the role of local and foreign private sector in the provision of educational services from private schools and universities as well as private hospitals, which, in turn, has contributed to raising the HDI.

Monetary and exchange rate reforms have a mixed impact on HDI. The first lag of the exchange rate variable has a positive and significant impact on HDI, whereas the second lag has a negative impact, but the cumulative effect of both lags is negative. Also, the effect of the first lag of M2GDP is negative, whereas the second lag has a positive impact on HDI, but the cumulative effect of both lags is negative. Economic reform policies in Egypt during the study period imply liberalizing the exchange rate regime which has resulted in an increase of the official exchange rate (devaluation of the Egyptian currency), thus contributing to an increasing trend of inflation, especially since the beginning of 2000s, and negatively impacting HDI. Also, increasing the broad money as a percent of GDP

**Table 6**  
**Results of Estimated VAR Model**

| Variable         | Coef.   | Z                        | P. Value |
|------------------|---------|--------------------------|----------|
| L1.HDI           | 0.3239  | 2.28                     | 0.022    |
| L2.HDI           | 0.6613  | 4.50                     | 0.000    |
| L1.INF           | -0.0008 | -2.45                    | 0.014    |
| L2.INF           | -0.0002 | -0.60                    | 0.546    |
| L1.TO            | 0.0009  | 3.36                     | 0.001    |
| L2.TO            | -0.0003 | -1.54                    | 0.124    |
| L1.BD            | 0.0001  | 0.23                     | 0.820    |
| L2.BD            | -0.0011 | -2.55                    | 0.011    |
| L1.ER            | 0.0085  | 2.32                     | 0.020    |
| L2.ER            | -0.0097 | -2.80                    | 0.005    |
| L1.M2GDP         | -0.0013 | -3.74                    | 0.000    |
| L2.M2GDP         | 0.0009  | 2.68                     | 0.007    |
| Constant         | 0.0291  | 0.91                     | 0.361    |
| Log likelihood   | -34.369 |                          |          |
| Chi <sup>2</sup> | 596.42  |                          | 0.000    |
| R <sup>2</sup>   | 0.996   |                          |          |
| Jarque-Bera test |         | 1.44 (Chi <sup>2</sup> ) | 0.485    |

during the study period has led to increasing inflationary pressures in the Egyptian economy and has increased the budget deficit, which, in turn, negatively affects the resources directed to human development activities.

In order to use the estimated model for prediction, some diagnostic tests are conducted first to confirm the goodness of fit of the estimated VAR model. Lagrange-multiplier test is conducted to check if the VAR model has a serial correlation or not. The null hypothesis of this test is that there is no serial correlation. The results of the test as reported in Table 7 indicate that there is no serial correlation as both lags are insignificant. Also, Jarque-Bera test is done to investigate if residuals of the model are normally distributed or not. The Chi-square value of the test is 1.44, which is insignificant (see table 6). Therefore, the null hypothesis that the residuals are normally distributed is accepted.

Next, the dynamic stability of the estimated VAR model is examined. Table 8 clarifies that all the moduli of the eigenvalues are less than one, which implies that the estimated VAR model satisfies the stability condition.

Granger causality test is conducted in order to jointly test the causality between the lags of independent variables and HDI. As indicated in table 9, there is strong

**Table 7**  
**The Lagrange-Multiplier Test**

| <b>Lag</b> | <b>Chi<sup>2</sup></b> | <b>Df</b> | <b>Prob.</b> |
|------------|------------------------|-----------|--------------|
| 1          | 20.19                  | 25        | 0.737        |
| 2          | 29.30                  | 25        | 0.252        |

**Table 8**  
**Eigenvalue Stability Condition**

| <b>Eigenvalue</b> | <b>Modulus</b> |
|-------------------|----------------|
| 0.9415            | 0.9503         |
| 0.9415            | 0.9503         |
| 0.8419            | 0.9401         |
| 0.9419            | 0.9401         |
| -0.8735           | 0.8735         |
| -0.1036           | 0.6042         |
| -0.1036           | 0.6042         |
| 0.4065            | 0.5256         |
| 0.4065            | 0.5256         |
| -0.3616           | 0.5002         |
| -0.3616           | 0.5002         |
| -0.4158           | 0.4158         |

evidence that all lagged independent variables Granger-cause HDI. This Implies that the lagged independent variables help predict the level of human development in Egypt.

Granger-causality may not tell us the complete story about the interactions between the variables. In order to identify the responsiveness of the dependent variable in the VAR model when a shock is put in the error term, a unit shock is applied to each variable in the model to see its effect on the dependent variable using the impulse response function. In this case, it is assumed that there is an

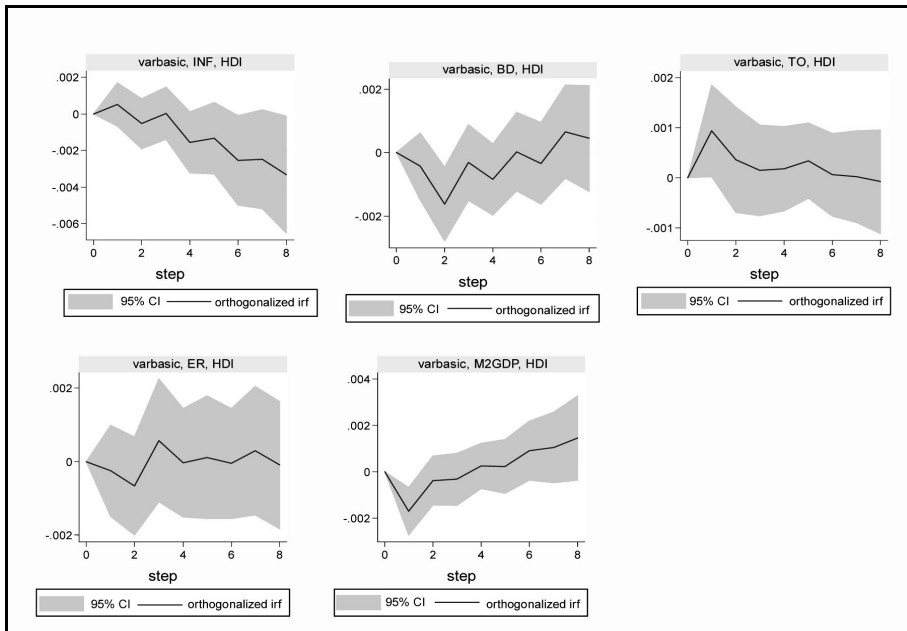
**Table 9**  
**Granger Causality Test**

| <b>Null Hypothesis</b>           | <b>chi2</b> | <b>Prob.</b> |
|----------------------------------|-------------|--------------|
| INF does not Granger Cause HDI   | 6.11        | 0.047        |
| TO does not Granger Cause HDI    | 11.57       | 0.003        |
| BD does not Granger Cause HDI    | 8.99        | 0.011        |
| ER does not Granger Cause HDI    | 7.89        | 0.019        |
| M2GDP does not Granger Cause HDI | 13.99       | 0.001        |

exogenous change (shock) in one variable as see the effect of this change of another variable. If there is a reaction of one variable to an impulse in another variable we may call the latter causal for the former. Because the variables used in the model are  $I(1)$ , this implies that the effect of some shocks will not die out over time and thus may have a permanent effect.

Figure (1) indicates that an orthogonalized shock to the inflation rate and broad money supply has a permanent effect on the HDI in Egypt, whereas an orthogonalized shock to the budget deficit, trade openness and exchange rate seems to have a transitory effect on HDI as the effect of a shock dies out over time. According to this model, unexpected shocks in inflation rate or money supply will have a permanent effect on HDI in Egypt, but unexpected shocks that are related to budget deficit, trade openness and exchange rate will have only a transitory effect on the level of human development in Egypt.

After checking the validity of the estimated model, the VAR model can be used to forecast the future trend of the HDI for the next 5 years. As shown in Figure 2, there is a decreasing trend of the HDI in Egypt through the period (2015- 2020).



**Figure 1: The Impulse Response Functions**

## Conclusion and policy recommendations

This research provides an empirical study of the impact of the economic reform policies adopted by the Egyptian Government since the beginning of the 1990s on the level of human development in Egypt. The study covers the period (1991-2014) and utilizes the VAR model to examine the relationships between the variables. The results of the empirical analysis indicate that both inflation and budget deficit have a negative impact on HDI. Increase in inflation rates puts pressure on the government to reduce the finance allocated to human development activities on education and health in order to limit the growth of the budget deficit and direct the priority to support the necessary goods and needs of food and energy. Trade liberalization on the other hand has a positive effect on human development. Free trade results in trade expansion which, in turn, generates economic growth and thus have a positive impact on human development. Also, liberalizing trade in services leads to increasing the role of local and foreign private sector in the provision of educational services from private schools and universities as well as private hospitals, which, in turn, contribute to raising the level of human development. The cumulative effects of monetary and exchange rate reforms have a negative impact on HDI. Devaluation of the Egyptian currency leads to

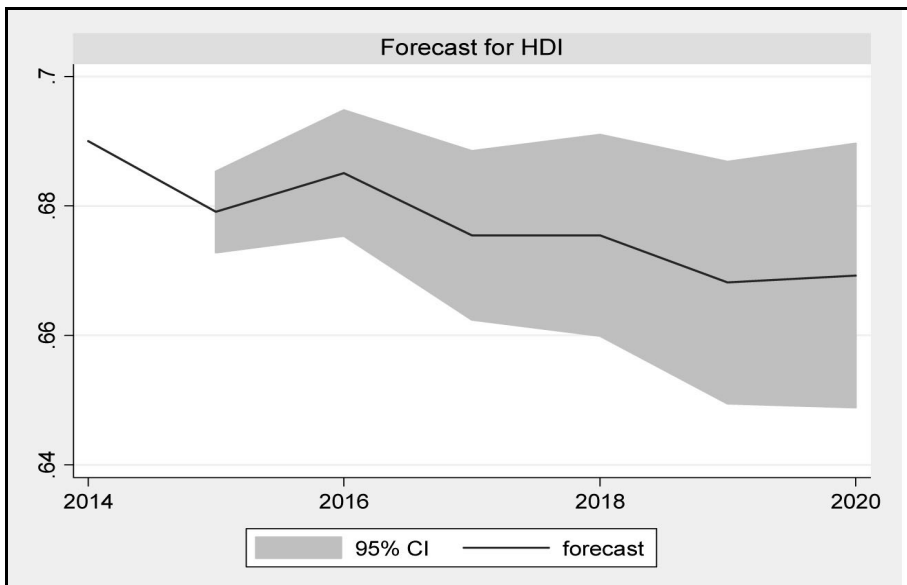


Figure 2: Forecasting the Trend of HGI through the Period (2015-2020)

high inflation rates which negatively affect HDI. Also, increase in money supply leads to increasing inflationary pressures in the Egyptian economy and therefore affects negatively the resources diverted to human development activities. The results also indicate that unexpected shocks in inflation rate or money supply will have a permanent effect on HDI in Egypt. Moreover, the prediction of HDI in Egypt suggests a decreasing trend through the period (2015- 2020).

The results of this study imply some policy recommendations. It is recommended that the Egyptian government should devote more effort to ensuring that inflation levels are kept low. In addition, reducing the budget deficit should not be at the expense of financial resources allocated to education and health sectors, although it could be achieved by enhancing government revenues, reducing the aspects of luxury public expenditure, and fighting corruption that wastes a lot of economic resources and increase the budget deficit. The Egyptian government must realize that human development is an essential component of sustainable economic development and should not only focus its attention on achieving economic growth without taking into account the dimensions of human development.

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**Mahmoud A. Touny** is an Associate Professor of Economics, Dpartment of Economics and Foreign Trade, Faculty of Commerce and Business Administration, Helwan University, Egypt. He got his Ph.D. degree of Economic from School of Economics, University of East Anglia (UEA), Norwich, UK in 2004. His research interests concentrate in Monetary and Financial Economics, Economic Policies and Foreign Trade. (tony\_mah@yahoo.com)