EFFECTIVENESS OF PUBLIC POLICIES DESIGN AND THE ROAD TO SUSTAINABLE GROWTH IN TUNISIA

Trabelsi Ramzi
High Business School of Tunis (ESCT), Manouba University, Tunisia
ramziramzi68@yahoo.fr

Abstract

The main purpose in this paper is to examine the impact of different public policies on the economic growth in Tunisia between 1990 and 2014. We estimated our basic model by using the ARDL bounds test technique. The econometric analysis gave various images and very interesting results .Our main findings indicate that Tunisian's disappointed economic growth results from bad designed and misguided public policies. This finding provides key insights on policy recommendations for policymakers.

Keywords: Economic Growth; Public policy; ARDL

JEL Classification: O40; E62; C22

1. Introduction

 Many nations grow and prosper while others regress and face economic problems. In fact, this is has nothing to do with miracles, luck or divine intervention. Many countries are the richest in terms of natural resources are classified among the poorest. Others with fewer resources have successfully generated wealth and high level of economic and technological growth based on a combination of locally designed policies.

 During the last economic development plans, Tunisia tried to achieve a higher economic performance, dreaming to catch up the pool of emerging countries. However, the government policies failed to solve many economic and social problems associated to the high unemployment rates especially among the young graduates, the low attractiveness of investment, the deficit trade balance, the inefficient financial and fiscal regulation, the policies related to innovation , education , institutional and governance aren't well designed.

After the revolution, the economic situation was more deteriorated. There wasn't a clear government plans to reduce the economic crises worsened by the social demands for economic justice. The revolution in Tunisia was based on the concerns of young people about their right of employment, democracy, social inequality and a political change totally in rupture with the past. The selfishness of politicians has worsened the country's economic situation. They forgot the real reason on which the revolution was born. After the Arabic revolution, Tunisia had suffered from a deep decline in economic development especially after the last terrorism acts. The situation was more complicated with the social unbalanced situation, the instability of political regime and the lack for a clear road map for achieving a better economic growth. Due to these facts, many steps have to be taken forward by government to set up a new vision and strategies. Many radical reforms have to be executed indeed to fix the economic decline and the social issues. On the reality grounds, the educational system in Tunisia is no longer performing since its quality has deteriorated for many years, giving a poor human capital in lag with technological changes and inappropriate to the needs of companies recruitments. According to the annual report of Lagos (2014-2015), the educational system is at the bottom of the international ranking, as it is classified in the 68th place among 144 countries. By referring to the government and central bank reports of Mars 2014, the GDP growth was 2.6% in 2013; the government has revised this rate in 2014 which would be only 2.8% against 3.5% previously due to slow down in the industrial activity.

Moreover, the National Statistics Institute (NSI) shows that the external balance of trade for January 2015 is in deficit when the exports decreased by 0.2% at constant prices. Also, the rate of Tax revenues recorded a low increase of 8.3% per year since 2010 accompanied with a remarkable inflation close to 6%. Beside these facts, the non-tax revenues excluding privatization, like the gain of public enterprises and oil fees, knew a sharp decrease. The budget deficit and the public debt increased from 3% of GDP in 2010 to 6.1% in 2013 and from 40% to 45% in 2013.

According to the latest statistics released by the Foreign Investment Promotion Agency (FIPA), foreign investments in Tunisia fell to 24.6% over the first 5 months of 2014, compared to the same period of 2013. The FDI could be an important factor to heal the unemployment high rate of youth and to renew the technologies used in production process. The internal resources are not enough to ensure sufficient growth for present

and future generation. The government must modify the existent policies to strengthen the attractiveness to FDI flows.

This is the 4th consecutive year of growth decline, a first in the Tunisian economic history has never experienced such a long period of low growth. According to the IMF report (2014), the slowdown in GDP growth is worsening the unemployment rate reaching 15, 3%. It has also slowing the government revenues while public spending continues to rise. The investment, both private and public, results in a rate Investment of only 20% of GDP. There are not sufficient means for providing the necessary equipment and production tools. This will weaken the productive capacity of the country and block the recruitment and employment. The World Bank and the rest of international institutions had called on Tunisia to improve its political reforms to get out of the crises. The government must take actions to save its economy that remains in a weak performance, where companies have stagnated in terms of productivity and job creation.

Recently, the Tunisian minister of economy and finance had shown a positive signal about making the necessary reforms to solve the problem of unemployment and low growth rates. The main brief for Tunisian authority should lead to the establishment of a new economic model. To do that, the government must change its policies in many fields of decision. The reforms have to ensure political and security balance, to ameliorate the quality of educational system, to create a new vision in financial and fiscal sectors, to enhance the industrial competiveness and innovation abilities, to promote investments and trade in the same time with others policies related to governance, competition, employment and environment.

The commune consensus is to know the limits and difficulties of the current growth model. The urgent character of the national economic situation involves preparing solutions for economic recovery in the short and medium term in order to build solid foundations for long-term economic development, hoping to reach the constellation of emerging countries. The government has to act rapidly to modify some policies which can enhance economic growth in short term. Some of these policies can represent a weakness or an obstacle. Our analysis tends to examine the impact of various economic policies on economic growth in Tunisia. The study adopts the political economy approach to explain which policies which fail to contribute to Tunisian economic development. So, are these policies good or bad for economic growth in Tunisia?

This paper is organized as follow: section 1 reviews the theoretical and empirical literature on the effect of economic policies on economic growth. Section 2 discusses our empirical methodology, data and contains the main results. Section 3 will be dedicated to the conclusion.

2. Literature Review

Many theoretical and empirical Literatures had shown that every public policy is a core factor that causes economic growth. The link between these policies and economic growth has been widely studied:

2.1. Promoting the Financial Policy

Gurley and Shaw (1955) identified a significant relationship between financial intermediaries and growth. According to Patrick (1966), the demand-following mean

that the creation of modern financial institutions, their assets and financial services come from the need of investors and savers. In this case, the financial system is able to support the leading sectors in the process of economic growth. The evolution of the financial system is a consequence of real economic growth. Then, the supply of financial services provided by the creation of financial institutions and markets, lead to a causal relationship running from financial development to economic growth. The supply-leading financial development provides a real capital formation in the early stages of economic development. The theory of endogenous economic growth started with Romer (1990), Lucas (1988) and Barro (1991) had a significant contribution about financial policy and growth. The first views represented by Schumpeter (1911); Gurley and Shaw, (1955); Goldsmith, (1969); McKinnon, (1973); Shaw, (1973); Roubini and Sala-i Martin, (1992) suggest that government policies should focus on improving financial system, because financial development cause growth. In other hand, others like Lucas, (1988); Stern, (1989); Stiglitz, (1994) induce that the policies induced by government to promote financial system have a weak impact on growth, as causality run from growth to financial development. The first significant study of comparison between countries was done by Goldsmith (1969). He adopted the cross-section analysis and time series in same time. His sample covered 35 countries, 19 developed and 16 less developed. His findings suggested a positive correlation between financial development, as measured by the size of financial intermediaries relative to GDP, interpreted as an indicator of quality of financial services provided, and economic growth. Levine et al. (2000) and Beck et al. (2000) use a panel technique to support the existence of a causal relationship from financial development to economic growth. Using a panel of 77 countries for the 1960–1995 periods, they find that higher levels of banking sector development produce faster rates of economic growth and total factor productivity (TFP) growth.

2.2. Fiscal policy through taxation instrument

The fiscal policy has an important role in government policy as an economic growth determinant. Based on the Keynesian theory, it state that government can influence macroeconomic productivity levels by increasing or decreasing tax levels and public spending. Fiscal policy must be oriented toward full employment, as its impact directly private income and agents' expectations concerning the future. For that reason Keynes proposed the use of public expenditures or investment rather than increasing consumption, due to its stronger multiplier effect. Many frameworks attempted to explain how government policy can effect economic growth. Barro (1990) argued that the effect of an increase in government investment financed by incomes taxes is ambiguous, the tax policy depends on the orientations of policymakers and its impact isn't the same for economic actors.

Alesina and Ardagna (2009) examined the effect of large change in fiscal policy in OCDE countries between 1970 and 2007. By using simple regression, they found that fiscal stimuli based on tax cut increase growth more than government spending increases. Those based upon spending cuts and no tax increases are more likely to reduce deficits and debt over GDP ratios than those based upon tax increases.

2.3.Education policy and human capital

The public policies in the world focus on promoting the quality of the educational system, since education is a premium source of productive and efficient labor force. In fact, the quantitative aspects of human capital were enough revealed, but less attention has been accorded to study the qualitative aspects of education.

The establishment of an effective education policy is necessary to form a human capital able to assimilate the foreign technology and to innovate. Lucas (1988) believes that human capital is the real engine of economic growth. He stressed the crucial role of human capital and training in the production of knowledge. Nelson and Phelps (1966) analyzed the relationship between education and growth through innovation. They concluded that the level of education boosts economic growth because it allows workers to acquire new knowledge. They argued that catching up countries would decrease their distance towards the technological frontier at a rate depending on the quality of human capital. In the same vein, Aghion (2006) showed that the growth effect of skilled labor is stronger when a country gets closer to the technological frontier.

Romer (2000) illustrated the complementarity between higher education policy and innovation policy; he assumed that the supply of researchers is constant and that the equipment used in the research sector are complementary to the highly skilled workforce; he showed that the increase in R&D subsidy in this case has no effect on investment in R&D. Aghion and Cohen (2004) showed the importance of education in economic growth. The endogenous growth theory suggests that the differences in growth between countries are due to differences in the effectiveness of R&D policies and the education system. For example, in countries close to the international technological frontier, education increases the supply of researchers and engineers; this increases the effect of any policy to encourage R&D on the degree of innovation. In the least developed countries, education facilitates the adaptability of the new technology and improves productivity.

2.4. Importance of the Innovation policy

Innovation policy can't be successful without robust policies that ameliorate the quality of institutions, stimulate the industrial competiveness and encourage university-industry collaboration in R&D. If IPR give an image about the quality of institutions, so innovation policies can't be efficient without upgrading the IPR policy. Innovation and intellectual property rights as a two complementary policies provide a clear picture about the degree of economic efficiency of a country. A country that gives more importance to R&D and protect well the rights of it inventors, is classified among the nations that register high rates of annual economic growth. So, developing countries must upgrade institution quality, industrial competitiveness and university-industry collaboration in R&D.

Most of endogenous economic growth models had shown a positive relation between innovation activities and economic growth .Beginning with Schumpeter (1931) who is the first economist who had studied the importance of innovation in promoting economic activity. He stressed the importance of patent protection for the entrepreneur who is the only one who is able to innovate, for protecting his profits coming through his invention, the inventor have to enforce the protection of his patent against imitation. He believes

that companies should be able to keep their production processes a top secret; their brands must be protected from any form of counterfeiting. The protection provided by the patent provides to firms stability in terms of innovation performances and profits until the launch of a new innovative activity and achieve the cost compensation. Arrow (1962) was a pioneer in the treatment of the relationship between the economy of intellectual property rights and innovation. The protection of property rights in all it various forms, play a crucial role in innovation systems. IPRs act as an incentive for innovation, since knowledge has the characteristics of a public good. In other vein, Endogenous theory, initiated by Romer (1986) and others economists like jones (1995), Aghion, Howitt (1995), Helpman and Grossman (1991), considers that innovation is a key factor to sustain economic growth. Innovation is generated by a stock of human capital devoted to research sector and it increase with the productivity of R&D. Romer (1990,1993) said that economic growth arises from a specific activity called the R&D and then he argued that protection by patent is an incentive to do more R&D and stimulate knowledge transfer. Countries should adopt attractive economic policies to invest in R&D and innovation, such as the protection of the invention through the establishment of an effective protection of the intellectual property system.

Rosenberg (1982), Jaffe (1986), Lichtenberg (1992) and Coe & Helpman (1993) claimed that the R&D efforts as measured by the number of innovations produced, have a significant and positive effect on economic growth, which don't depends on the country and the R&D sector sizes. Mansfield (1993) concluded that countries adequately protect intellectual property by patents, receive more foreign direct investment and thus more economic growth.

2.5. Benefits of the trade policy

Promoting international trade is at the core of public concern in most countries because it plays a big role in economic development. To ameliorate the economic performance, developing countries would increase its trade openness, lower the tariff level, and reduce the importation costs, specialized in exportation of value-added products and importation of high technologies. These factors will benefits the economic growth of developed countries.

Thirwall (1994) Romer (1993), Grossman and Helpman (1991) and Barro and Sala-i-Martin (1995) among others, argued that "openness can be good for growth. The opened economies grow faster than closed economies". In new growth theory, trade policy affect long-run growth by activating the technology transfer between the North and the South. Romer (1991), Grossman and Helpman (1991, 1992) affirmed that the commercial opening provides access to a global knowledge stock. This free access to larger markets promotes the exploitation of increasing returns to scale and avoid excessive activities in the sectors of R&D by devoting a larger share of human capital in R&D. Thus, Grossman and Helpman (1992) stressed that economic growth of developing countries will remain in progress if there are a strong   protection of North products against imitation.

2.6. Improving the doing business climate

FDI is very important source of funding and employment for developing countries especially in crises time. The countries set up more attractive policies to bring the

foreigner capital on their territory; it raises economic growth by generating technology diffusion and creating new jobs opportunities. FDI can play an important role in modernizing the national economy and promoting growth through technology diffusion [Grossman and Helpman (1991, 1995), Barro and Sala-i-Martin (1995, 1997)]. Empirically, Alfaro, Chandra, Kalemli-Ozcan, and Sayek (2000) used a cross-country data between 1975 and 1995. They showed that FDI alone plays an ambiguous role in contributing to economic growth. They noted that only countries with well-developed financial markets can gain significantly from FDI.

2.7. Targeting inflation and ensuring macroeconomic stability

Many industrial economies, such as OECD countries, had used income policies as a tool to control inflation high pressure. The Literature had focused on the inflation issue through many studies that based on Phillips curve and traditional wage-price models like Lipsey and Parking (1970). Fisher (1993) had highlighted the different indicators that describe the macroeconomic stability such as the inflation rate, the budget surplus or deficit, and the black market exchange premium. To guaranty a macroeconomic stability, the inflation rates have to be low, stable and easily predictable. If macroeconomic stability shows that the government is able to manage smoothly the economy in long and short run. But, if there are a high inflation rates, the government had failed to prevent macroeconomic instability and lost totally control. According to Dornbusch and Fischer (1993), the aim of government is to maintain its inflation rate in a low level to prevent economic growth decline. Many economies in which inflation remains at moderate levels for long periods, economic agents in a high or medium inflation economy have to expect many attacks on inflation at any moment. Fisher (1993) argued that macroeconomic policies can matter to growth due to the uncertainly. It affects the efficiency of price mechanism because it's associated with high inflation or instability of the budget so it reduces also the productivity. The temporary uncertainly about the macroeconomic stability lead to a low rate of investment because the investors don't like risks in uncertain situation. When uncertainly is high, the investment are low. Empirically, Fisher (1991) extended the analysis of Levine and Renelt (1992) based on forty cross-sectional growth studies published between 1980 and 1990. He included macroeconomic indicators in their basic equation. The main results showed that the per-capita growth is negatively associated with inflation and positively associated with the budget surplus as a share of GNP.

2.8. Reducing the external debt effects

The foreign debt is still an important subject in the economic policy studies until nowadays. In the theoretical literature, foreign debt can damage the economic growth if it is in a high level, but in moderate level it enhances growth and welfare. According to Panizza (2008), the developed countries rely too much on external debt to cover the lack of domestic capital and to ameliorate economic growth. The accumulations of external debts obstruct the economic development in the long run due to the difficulties to improve stronger fiscal reforms. In this situation, the government will be under pressure and must repay foreign creditors. The need of incentives to improve ne reforms are needed by developed countries to reduce the financial gap and to maintain their growth rate. Barro (1979) argued that in the presence of heavy fiscal charge, the government must use an optimal policy by borrows from abroad to reduce the fiscal charge.

3.   Empirical analysis

3.1. Variables and data sources

Basing on economic growth theory, we can construct our basic model to study the Tunisian case. We will use the set of proxies presented in the next table. All data are collected from different sources such as World Bank, IMF and Sherbrook university data bases.

Table 1: The variables used as proxies to public policies*Author's compilation

Policy	Proxy
Financial policy	Domestic credit provided by financial sector (% of GDP)
Fiscal policy	Government Expense (% of GDP)
Macroeconomic policy	Inflation, GDP deflator (annual %)
Employment policy	Unemployment with tertiary education (% of total unemployment)
Trade policy	Trade Terms (2000=100)
Attractiveness policy	Foreign direct investment, net inflows (BoP, current US$)

*Author's compilation

3.2.Model and estimation procedure

In this paper, we investigate the short-and long-run effect of public policies on economic growth. We attempt to contribute to the existed empirical literature by studying the Tunisian case and estimating a time series model by putting in consideration the existence of the structural breaks. The selection of variables relies on the theory background but we allow using other proxies. The model is represented in the form of a cobb-Douglas function inspired from Stanley Fischer (1993) cross-section study of the role of macroeconomic factors in growth. We will use a set of growth repressors as policy variables which doesn't differ a lot from the previous studies but in a time series regression case.

(Y) denote the economic growth (LGDP), (K) is the physical capital reflected by the foreign investment (LINV), (G) describes the government expenses (LBD). X denote some additional variables usually used in regression growth models called (X).

$$Y = f(k_t + G_t + + X_t + \epsilon_t) \tag{1}$$

(X) is a vector of variables containing: the inflation (LINF), the Trade Terms (LTR), the unemployment with tertiary education (LEMP) and the private domestic credits (LFIN). is the error term. The econometric specification of the model will be;

$$LGDP_t = \alpha_0 + \alpha_1 LTR_t + \alpha_2 LINF_t + \alpha_3 LINV_t + \alpha_4 LFIN_t + \alpha_5 LEMP_t + \alpha_6 LBD_t + \varepsilon_t \tag{2}$$

To estimate this model, we will use the ARDL bound test methodology elaborated by Pesaran et.al. (2001) to analyses the short- and long-run association between variables. The ARDL bound test can be used just when we have not any series that could be integrated in second difference I (2). To do so, we will refer to ADF unit roots test. We will make sure by adding the PP unit roots test because our sample is small. In fact, the ADF and PP tests are doubtful in the presence of outliers in series. To deal with this case, we will just use the procedure developed by Zivot and Andrews (1992) for a time series allowing for one structural break and Clemente et al (1998) unit roots test for two structural breaks[xi]. Then, we will formulate an unrestricted error-correction model (UECM) as a particular type of ARDL model. We will determine the pertinent lags for our models and test if our model passes the diagnostic tests. We will perform the bound test to see if there is a long- and short-run co-integration using Wald test. To test for co-integration in model (3), we will set the following conditional Unrestricted Error Correction Model (UECM);

$$
\begin{aligned}
\Delta LGDP_t = \alpha_0 &+ \sum_i \alpha_{i} \Delta LGDP_{t-i} + \sum \alpha_t \Delta LTR_{t-\tau} + \sum \alpha_s \Delta LINF_{t-s} \\
&+ \sum \alpha_k \Delta LINV_{t-k} + \sum \alpha_n \Delta LFIN_{t-n} + \sum \alpha_m \Delta LEMP_{t-m} \\
&+ \sum_\gamma \alpha_{\gamma} \Delta LBD_{t-\gamma} + \theta_1 LGDP_{t-1} + \theta_2 LINF_{t-1} + \theta_3 LINV_{t-1} \\
&+ \theta_4 LFIN_{t-1} + \theta_5 LEMP_{t-1} + \theta_6 LBD_{t-1} + \varepsilon_t
\end{aligned}
$$

$$\tag{3}$$

4. Result Analysis

4.1. Stationary test

To study the stationary of our series, the graph and the correlogram are the best way to explore our series stabilities. The well-known properties of a stationary series are the absence of serial correlation means that the ACF must be small or converge quickly to zero. The most of series are not stationary beside LEMP, LINV and LBD. For LEMP and LINV series, the graph indicates the presence of a Trend that makes the series not stable. Q-stat is important and the ACF dies out slowly to zero. The p-value is less than 5% indicating that the variable is significant and the null hypothesis of non-stationarity

is accepted. The LBD series shows a suspicious case, it is non-stationary in the graph, but in the correlogram it indicates that it is stationary. To make sure of our analysis, we will use the augmented Dickey-Fuller test (ADF). But, due to the small size of the sample, our results will be confirmed by the Phillips-Perron (PP) unit root test, because it's more efficient in this case. Moreover, the graph shows the existence of some structure break points. The traditional unit root tests don't allow for the possibility of a structure break and they are biased towards the non-rejection of the null hypothesis. In other words, for the series that are found to be I(1), there may be a possibility that they are in fact stationary around the structural break(s), I(0), but are erroneously classified as I(1). The results derived from ADF and PP tests are doubtful in the presence of outliers in series. To deal with this case, we will just use the procedure developed by Zivot and Andrews (1992) for a time series allowing for one structural break in time series.

4.2. Conventional unit root test

We summarize the results of traditional unit root tests in the following table:

		ADF test		PP test		Decision
		t-stat	t-critical	t-stat	t-critical	
LGDP						
	Trend + constant	-5,13	-3,61	-5,23	-3,61	Stationary
	Constant	- 5,22	- 2,99	-5,32	-2,99	I(0)
	None	- 0,61	-1,95	-0,28	-1,6	
LINF						
	Trend + constant	-0,64	-3,61	-0,64	-3,61	Non-Stationary
	Constant	-0,13	-2,99	-0,13	-2,99	I(1)
	None	-0,36	-1,6	-0,44	-1,95	
LTR						
	Trend + constant	-0,88	-3,61	-0,88	-3,61	Non-stationary
	Constant	-0,25	-2,99	-0,25	-2,99	I(1)
	None	-1,094	-1,95	-1,094	-1,95	
LFIN						
	Trend + constant	-1,62	-3,63	-1,24	-3,61	Non-stationary
	Constant	-1,40	-3	-0,97	-2,99	I(1)
	None	-1,01	-1,95	-1,04	-1,95	
LINV						
	Trend+ constant	-4,70	-3,63	-5,05	-3,61	Stationary
	Constant	-4,24	-2,99	-4,32	-2,99	I(0)
	None	-1,05	-1,95	-1,41	-1,95	

LEMP

●	**Trend + constant**	-3,51	-3,62	-2,96	-3,61	stationary
●	**Constant**	-0,72	-2,99	-2,68	-2,99	I(0)
●	**None**	-3,3	-1,95	-5,41	-1,95	

LBD

●	**Trend+ constant**	2,69	3,64	3,2	3,61	stationary
●	**Constant**	3,24	2,99	3,26	2,99	I(0)
●	**None**	0,57	1,95	0,65	1,95	

Table 3: Unit root tests without accounting for a structural break

*t-stat and t-critical value (5%) compared in absolute values. Tests have been performed using E-Views 8.

4.3. Zivot and Andrews (1992) unit root test results

According to the Zivot and Andrews test (ZA), the unit root hypothesis cannot be rejected at 5% significance level. The results show also that the 4 series has unit root with a structural break in the trend.

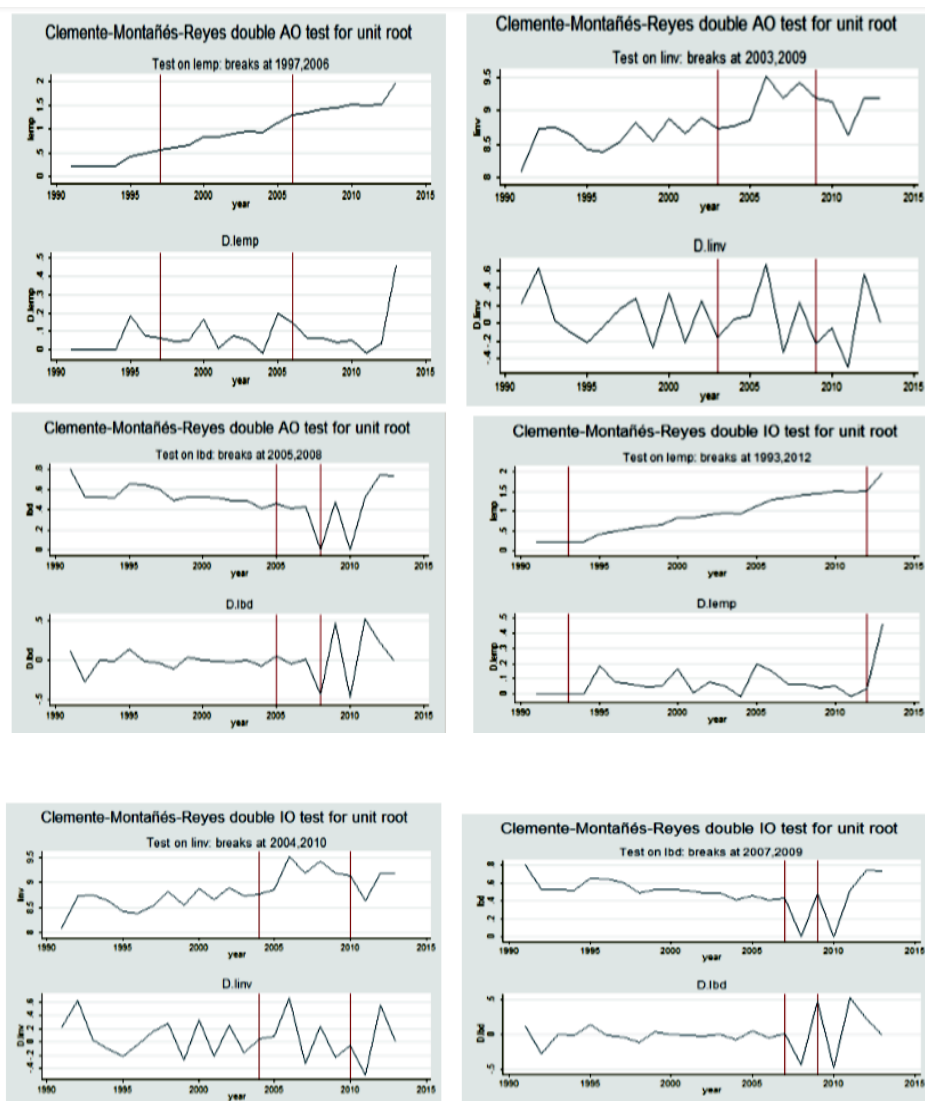**Table 4:** ZA unit root with one structural break results

	t-stat	Model TB	K	Decision
LGDP	-5,06	B	4	Stationary I(0)
LIN F	-3,32	B	4	Non-stationary I(1)
LTR	-3,36	B	4	Non-stationary I(1)
LFIN	-4,40 2010	B	4	Non-Stationary I(1)

*TB is the break date, K is the lag length, t-stat and t-critical value are in absolute values, t-critical value = -4,42 at 5% level for B model, t-critical value = -5,08 at 5% level for C model. , t-critical value = -4,93 at 5% level for A model. A- Intercept, B-Trend and C- Both. The lag length is chosen by SIC. Tests have been performed using E-Views 8.

Note that if ZA (1992) showed a clear evidence of a structural break, the ADF (1979) and P-Perron (1988) tests can't be considered. Based on graphs in the Appendix,

We will focus on LEMP, LINV and LBD series which can involve more than one structural break. To capture these outliers, we will use the Clemente and al (1998) unit root tests for two structural breaks. The CMR (1998) technique allows for two types of structural breaks in the mean of the series and verifies the null hypothesis of unit root with structural break(s) against the alternative of stationarity with break(s). These tests are able to analysis two kinds of outliers; additive outliers or the AO model, which captures a sudden change in a series. An innovational outliers called also the IO model, that allow for a gradual shift in the mean of the series.

Graph1 : Unit root tests

The table below gives the main results:

Table 5: Clemente et al (1998) unit root test with two structural breaks results

Variables	Additive outliers (CLEMAO2)		Innovative outliers (CLEMIO2)		Decision
	Min t-stat	Optimal BT	Min t-stat	Optimal BT	
- LEP	-2,7	1997,2006	-1,789	1993,2012	I(1)
- LINV	-5,39	2003,2009	-5,195	2004,2010	I(1)
- LDB	-2,815	2005,2008	-0,676	2007,2009	I(1)

Note: Min t-stat is the minimum t-stat calculated. Critical value for two breaks is −5.49 at 5%. BT is the break point. Tests have been performed using Stata 12.

From the table, we can notice that all series have two breaks. For LEMP and LDB and LINV series, we can't reject the null hypothesis of unit root in either AO or IO models. There are unit roots with two structural breaks in these series. Applying the unit root tests to the first-differences for LEMP and LDB and LINV, leads to a very clear rejection of the null hypothesis that the data are I (1). Finally, we will adopt the results of ZA (1992) and Clemente et al (1998) unit root tests with structural break(s).The mixture of integrations orders and the absence of I(2) in our results, we will lead us to use the autoregressive distributed lags (ARDL) model or Bound-test.

4.4. Diagnostic tests

In the most of time series models, the problems of the serial correlation, the heteroscedasticity, the model stability and the normality of distribution and the miss-specification of the model must be solved to get reliable results. In the table A7 below, our results showed that we succeed to pass these diagnostics, giving that our model is well developed.

Table 6: Diagnostic test results

Diagnostic	Tests	Results		
Normality Test	Jarque Bera	JB Stat: 1,54		(0,46)
Specification Test	Ramsey RESET	F-Stat:	32,6	(0,122)
Serial Correlation Test	B-G LM Test	Chi-sq:	0,067	(0,285)
Heteroscedasticity	ARCH LM	F-stat:	0,058	(0,81)
		P-Chi-sq:		(0,79)

For normality test, the p-value is greater than the critical value 5%, so it is non-significant; we fail to reject the null hypothesis saying that the residuals are normally distributed. The F-stat related to Ramsey Reset is not significant at 5%, so we preserve our null hypothesis and our model is correctly specified. The B-G LM test showed that the p-value exceed 5% so it is not significant, we cannot reject also the null hypothesis of absence of serial correlation. The ARCH LM test gives a p-value greater than 5%, so we succeed to pass the heteroscedasticity problem. Finally, we conclude that our model is stable since the plots of CUSUM, CUSUM of squares and Recursive Coefficients didn't cross the critical value line. All the results are proved by the next graphics:
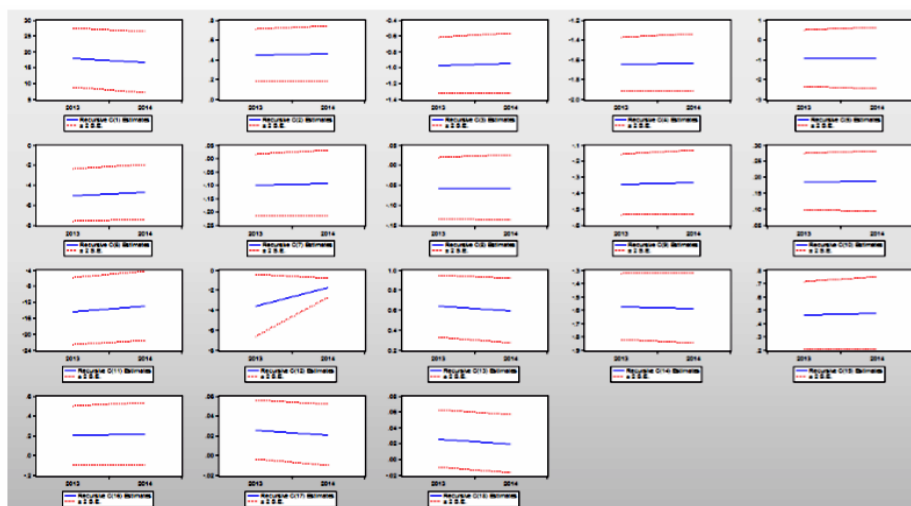
Graph 2: Recursive Coefficients estimates

Table 7: The short run estimation test

Variable	Coefficients	Standard error
C	16,59	4,85**
LGDP(-2)	-1,63	0,14*
LGDP(-1)	-0,94	0,18**
LGDP(-3)	0,45	0,13**
LTR(-2)	-4,69	1,37**
Δ LTR (-2)	-0,93	0,76
LINF(-2)	-0,09	0,06
Δ LINF (-2)	-0,05	0,04
LINV(-2)	-0,33	0,1**
Δ LINV (-2)	0,18	0,04**
LFIN(-2)	-12,97	4,3***
Δ LFIN (-1)	-1,77	0,46**
LEMP(-2)	0,59	0,13**
LBD(-2)	0,47	0,13**
Δ LBD (-2)	0,21	0,15
AO	0,02	0,015
OI	0,019	0,018
Variable	Coefficients	Standard error
C	16,59	4,85**
LGDP(-2)	-1,63	0,14*
LGDP(-1)	-0,94	0,18**
LGDP(-3)	0,45	0,13**
LTR(-2)	-4,69	1,37**
Δ LTR (-2)	-0,93	0,76
LINF(-2)	-0,09	0,06
Δ LINF (-2)	-0,05	0,04
LINV(-2)	-0,33	0,1**
Δ LINV (-2)	0,18	0,04**

LFIN(-2)	-12,97	4,3***
Δ LFIN (-1)	-1,77	0,46**
LEMP(-2)	0,59	0,13**
LBD(-2)	0,47	0,13**
Δ LBD (-2)	0,21	0,15
AO	0,02	0,015
OI	0,019	0,018

*, **, *** means individual coefficients are significant at 1%, 5% and 10%

R-sqr = 0, 99 and Prob (F-stat) = 0, 0009*

4.5. The long run analysis

To discover if there is a long-run relationship among variables under the bounds test approach formulized by Pesaran, et al. (2001). The unrestricted Error Correction model is the pertinent technique according to the literature.

5. Discussion

The null hypothesis of co-integration relationship is tested by the F-test related to lag level coefficients. The F-stat will be computed via Wald test which gives the main significance of the variables coefficients. The null hypothesis is:

c(1)= c(4)= c(6)= c(7)= c(9)= c(11)= c(13) = c(15) = 0 : meaning that there is no long-run relationship between variables. The usually procedure is to compare the F-stat with the critical value, upper and lower bound, formulated by Pesaran, et al.(2001). According to Pesaran, et al. (2001), The F-stat is computed and compared with the critical value (upper and lower bound) given by Pesaran et al (2001). The hypothesis of no cointegration will be rejected if the F-computed exceeds the upper critical bound. But, when the F-computed is less than the lower critical bound, we will accept the null hypothesis, concluding that there is no long-run association between the variables. In a particular case, an F-value between the lower and upper bounds don't give a final conclusion. In fact, the value of our F-statistic is 71, 84 and we have k = 9 variables in our model. The results are concluded from the Bounds Test tables of critical values:

Table 8: Co-integration Properties

Dependent variable	F-statistics	Critical Bound at 5%	
		Lower bound	Upper bound
• ΔLGL	71,84	2,14	3,30

As the value of our F-statistic exceeds the upper bound at the 5% significance level, we are able to conclude that there is an evidence of a long-run relationship between series. In order to interpret the UCEM coefficients, we must calculate the long run elasticities:

$\xi LGDP/LTR = -(\frac{\theta 0}{\theta 1}) = -0.35$	$\xi LGDP/LFIN = -(\frac{\theta 0}{\theta 4}) = -0.12$
$\xi LGDP/LINF = -(\frac{\theta 0}{\theta 2}) = -18.11$	$\xi LGDP/LEMP = -(\frac{\theta 0}{\theta 5}) = 2.76$
$\xi LGDP/LINV = -(\frac{\theta 0}{\theta 3}) = -4.93$	$\xi LGDP/LBD = -(\frac{\theta 0}{\theta 6}) = 3.46$

In the long-run, one percentage increase in trade terms (LTR) leads to 0, 35 % decrease in economic growth (LGDP). The coefficient of trade is negatively linked with LGDP contrary to Grossman and Helpman (1992) who argued that Trade openness enhance positively economic growth. However, the coefficient of Inflation (LINF) is not significant and has no link with LGDP. Our results don't confirm also the findings of Barro and Easterly (1998). The FDI flow (LINV) and the private financial sector credits (LFIN) have a negative impact on LGDP. Each supplement unit invested causes a loss of 5 units in LGDP value. The credit provided by private financial system inhibits economic growth due to an unorganized financial system which not efficient in term of providing financial resources needed to finance the investments. Our results don't confirm the findings of Levine and Zervos (1992) and Blonigen & Wang (2004) whom found a positive effect of credit growth rate and FDI flow on economic growth. In other side, we found that unemployment rate with tertiary education (LEMP) had a positive effect on LGDP. This can be explained by the high demand of foreigner and domestic firms to the less paid and qualified labor force. Thus, the government expense (LBD) plays a positive role in enhancing economic growth. Its coefficient is significant and impact positively economic growth. This result confirms also the findings of Barro (1991).

Now, we can check the short-run association of our model. The main output is represented in the next table:
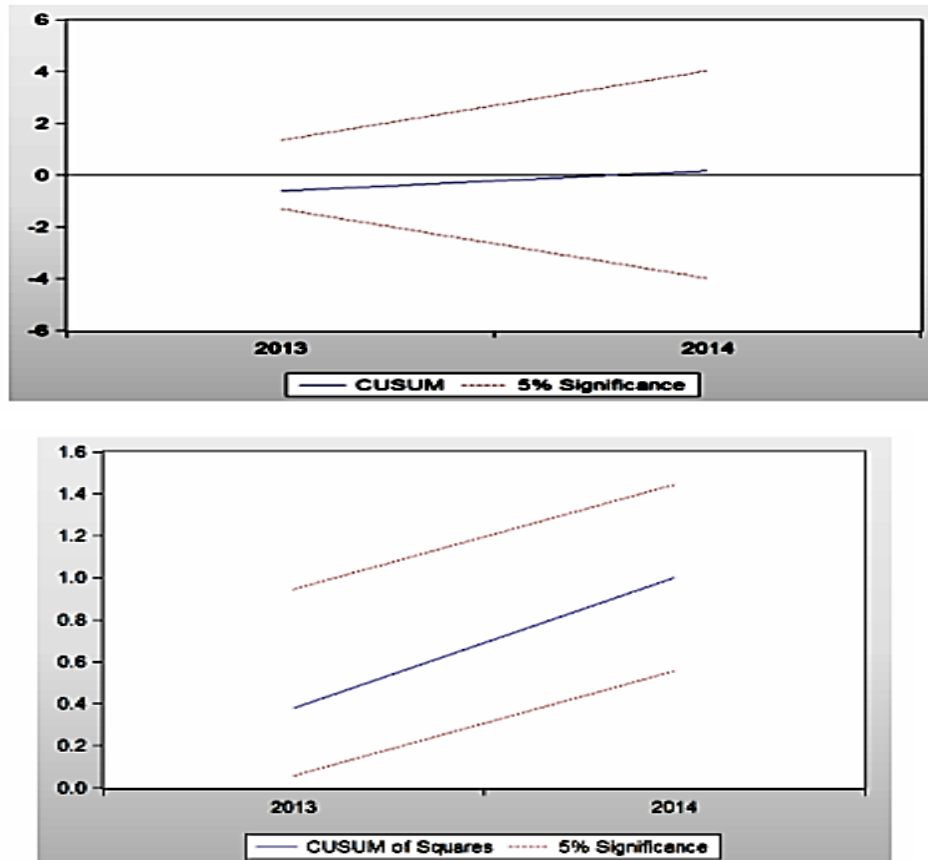
Table 9: Error correction estimation results

Variables	Coefficients
LGDP(-3)	1.67 *
LGDP(-1)	0.76**
LTR(-2)	-1.96
LINF(-2)	-0.1
LINV(-2)	0.21
LFIN(-1)	-5.67*
LEMP(-2)	-1.14**
LBD(-2)	1.41*
ECT(-1)	1.41*
ECT(-1)	0.0097**
Adj-R = 0,71 , Prob (F-stat)= 0,002	
Wald test: Prob(F-stat) =0,0017	

*, **, *** means individual coefficients are significant at 1%, 5% and 10%.

Next, we will make sure that our model is stable by referring to CUSUM and CUSUM- squared tests proposed by Brown et al. (1975). We notice through the Figure 1 and 2 that the plot of CUSUM and the plot of CUSUM-squared statistics stay within the two critical bounds. So, we can say that our model is generally stable:

Graph 3: stability tests

In table 9, we must have a negative and significant coefficient of error correction so that our results are satisfactory. In our case, it is between -1 and 0 and significant at 5%. So, the ECM is generally significant. We conclude that this system is getting adjusted towards long run equilibrium at a speed of 0, 97%. The coefficient of error-correction term is very small suggesting a slow rate of adjustment toward equilibrium. Moreover, to check the existence of short-run association between variables, we will use again Wald test. The p-value of Wald test is significant, so we accept the alternative hypothesis.

So, we conclude that there is a short-run causality running from independent variables to dependent variables. In the short-run, the foreign investment (LINV (-2)), inflation (LINF (-2)) and Trade terms (LTR (-2)) do not significantly affect economic growth. The credit provided by private financial (LFIN (-1)) system and unemployment rate with tertiary education (LEMP (-2)) are significantly and negatively affected the economic growth. 1% increase of LFIN (-1) and LEMP (-2) will lead respectively to 5, 67% and 1, 14% decrease in LGDP. However, the government expense (LBD (-2))

is significant and have a positive influence on economic growth. 1% increase in LBD (-2) will lead to 1, 41points increase in LGDP.

6. Conclusion

The aim of this paper is to identify the economic policies that must be revisited by Tunisian government in short-run term and the policies that could be upgraded to foster economic growth in long-run term. More precisely, we attempt to examine this issue using the ARDL bound test approach in Tunisian case over the period 1990-2014.

Our finding draws some conclusions and implications for economic policy. We conclude that at a higher rate, inflation holds statistically insignificant and have a permanent negative impact on economic growth. Referring to Barro (1995), inflation doesn't affect directly economic growth. It reduces both the level and the efficiency of investment which also adversely affects economic growth. The Tunisian government is not able to manage smoothly the economy in long-and short-run. The high inflation rate is a proof that policy makers have failed to prevent macroeconomic instability. It is due to the imbalance between supply and demand, the lack of economic control, in addition to imported inflation. The high inflation rate is absolutely a cause of negative effect of investments on economic growth that we found in our results. If inflation is considered as hard to predict by economic agents, the foreigner's investors don't like to invest their money in an uncertain and risky business environment. So, Tunisian government is called to increase the independence of the Tunisian Central Bank so it will design more credible and efficient monetary policies. The government has not yet reacted to this situation and it is really urgent to put in place a coherent strategy for the fight against inflation in long-and short-run. The enforcement of price administration policy used by government is not well-enough in short-run.

The financial policy in Tunisia contributes negatively in economic growth in short-and long-run terms. The private sector alone is not able to provide enough financials resources to the small and medium firms which represent the big part of industrial sector. Policy makers must put into action and immediately some reforms to ameliorate the contribution of financial and banking system in a quality growth conducive to employment creation. We suggest facilitating the merger of private and public banks to be competitive and to solve the lack of necessary long-run credits, obliging them to be effective in supporting state development policies. Therefore, the size of Tunisian stock market is small and low competitive. The financial policy must introduce more attractive fiscal incentives to the small and medium firms to enter the stock markets; this can provide them with more financial resources. Then, the internationalization of stock market, by establishing consortiums with the most competitive stock markets in the developed countries, will afford more advanced technological updates to the national stock market.

Tunisian tax system is not suitable to the new attempt to realize a democratic transition. It's regarded as a complicated, unfair and inefficient from an economic point of view. The government expenses have a positive impact on economic growth. However, it's not enough to ensure the operation of its public services. It is imperative to initiate a reform of the tax legislation at all levels to boost growth in long-run term. It is crucial to

accomplish the social cohesion from the time of revolution until the next generations. The problem is not how to increase or decrease taxes, but how to prevent tax evasion, managing these resources and providing attractive fiscal incentives to investors. Taxes must be levied on the high incomes more than on the low and medium incomes. Also, Pressure has to be focus on the companies that accumulated its unpaid taxes. Therefore, the government has to upgrade its fiscal policy by establishing an oriented reform tax justice based on the participation of citizens and a local tax suited to the regional development strategy.

Moreover, The FDI flows don't have any instantaneous impact on economic growth due to many reasons such as the instable investment environment, the heaviness of administrative procedures, and the existence of many frozen and canceled investment projects and the lack of internal funding. The government role is more efficient than the private sector in terms of devoting necessary funds in the economy. The Tunisian government exerted a crowding out effect on private sector when it borrows large amounts of capital. So, the public sector spending replaces, or drives down, private sector spending. This can increase interest rates and discourage individuals and businesses from borrowing money, which reduces their spending and investment activities. The policy makers must rebuild a new attractiveness policy for the long-run term able to attract effective projects able to absorb the qualified labor force.

The trade terms is not contributed to economic growth because of the continued trade balance deficit related to the deterioration of exports value (due to the decline in domestic production of hydrocarbons, energy, phosphates and olive oil exports and also the slowing down of Tunisians industrial products exported to the euro area characterized by a lower growth). The trade policy has to be upgraded in the short-run term. Tunisia must open its trade internationally more than regionally. Policy makers have to enforce commercial link with the European traditional partner and establish new international agreements with the Asian and African markets which represent a huge potentialities and opportunities.

Tunisia's lack of high skilled jobs is due to low private sector investment worsened by the poor business environment. There is a mismatch of high skilled labor to the needs of labor market is a big problem to Tunisia. In fact, the demand for low skilled labor force exceeds the need for high skilled labor. The educational system offers a large stock of human capital but with a low quality, worsened by the small capacity of the national labor market in absorbing the big amount of young graduates and the complicated procedures of recruitments. The most of young graduates are absorbed by the informal sector and the vacant jobs. These kinds of jobs are not stable due to the violation of employees' rights and firing risks. The employment policy must be the center of the preoccupation of the government. A good employment policy might guarantee a better employment legislation protection for these kinds of temporary jobs and to enlarge the capacity of public sectors hiring. The government has to elaborate an employment policy that focus in big part on the transition from university to work. This employment policy must be decentralized but controlled by the government and some civil society associations to ensure transparency and fairness. Therefore, there is a need for an urgent collective action, which includes together the education unions with governmental and civil institutions, to regulate the educational system.

Finally, our main findings indicate that Tunisian's disappointed economic growth results from bad designed and misguided economic policies. We argue that macroeconomic stability policy, trade policy and financial policy are the most urgent policies that matter most for Tunisian economic recovery after the revolution. However, employment, attractiveness of foreign investments and the fiscal policies can be a part of the long-run term agenda of the government. In fact, we argue that policy reforms cannot succeed without a high social awareness and participation in the fight against terrorism as a primary policy to save the economy. This new debate makes us wondering about the impact of economic costs of terrorism on economic growth in Tunisia.

References

Alberto F. Alesina, Silvia Ardagna (2009):ʻLarge Change in Fiscal Policy: Taxes versus Spendingʻ. NBER. Working Paper No.15438

Barro, Robert J. (1979):ʻOn the determination of the public debtʻ. Journal of Political Economy 87, 940--971.

Barro, Robert J. (1990):ʻGovernment spending in a simple model of endogeneous growthʻ. Journal of Political Economy 98(S5): 103-125.

Barro, Robert, (1991):ʻEconomic Growth in a Cross-Section of Countries,ʻ Quarterly Journal of Economics, Vol.106, No.2, pp.407-43.

Barro, Robert, (1995):ʻInflation and Economic Growthʻ. NBER Working Paper, 5326.

Blonigen, B. A., & Wang, M. (2004):ʻInappropriate pooling of wealthy and poor countries in empirical FDI studies,. NBER Working Paper 10378. National Bureau of Economic Research, Cambridge, MA.

Durlauf, S. N., Johnson, P. A., and Temple, J. R. W. (2005):ʻGrowth econometricsʻ. In P. Aghion and S. N. Durlauf (eds.) Handbook of Economic Growth, Volume 1A, North-Holland: Amsterdam, 2005, pp. 555-677.

Fischer. Stanley (1993): ʻThe Role of Macroeconomic Factors in Growth ,. NBER WPS No. 4565.

Fisher, Stanley, (1993): ʻThe Role of Macroeconomic Factors in Growth,ʻ Journal of Monetary Economics, Vol. 32 (December 1993), pp. 485-512.

Goldsmith, R.W. (1969):ʻ Financial Structure and Developmentʻ. Yale University Press. Vol. 80, No. 318 (Jun., 1970), pp. 365-367

Gurley J.G. and E.S. Shaw (1955):ʻFinancial Aspects of Economic Developmentʻ, American Economic Review 45, n° 4, pp. 515-38.

King R.G. and Levine R. (1993):ʻFinance and Growth: Schumpeter May Be Rightʻ, Quarterly Journal of Economics 108, pp. 83-109.

Levine R. (2002):ʻBank-Based or Market-based Financial System: which is better?ʻ. Journal of Financial Intermediation, pp. 398-428.

Levin.R. (2005):ʻFinance and Growth: Theory and Evidenceʻ, chap 12 in Aghion. P. and Durlauf S. (eds.), Handbook of Economic Growth, Elsevier.

Levine.R, S. Zervos (1998):ʻStock Markets, Banks and Economic Growthʻ, American Economic Review, pp. 537-558.

Mchinnon, R.I. (1973):ʻMoney and Capital in Economic Development, Washington: The Brookings Institution.

Panizza, U. (2008):ʻDomestic and External Public Debt in Developing Countries". Paper presented at the United Nations Conference on Trade and Development (UNCTAD). Discussion Papers 188. New York City.

Pesaran, M. H. and R. P. Smith, (1998):ʻStructural analysis of cointegrating VARsʻ. Journal of Economic Surveys, 12, 471-505.

Pesaran, M. H. and Y. Shin, (1999):ʻAn autoregressive distributed lag modelling approach to cointegration analysisʻ. Chapter 11 in S. Strom (ed.), Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium. Cambridge University Press, Cambridge. (Discussion Paper version.)

Pesaran, M. H., Shin, Y. and Smith, R. J., (2001):ʻBounds testing approaches to the analysis of level relationshipsʻ. Journal of Applied Econometrics, 16, 289–326.

Robert G. King and Ross Levin (1993):ʻFinance and Growth: Schumpeter might be rightʻ. Financial Policy and system, the World Bank, WPS 1083

Robert J. Barro, Xavier Sala-i-Martin. (1990):ʻPublic finance in models of economic growthʻ. NBER. Working Paper No. 3362.

Romer, David. (2001):‚Advanced Macroeconomics, second editionʻ. Textbook.

Stanley Fischer (1993): ‚the role of macroeconomic factors in growthʻ. NBER Working Paper No. 4565.

Tirole J. (2006):ʻThe Theory of Corporate Financeʻ, Princeton University Press.

Clemente, J., Montañés, A., and Reyes, M. (1998):‚Testing for a unit root in variables with a double change in the meanʻ, Economics Letters, Vol. 59, pp.175- 182.

Pesaran, M. H. and R. P. Smith (1998):‚Structural analysis of cointegrating VARsʻ. Journal of Economic Surveys, 12, 471-505.

Pesaran, M. H., Shin, Y. and Smith, R. J.(2001):ʻ Bounds testing approaches to the analysis of level relationshipsʻ. Journal of Applied Econometricsʻ, 16, 289–326.

Phillips, P. and Perron, P. (1988):‚Testing for a Unit Root in Time Series Regressionʻ, Biometrica 75(2), pp. 335-346.

Toda, H. Y and T. Yamamoto (1995):‚Statistical inferences in vector autoregressions with possibly integrated processesʻ. Journal of Econometrics, 66, 225-250.

Zivot, E. and Andrews, K. (1992):‚Further Evidence on the Great Crash, the Oil Price Shock, and the Unit Root Hypothesisʻ, Journal of Business and Economic Statistics, 10 (10), pp. 251–70.