Determinants of Economic Growth in Tunisia and the Role of Women

Diana Ekman

Undergraduate Economics Thesis

Haverford College

Advisor: Professor Banerjee

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Abstract

This paper examines economic growth in Tunisia and the role that women have played in that growth. Economic growth is evaluated by considering contributions to GDP growth, changes in productivity and employment ratio and social indicators to determine sources of growth. The results show that women did positively impact Tunisia's economic growth through increased labor force participation, increased working age population to total population ratio, and increased consumption.

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I. Introduction

Tunisia became independent from France in 1956, and has had a relatively stable political system ever since. The government is a bicameral parliamentary system, but in reality is controlled by the Constitutional Democratic Rally party and has had only two presidents since independence (Sadiki, 2002). At the time of Tunisia's separation from France, Tunisia's economy was mostly in the domain of the public sector. The government owned the banks, manufacturing firms, and oil production facilities. When oil prices increased in the 1970s, Tunisia's income went up sharply, since petroleum products were more than one-half of all exports during the 1970s. This high level of income allowed Tunisia to grow faster than average for the Middle East and North Africa (MENA) region (Table 1), even though the economy was mostly dominated by the public sector. During this time of high income, the investment rate was also high, especially in manufacturing capital and human resource development.

In the early 1980s, dwindling oil reserves and lower oil prices combined to drastically reduce Tunisia's oil revenues, but the high levels of investment and public spending were maintained. High spending, along with the associated debt accumulation, contributed to macroeconomic instability, which led to increases in the inflation rate, current account deficit and external debt. Government spending increased substantially during the oil boom period in the late 1970s and early 1980s. This government spending also helped to increase domestic spending, which increased demand for domestic goods, including manufactured goods. The government also invested some of the income from the oil exports in human capital development, in order to promote technological growth in the future.

In the mid-1980s, the Tunisian government began a stabilization and adjustment program supported by the IMF to stabilize the Tunisian economy. Policies in this program included

devaluing the Dinar, decreasing the rate of growth of the money supply, privatizing public assets, and increasing interest rates. Tunisia stabilization policies helped to calm inflation and were intended to attract foreign investment (Rzigui, 2007).

In the 1980s and 1990s the Tunisian government continued to create policy to deregulate its economy to help its growing manufacturing sector find a place in the global market. It created a free trade agreement with the European Union, including its historical top trading partners, France and Italy, as well as an agreement with the other North African nations. Tunisia's terms of trade dropped with the fall of oil prices, but have been fairly steady since the early 1990s. The percent of GDP that is made up of exports and imports has increased approximately 20% since the 1970s; this shift means that manufactures are currently a major form of Tunisia's income (Hassan, 2004). Firms that manufacture for export have grown the most since the early 1990s, when exporting firms were given economic supports, such as tax breaks, to try and increase Tunisia's exports to improve its current account balance (Lahouel, 1998). One of the sectors of manufacturing that grew particularly fast in this time period was textiles, where most of the workers are female. One way in which economic policy is still lacking is that firms that made products for export still have a distinct advantage over firms who produce domestic goods, because this means that export oriented firms have lower costs. The goods and services for export sector is another place where the Tunisian economy could expand, as it would provide a much needed source of employment in a country where unemployment is relatively high.

The high level of rights for women in Tunisia's society is one factor that sets it apart from other MENA countries. At the time of Tunisia's independence from France in 1956, the Tunisian government decided that it was important to the development of the country that women's rights be protected. In 1956, the Personal Status Code enacted many rights for women

including the outlawing of polygamy, legal divorce that could be requested by either spouse, and the dowry as the property of wives. The Tunisian government also believed that decreasing fertility could potentially increase economic growth, and was the first MENA country to introduce a family planning program in 1964 (Brown, 2007). The family planning program aimed to reduce the fertility rate by providing education to women, female sterilization, and other forms of birth control in both urban and rural areas. The Tunisian government also increased the legal age for marriage for women to 17 to help decrease the birth rate. Between 1962 and 2007, the fertility rate dropped from 7.18 births per woman to just above two, which is the population replacement level, which is the level needed to maintain the current population size.

This thesis will examine economic growth in Tunisia, and the role women have played in that growth. The first stage will analyze the contributions of consumption, investment, and net exports in GDP growth. The next will examine how productivity (GDP/L) and employment ratio (L/N) have changed over time, and how the involvement of women in the economy has changed. The final stage will analyze the social indicators in Tunisia and evaluate how the causes and benefits of Tunisia's higher than average economic growth have been distributed by socio-economic status and gender.

II. Literature Review

There are two important topics to investigate in looking at the role of gender in the economic development in Tunisia. The first factor to consider is what variables impact economic growth, and the second is what role gender plays in those variables.

There have been many studies on the economic development of Tunisia, particularly since Tunisia has had a higher than average growth in GDP in the MENA region. These studies focused on several variables in economic growth of countries such as: demographic variables including labor force participation; policy variables, such as openness of the economy and public savings rates; and resource variables, like resource prevalence.

Many authors have considered the link between demographic variables and economic growth in MENA and Tunisia. One major factor in economic growth is the structures of the labor force which includes the participation rate, the distribution across sectors, how many women are involved, and the education level of the labor force. Manufacturing is a large sector in the Tunisian economy; in 1988 47% of total exports were in manufacturing. In textiles, leather and garment industries women make up 76.5% of the total workforce (Moghadam, 1998). The health and size of the manufacturing sector in Tunisia is important because a substantial portion of GDP in Tunisia comes from manufacturing.

Tunisia has a very high unemployment rate for a country with its level of stability and economic growth. This high unemployment was probably caused by fiscal cuts were a part of the IMF sponsored stabilization and structural adjustment program, because there was not great enough economic growth to make up for all the jobs lost due to these fiscal cuts (Rivlin, 2001). An increase in labor force participation when there is already high unemployment could be problematic since, high unemployment will drive down wages.

Policy has an important affect on the economic growth of countries over time, and several authors investigated the connections between government policies and institutions and economic growth. Policy has changed greatly in many MENA countries since the 1970s, because of oil booms and busts, and the involvement of the IMF in a stabilizing and structural readjustment program for several MENA countries, including Tunisia. Tunisia's markets were highly regulated from since its independence until 1986, when the government began to make structural changes to solve the problems of a large balance of payments deficit and high inflation (Lahouel, 1998). Since that time Tunisia's economy has become significantly regulated in several ways. When Tunisia was industrializing it had a policy of import substitution to protect domestic manufacturing, in 1986 it began to get rid of those tariffs to open up its economy to international trade. The government changed monetary policy to decrease the growth of domestic credit and money supply, and to focus monetary resources into the private sector instead of the public sector (Rivling, 2001). Structural adjustments were made to open the economy by privatizing previously public sectors, eliminating subsidies and getting rid of price controls (Lahouel, 1998). Public spending was also reduced starting in 1986, by which time taxes had climbed to 23.1% of GDP, which would have considerably dampened the growth of Tunisia (Morrison and Talbi, 1996).

Resource and initial conditions are very important to explaining the long term economic growth of a country. Tunisia is an oil exporter, and while it has a small enough oil supply that its oil has never been a significant portion of global supply, in 1980 oil products made up 52.5% of Tunisia's exports. Tunisia's oil exports have decreased over time, and other sectors of the economy have grown by 2001, oil products made up only 9.2% of exports. Other natural resources include natural gas, which has been steadily decreasing in supply and production over

time, and phosphates, which are of relatively low quality (Hassan, 2005). Initial conditions also include the level of human capital of the labor force, such as education. The average number of years of secondary school enrolled in per capita in 1965 in MENA was 0.24, on average; every person was enrolled in less than one year of secondary school (Williamson, 2002). The initial levels of education are important because more education causes more productive workers who cause more growth.

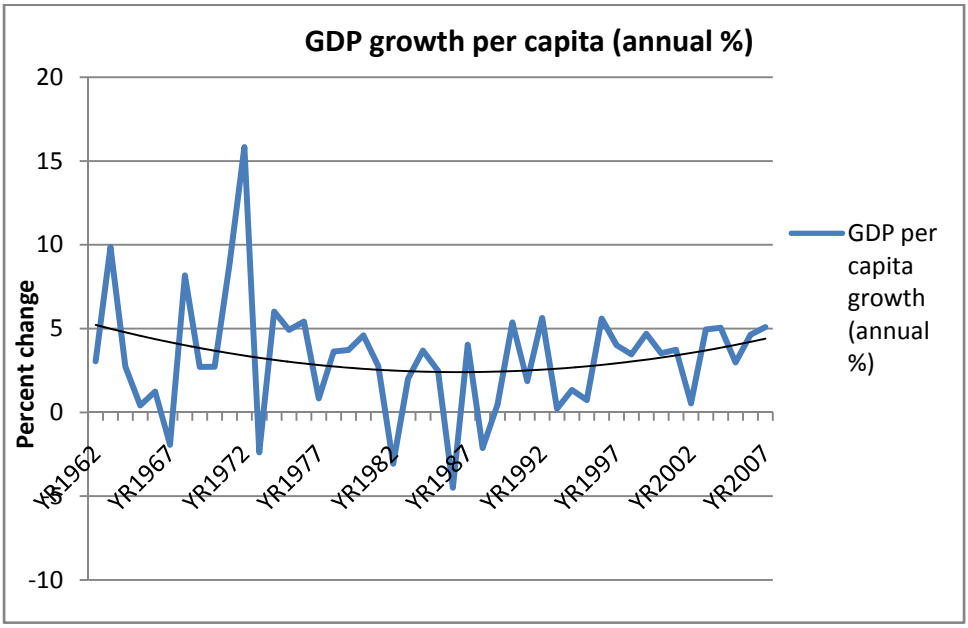
Some studies have included the impact of gender equality on economic growth. Klansen (2005) grouped countries by initial gender equality conditions, and looked at correlations between increases in gender equality and pro-poor economic growth, several connections were found. Low initial fertility was associated with pro-poor growth. Pro-poor growth is desirable because it could lead to higher long term economic growth than more unequal growth. Increased female-to-male ratios in school enrollment, and increased literacy rates were also associated with a higher rate of pro-poor growth. Another important connection made is that higher female labor force participation rates are correlated with higher rates of pro-poor growth (Klasen, 2005). Another study compared gender inequality in education in MENA to gender equality in other regions of the world to attempt to see what the effect of gender in education in MENA has been. The study determined that the cost of the gender gap in education was 0.7% GDP growth per capita per year because of lost worker productivity. This study also found that the integration policy of Tunisia has had a positive impact on the number of employed women, because a large portion of the export production that Tunisia's policies encourage is in textiles and clothing, a sector where more than 80 percent of workers are women (Klasen and Lamanna, 2003). Despite this, the unemployment rate for women, 16.2% in 2003, was higher than the general unemployment rate of 14.5%.

One reason female unemployment might be higher than total unemployment is the gender wage gap in Tunisia. The adjusted gender wage gap in Tunisia in 2001 was .15, meaning that if women were compensated equal to men based on their education and experience; they would be paid 15% more (Klasen, 2005). Women are also concentrated in certain sectors of the economy. The female share of employment in government was 24.5%, in medicine 20.6%, and in teaching 31.5%, women tend to be employed more in informal sectors of the economy where they need less formal education and the wage is lower. (Moghadam,1998).

There are obvious relationships between fertility rate and economic growth, with causations that go in both directions. Economic growth affects fertility because one of the main considerations parents have when they choose how many children to have is their income. In countries in the Middle East and North Africa, there was a strong, positive correlation found between fertility rate and income in an analysis of which variables impact fertility rate in MENA countries found by Gani and Ngassan (2006). One way in which fertility rate is connected with economic growth is investment. Brander and Dowrick (1994) found that there was a relationship between change in fertility rate and investment. In developed countries, when birth rate is below 3%, an increase in fertility leads to an increase in investment, when fertility is above 3%, an increase in fertility decreases investment. A possible explanation for why investment decreases with increases in fertility above a certain level is given by Thornton (2001) who says that the savings of a household will be reduced if there is a high dependency ratio. It would to be hard to examine this relationship in Tunisia because so much of investment was public investment until the Tunisian government put into effect the stabilization plan with help from the IMF. However, total investment has been on a steady rise since investment was low in the late 1980s due to cutbacks on government spending. This rise is occurring at the same time as fertility decreases,

which might indicate higher household investment due to increased resources from having fewer children. Coale and Hoover (1958) concluded that population growth leads to a shift of resources from physical capital accumulation to social structure spending, such as expenditures on health and education. Another way fertility and population growth interact with economic growth is technological progress. Tsen and Furuoka (2005) explain the supposed positive correlation between population size and technological growth by saying that a larger population means a larger domestic market, which fosters more competition amongst firms, which leads to more technological innovation. Kelley and Schmidt (1995) considered the idea that changes in population growth might have different impacts on economic growth over time. One reason for that are general variations in the global economy. Another reason is that population density increases over time when population growth stays the same, and is positive, and so increased population density might have been good in the 1960s and 1970s, but detrimental by the time the 1980s came around.

III. Economic Growth over time in Tunisia



Source: World Development Indicators

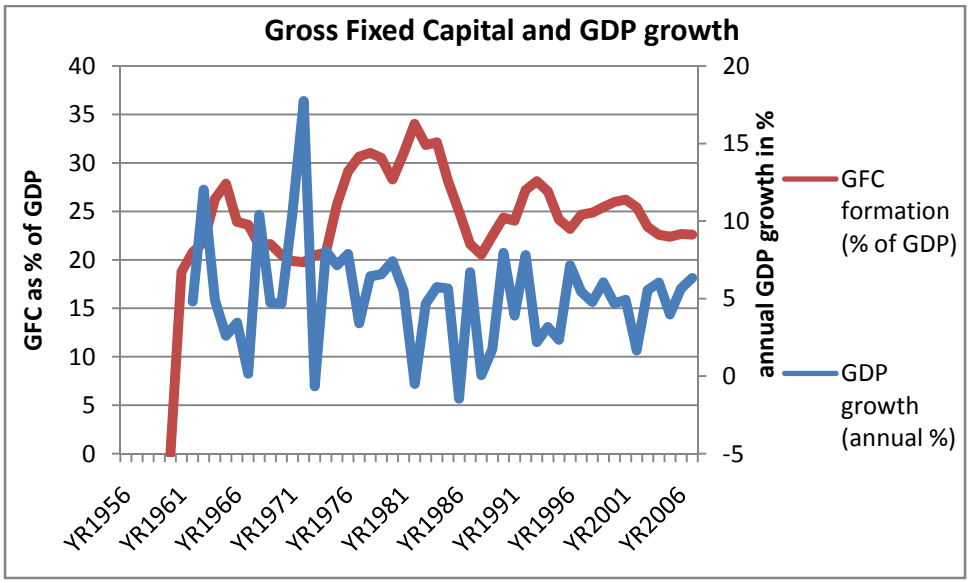
The growth of the Tunisian economy can be described generally as being u-shaped, with a higher average GDP per capita growth rate in the early 1960s, which declined until the late 1980s, when it began to rise again. During the 1960's growth in Tunisia was unstable and sluggish, the average growth rate for this period was 3.8%. The early 1970s were characterized by comparably high growth that was overall more stable, but had one large peak with two noticeable sharp drops in growth due to oil prices. GDP per capita growth fell in the late 1970s, and continued falling until the late 1980s, when it bottomed out just above zero. Growth began to slowly pick up and become more stable in the 1990s; by 2007 growth has almost returned to its 1960s levels.

A contribution to growth table (Table 2) shows the roles that consumption, investment, and net exports played in the growth of GDP over time. The factor that had the largest impact on GDP growth in Tunisia over time was consumption. The contribution of consumption over time to GDP growth can be modeled by an inverted u-shape. The peak of the effect of consumption

came in the mid to late 1980s. Investment also played an important role in the growth of GDP over time. The contribution of investment to GDP growth over time can be modeled with a u-shaped curve, with the left side higher than the right side. The higher left side of the investment contribution curve corresponds with the high investment levels in the 1970s and early 1980s. The variable with the least effect on GDP growth over time was net exports; Net export's contribution over time was minimal, as it fluctuated around zero. In the 1970s and 1980s, there were brief positive spikes of the contribution of net exports, likely due to high oil prices and volumes being exported. By the 1990s, the fluctuations in the contribution of net exports to GDP growth had decreased, but still averaged just above zero. Consumption contributed an average of 3.8% growth in GDP per year. Investment contributed an average of 1.4% growth in GDP per year; net exports contributed an average of 0.03% of GDP growth per year. (Table 2) High contributions to growth were likely caused by high government spending until the stabilization and restructuring plan, and increasing disposable income over the entire time period.

Demand Side Growth

Investment



Source: World Development Indicators

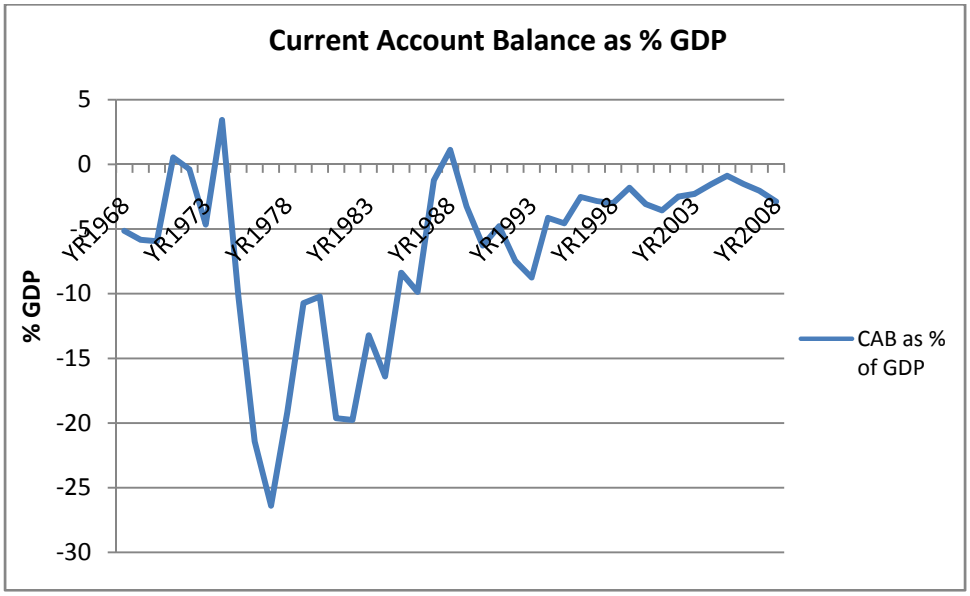
Gross fixed capital formation as a percent of GDP has increased in general over time. It was at its highest in the late 1970s and early 1980s when oil prices and income were high. The Tunisian government invested much of this income in physical and human capital development. Investment dropped drastically in 1985 when the Tunisian government began to cut its spending due to lost oil revenues, and has held steady at around 25% since then. The level of investment affects economic growth because more investment in capital means more productivity per capita, and more productivity per capita creates more future growth.

One way of evaluating the relationship between investment and growth is using the Harrod-Domar Growth Model to find the rate of growth:

$$g = \frac{I/Y}{v}$$

Where g the rate of growth, I is investment, Y is output, and v is the capital output ratio. The long term Incremental Capital Output Ratio (ICOR) from 1962-2007 for Tunisia was 5.86, meaning that over the time period 5.86 dinars of capital investment provided 1 dinar of output. This is a measure of the efficiency of capital use. Abu-Qarn and Abu-Bader (2005) found that ICOR was higher in MENA than in the rest of Africa, East Asia, Latin America, South Asia and industrialized countries, and that Tunisia had a higher than average ICOR in the MENA region. Tunisia's ICOR rose in the 1980s, at a time when investments were high, likely due to an underutilization of abundant capital. The time period where gross fixed capital was highest in the late 1970s and early to mid-1980s corresponds to an apparent decrease in growth of GDP. A smaller increase in investment in the mid-1960's also corresponds with a decrease in GDP growth.

Net Foreign Demand

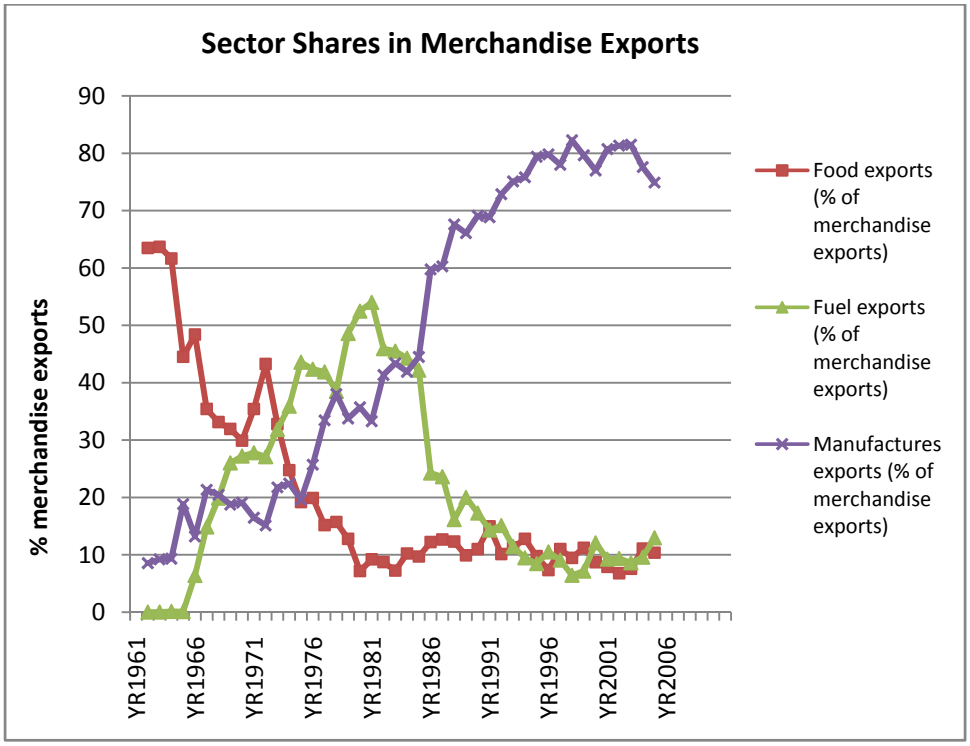


Source: World Development Indicators

The current account balance describes changes in a country's net foreign assets. Net exports over time are descriptive of net foreign demand. Tunisia's net exports over time have almost always been negative. A long term trade deficit could have an effect of the long term growth of the economy because capital has to be used to pay for the extra imports that could have been used in capital investment. Long term trade deficits can also cause currency to be devalued. However, the trade deficit in terms of GDP has gotten smaller over time, which means less capital has to be diverted to paying for the net exports. Tunisia's current account balance as a percent of GDP has varied greatly over the course of its history, and has played an important role of the economic growth of the country and the policy decisions of its government. Until the mid-1970s, Tunisia had a negative average current account balance as a percent of GDP, but the average was close to zero. In the late 1970s the current account deficit grew quickly, it was more than 25% of GDP by 1977. It decreased in 1979 and 1980, but by 1981, was back up to almost

20% of GDP. There was an extreme current account deficit for several years before 1988, when there was the first current account surplus since 1974. The current account deficit slowly began to increase again, but began to diminish in 1994, and has been less than five percent of GDP ever since. The turning point in 1994 was likely due to IMF encouraged stabilization and restructuring policy to reduce government spending, financed by borrowing, which was a contributing factor in the large current account deficits of the 1980s.

Sector Distribution

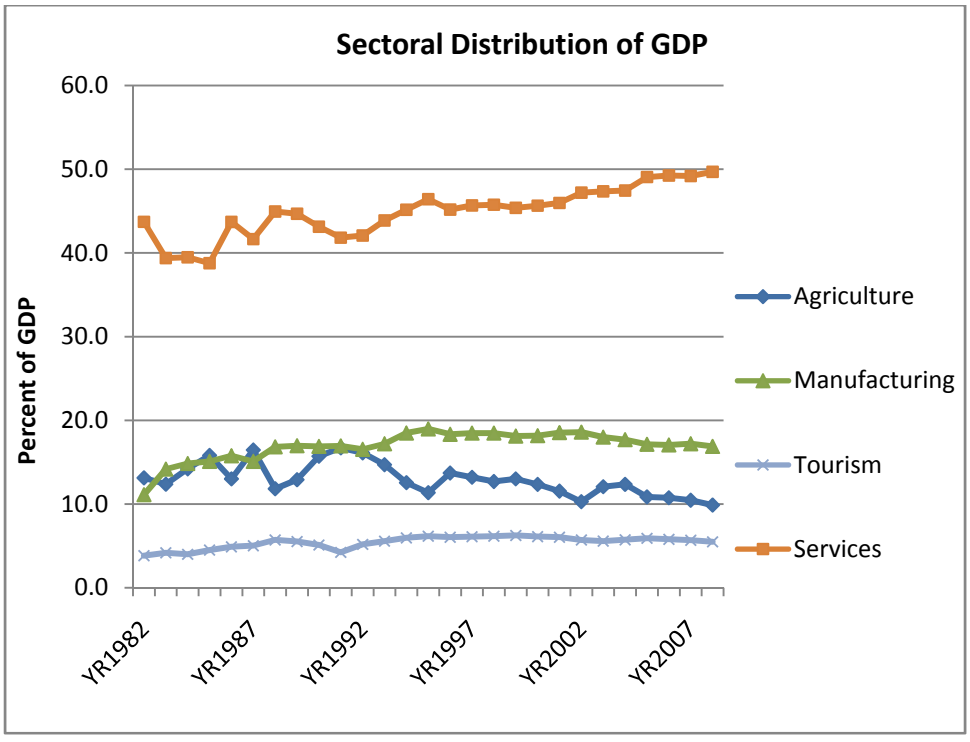


Source: World Development Indicators

In the early 1960's food and food products made up the vast majority of exports from Tunisia, more than 60%. This percentage steadily decreased as the percentage of manufactured goods and fuel exported increased drastically, starting in the mid-1960's. In 1980, the export of oil and oil products made up more than half of all exports from Tunisia, but by 2001, the exports of oil and oil products had decreased to 9.2%. This decrease was caused by a number of

variables. Oil prices dropped drastically in the early 1980s, which means that the same amount of oil exported would lead to less oil revenue. Other potential reasons for the drop oil could be the limited oil reserves in Tunisia and the growth of other sectors. The growth of the manufacturing sector was encouraged by the government by giving firms that were focused on exports financial incentives that domestic firms did not get, like federal tax breaks (Lahouel, 1998). The manufacturing sector was also encouraged by high levels of investment by the Tunisian government because of high income from high oil prices. The general trend of exports over time has been than exports of natural resources have been decreasing (i.e. ores and metals exports, and fuel, and food exports) and manufactured exports have been on the rise (Table 3). Additionally, the female share of employment in manufacturing went up from 22% in 1956 to 52% in 1975 and 56% in 1984 (Klansen, 2005).

Supply Side Growth



Source: World Development Indicators

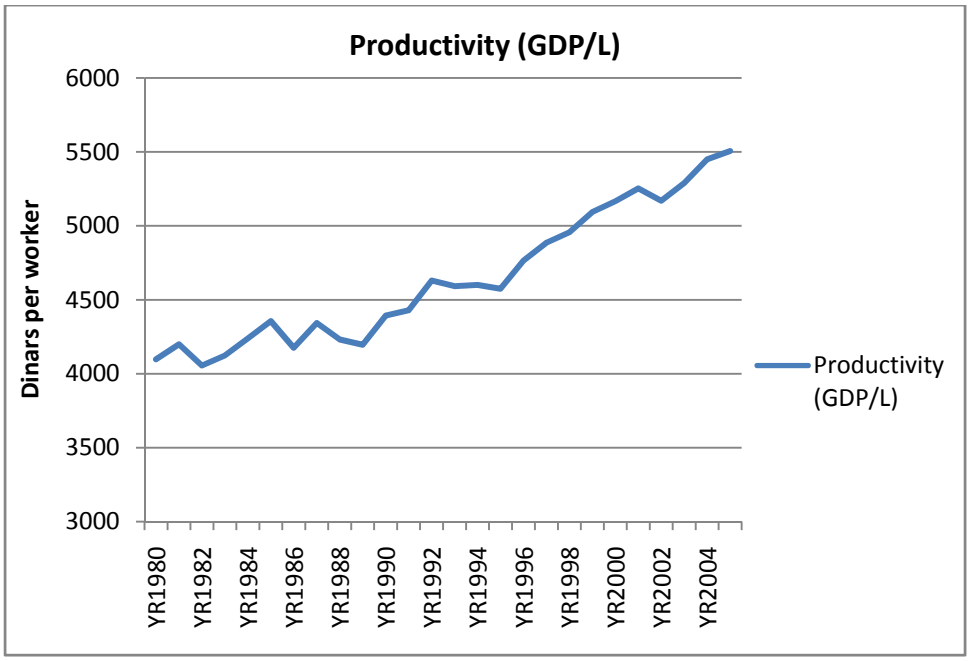
The sectoral distribution of GDP remained nearly constant for most sectors the period from 1982 to 2008. In the first half of the period, from 1982 to 1996, services as a share of GDP grew overall by about 5% of GDP, but services as a share of GDP fluctuated from year to year. In the second half of the period, from 1996 to 2008, growth of services was slower, but more consistent, and services as a share of GDP never decreased. Services made up the largest portion of GDP for the whole time period. Manufacturing increased as share of GDP from 1982-1996, but in the second half of the period growth in the share of manufacturing leveled out, and began to decline in the early 2000s. This is consistent with manufacturing decreasing as a share of goods exports during this same time period. Textile production, a subset of manufacturing, followed the same basic pattern as manufacturing as a whole by increasing from 1982-1996, and then leveling out at decreasing in the 2000s, but textile production increased at a much faster rate than manufacturing as a whole (Table 4). Agriculture as a share of GDP had a large amount of variation, but stayed more or less at the same level until 1996, and then began to decline. Government wages increased very slightly over the whole period, while tourism increased slightly from 1982-1996, and remained near constant for the second half of the time period. GDP per capita can be described in smaller supply side components. Supply side growth is driven by productivity, which describes the productivity of workers, and the employment ratio, which describes what proportion of the population works. This is described in the following equation:

$$\frac{GDP}{N} = \frac{GDP}{L} \times \frac{L}{N}$$

Where N is the population size, and L is the economically active population, the first term represents productivity, the second represents employment ratio.

IV. Employment and Labor Force

Productivity



Source: World Development Indicators

The productivity of the labor force is measured as real GDP divided by total employment. Total output is a function of capital, labor, and technological progress, so dividing output by labor shows how much of the change in output is caused by increases in productivity through capital accumulation and technological progress. This relationship is expressed in this equation:

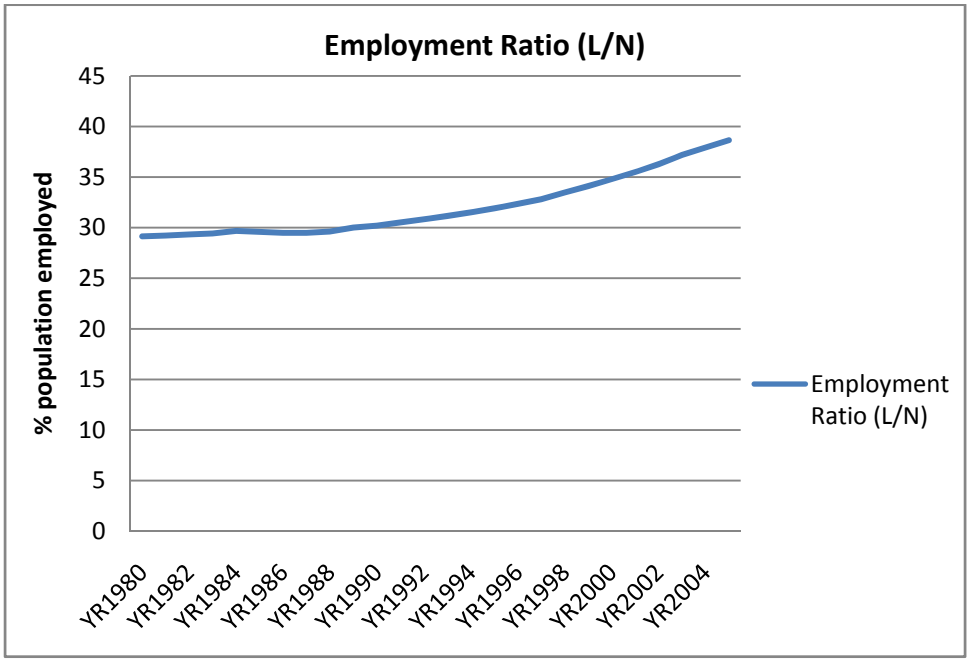
$$Y = f(K, L, A)$$

$$\frac{Y}{L} = f\left(\frac{K}{L}, \frac{A}{L}\right)$$

Where Y is output, K is capital, L is labor, and A represents technological progress. Productivity trended upwards from 1980 until 2005, with a few small decreases, and a longer three year slight decrease in productivity in the early 1990s. In the three years that productivity decreased from 1993-1995, the contributions of net exports and investment were very low or

negative. The overall upward trend of productivity means that each worker in Tunisia produced more in 2005 than they would have in 1980.

Employment Ratio



Source: World Development Indicators

Another way in which employment affects GDP growth is the employment ratio, or the amount of the total population that is economically active. The greater percentage of the population that is economically active, there are more employed members of society to support people who aren't working. The employment ratio grew by almost a third between 1980 and 2005. Growth in the early 1980s was slow, the employment ratio only increased by 1% in ten years, but by the 1990s the employment ratio was increasing at an increasing rate. This increase in the employment ratio corresponds with a dramatic increase in the 1990s and 2000s of labor force participation, particularly the participation of women.

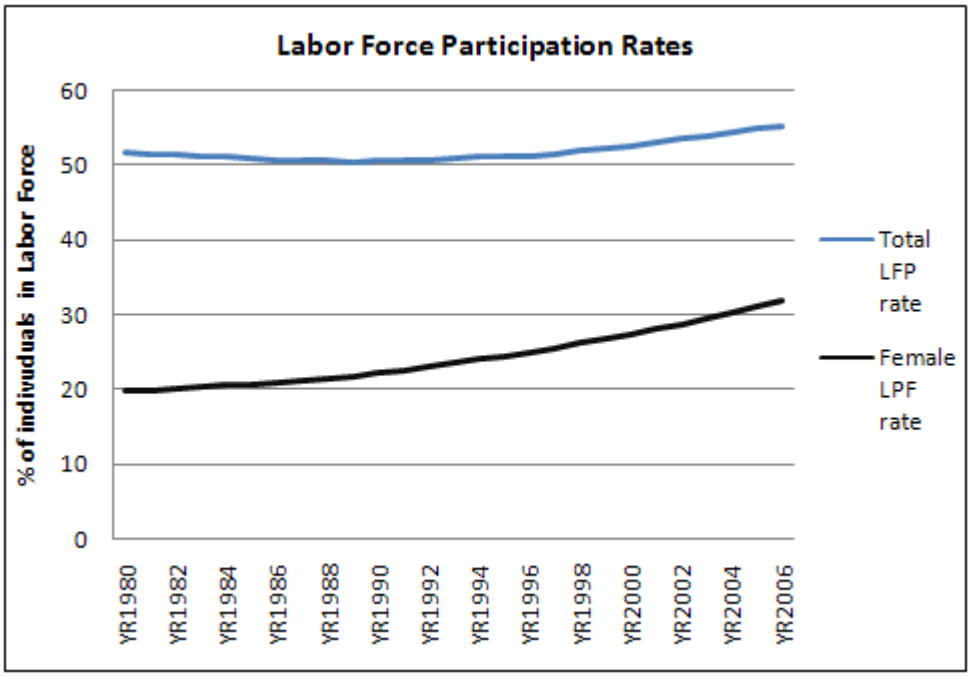
The employment ratio has two components, expressed in this equation:

$$\frac{L}{N} = \frac{L}{WAP} \times \frac{WAP}{N}$$

Where L is the economically active population, N is the total population, and WAP is the working age population. The proportion of economically active population to working age population can be evaluated by the labor force participation rate and the unemployment rate.

Labor Force Participation

The labor force participation rate is the ratio of employed population and the unemployed population to the total working age population; it shows how much of the working age population is either working or trying to find work. Labor force participation rates for women have increased faster than total labor force participation rates. Overall labor force participation growth rates were actually negative during the period from 1980 -1989. During this time growth rates for female labor force participation averaged 1.02%.



Source: World Development Indicators, LFP as % of population ages 15-64

Labor force participation has increased from 51.7% in 1980 to 55.2% in 2006. The labor force participation rate of women has climbed even faster. In 1980, the LPF for women was

19.8%, by 2006, the LPF rate was 31.9% (Table 5). There are several potential factors in this process. One could be that the decline in fertility in Tunisia made women more available to work. Another potential factor could be increased education spending, and the effort made by the Tunisian government to increase educational attainment for all children, but particularly for girls. Another possible reason is the expansion of the female dominated textile sector in Tunisia from 2.9% of GDP in 1982 to 6.7% of GDP in 2001. Hence, an increase in demand for textile workers likely led to more jobs for women than for men. One reason that there are more women than men in the textile industry is that the wage for working in textiles is low, and the wage rate for women is lower than the wage rate for men, so most women are willing to work for a lower wage than are men. Another reason that it is a female dominated field is that textile work has historically been categorized as work women do.

Since labor force participation includes the unemployed population in the labor force, it is necessary to examine the change in unemployment to see what the relation between the economically active population and total population is.

Unemployment Rate by Gender (in %)

Year	1989	1997	1999	2000	2001	2002	2003	2004	2005
Total	16.2	15.9	16	15.7	15.1	15.3	14.5	14.2	14.2
Female	21.9	17.3	17.2	16.9	16.2	16.3	16.2	17.1	17.3

Source: World Development Indicators

High unemployment is detrimental to a country's growth because if there are potential workers who want to work but can't, their productivity is being wasted. Female unemployment has tended to be higher than total unemployment, which is also high for the region (Jalali, 2002). Since 1989, total and female unemployment has been decreasing, but female unemployment began increasing again in 2004, even while total employment was decreasing. This means that as

female labor force participation was rising, not all of the women joining the labor force were being employed. In addition to the higher female unemployment, in 2001 the gender wage gap in Tunisia was .15, meaning that women who were equally qualified and had the same jobs as men got paid 15% less than men doing those same jobs (Klasen, 2005).

Women in Tunisia

Tunisia has always had more involvement of women in public society than many of its neighbors, because one of the political goals when Tunisia gained independence was to create a positive environment for women as a way of stimulating social and economic growth. Since independence, the involvement of women in society has continued to increase. In 1956, the Personal Status Code guaranteed many rights for women including the outlawing of polygamy and veiling, legal divorce that could be requested by either spouse, and the dowry as the property of wives.

Education

The education of women is particularly important for economic growth because increasing the education attainment of women is linked to more pro-poor growth, which is faster growing in the long term than more unequal growth. Providing women with education allows them more opportunities to work, and it might be that a proportional higher amount of women from poorer households choose to work. Educating women in Tunisia and MENA is important, because the gender gap in education is responsible for an average of .7% loss of GDP a year in MENA from the loss of productivity in the potential labor force (Klasen and Lamanna, 2003). Enrollment in secondary school in Tunisia has gone up for both males and females, but has increased much faster for females.

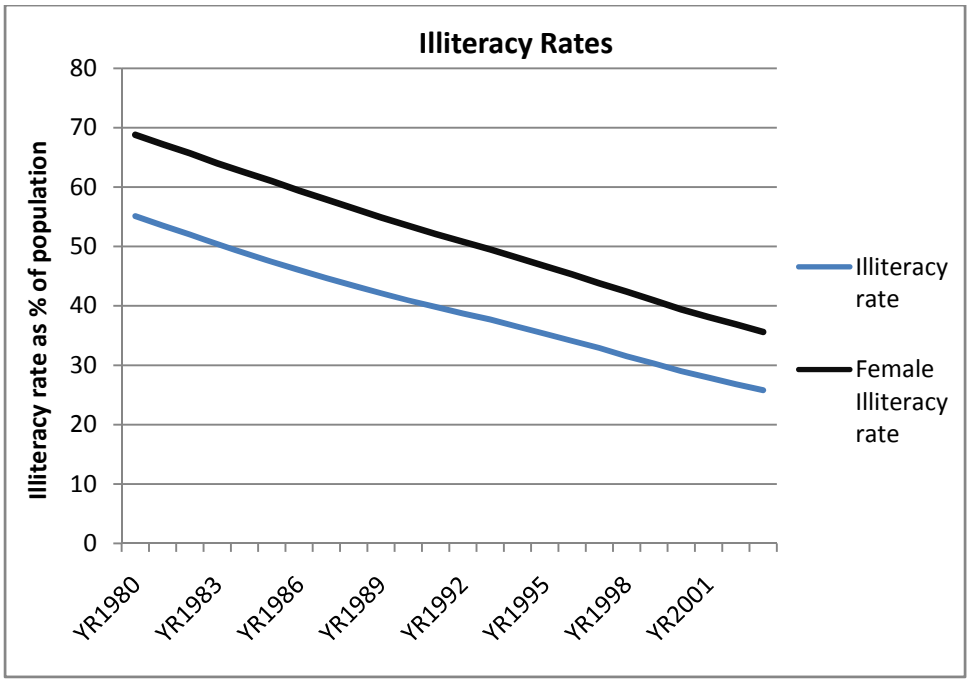
Gross Secondary Enrollment by Gender (in %)

Year	1991	1999	2000	2001	2002	2003	2004	2005	2006
SSE	44.6	72.4	74.6	76.6	77.9	76.4	80.7	83.2	84.9
SSEF	39.3	73.2	76.9	78.9	80	79.7		87.4	89.1

Source: World Development Indicators

Female enrollment used to be significantly lower than total enrollment, but over the course of the 1990s and 2000s, female enrollment increased faster than total enrollment increased, and grew to be higher than it. In 1991, total secondary enrollment was at 44.6% and female secondary enrollment was 39.3%. Over the course of fifteen years, female secondary enrollment grew at a much faster rate than the total, and by the late 1990s, female enrollment rates were actually greater than male enrollment rates. Female enrollment was already higher at 73.2% than the total of 72.4% in 2001, and by 2006 total enrollment was up to 84.9% and female enrollment was up to 89.1%.

Another indicator of the effectiveness of the education in Tunisia is the illiteracy rate. The illiteracy rate is an important factor because reading is an important skill, and it dramatically increases the job opportunities that a potential worker has, and increases their productivity as well. In Tunisia, illiteracy has declined over time, but the illiteracy rate for women is substantially higher than the total illiteracy rate throughout the time period from 1980 to 2003.



Source: World Development Indicators

While the gap of secondary school enrollment for males and females was decreasing, and then eventually reversing, the gap between total illiteracy rates and female illiteracy rates barely decreased at all. However, illiteracy decreased substantially both in women and men, the total illiteracy rate decreased by almost one-half from 55.1 in 1980 to 25.8 in 2003. The measures that the Tunisian government is taking to reduce illiteracy appear to be reaching both men and women equally.

Fertility

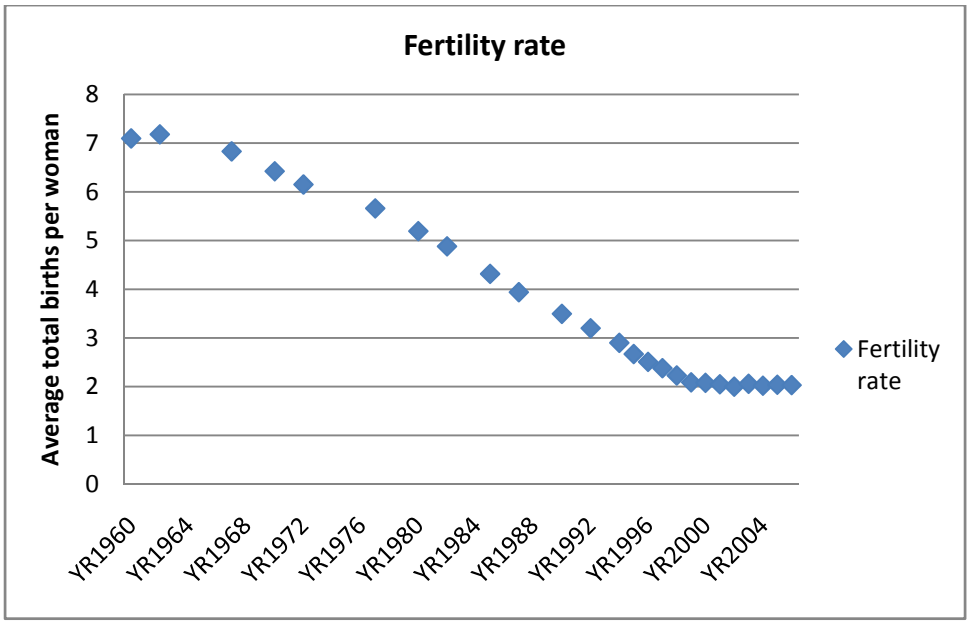
Fertility has an important impact on economic growth in two main ways. A lower fertility rate means lower population growth, which can either speed or slow growth, depending on the stage of development of the country. Lower fertility rate also can increase the labor force in the short term by allowing women to work (Tsen and Furuoka, 2005).

The fertility rate is one of the main components of the relationship between working age population and total population, and the role that this ratio plays in GDP is described in this equation:

$$\frac{GDP}{N} = \frac{GDP}{L} \times \frac{L}{WAP} \times \frac{WAP}{N}$$

Where N is total population, L is economically active population, and WAP is working age population.

The Tunisian government believed that reducing fertility was an important step in the development process, and so it created the first family planning program in the MENA region.



Source: World Development Indicators

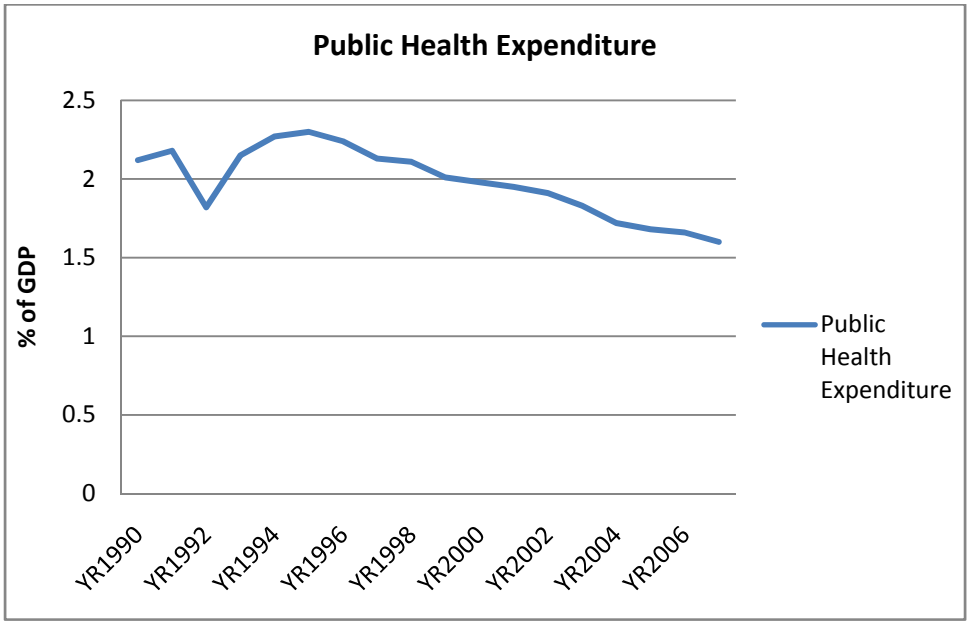
The family planning program was successful; Tunisian women went from having an average of 7.18 children each, to having just above two, which is population replacement level. At the same time that fertility was increasing, the labor force participation rate of women was increasing, along with the education of women.

V. Social indicators in Tunisia

An important measure of the development of a country is social indicators, variables that help describe the quality of life of the people who live in a country. Social indicators can also can be a way to consider human capital development in a country. Increases in the quality of things like health care and education, and decreases in poverty, have the potential to make workers more productive.

Health Care

There are several ways to measure changes in health care over time in Tunisia. One way is to simply see how government health care spending has changed over time.



Source: World Development Indicators

In 1990, public health care spending made up 2.1% of GDP, and rose to 2.3% in 1995. After 1995 health care spending steadily decreased from 2.2% in 1996 to 1.6% in 2007. This might be due to the cuts in government spending that took place as part of the stabilization and restructuring plan implemented with the help of the IMF. Health care spending as a percent of GDP does not fully describe the situation. It is possible that the health care budget is a constant

size, or even growing, but at a slower rate than GDP. It is also possible that the health care system is becoming more efficient, and has better outcome for the same amount of expenditure. For these reasons, it is important to look at other outcome health care variables; one variable that captures the effectiveness of basic health care is infant mortality rate.

Infant Mortality Rate per 1000 Births

Year	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2006
IMR	170	151	135	101	72	54	41	32	25	20	19

Source: World Development Indicators

Infant mortality rate decreases when women have more pre-natal doctor visits, when women give birth more often in hospitals or clinics, and when women have access to basic medical care for their infants. The infant mortality rate was 170 out of every 1000 births in 1960, ten years later in 1970, the infant mortality rate was down to 135 out of every 1000. In 1980, the infant mortality rate decreased by almost one-half, down to 72 out of 1000. In 1995, the infant mortality rate had again decreased by more than half to 32. The infant mortality rate almost halved again by 2006, it had decreased to 19. Each phase showed a sharper decline in infant mortality, suggesting a continual improvement in health care, at least for mothers and their children. This decline in infant mortality is likely also related to the fertility decline and education. If infants are more likely to live past their infancy, parents are likely to decide to have fewer children. Women who wait longer to have children tend to have fewer children, and women who are in their later teens or twenties tend to give birth to infants that weigh more and are healthier children than do women who give birth in their earlier teen years.

Education

Education is an important method of human capital development. Productivity is increased by education, and education can also help advance technological innovation. One way to measure investment in education is to measure public spending on education.

Public Spending on Education as % of GDP

Year	1991	1999	2000	2001	2002	2003	2004	2005
PSE	6.0	6.9	6.8	6.8	6.4	7.5	7.4	7.3

Source: World Development Indicators

Public spending on education as a percentage of GDP has gone up since 1991. In 1991, public spending on education was 6% of GDP. In 1999 that percent had increased to 6.9%, and education spending peaked in 2003 at 7.3% of GDP. By 2005, spending had decreased slightly to 7.3% of GDP, though that was still much higher than 6% in 1991. This means that education spending was not only growing at the same rate as GDP for most of this period but that, it was growing faster. One measure of the effectiveness of education is school enrollment. Secondary enrollment changed drastically over the period from 1991-2006. Gross secondary enrollment was 44.6% in 1991; in 1999 enrollment had increased by more than half to 72.4%, and by 84.9%. Increases in education should lead to higher productivity of workers and lower fertility rates, these are both trends that can be seen in Tunisia.

Poverty

Poverty affects economic growth because people who are impoverished do not have the opportunity to make much of a contribution to the economic growth of the country. There is also evidence that a fairer distribution of income leads to greater long term growth. One way to examine poverty, and how it changes over time, is to look at how fairly economic income is distributed.

GINI Index

Year	1960	1970	1980	1985	1990	1995	1997	2000	2002	2005	2006
GINI				43.43	40.24	41.66		39.8			

Source: World Development Indicators

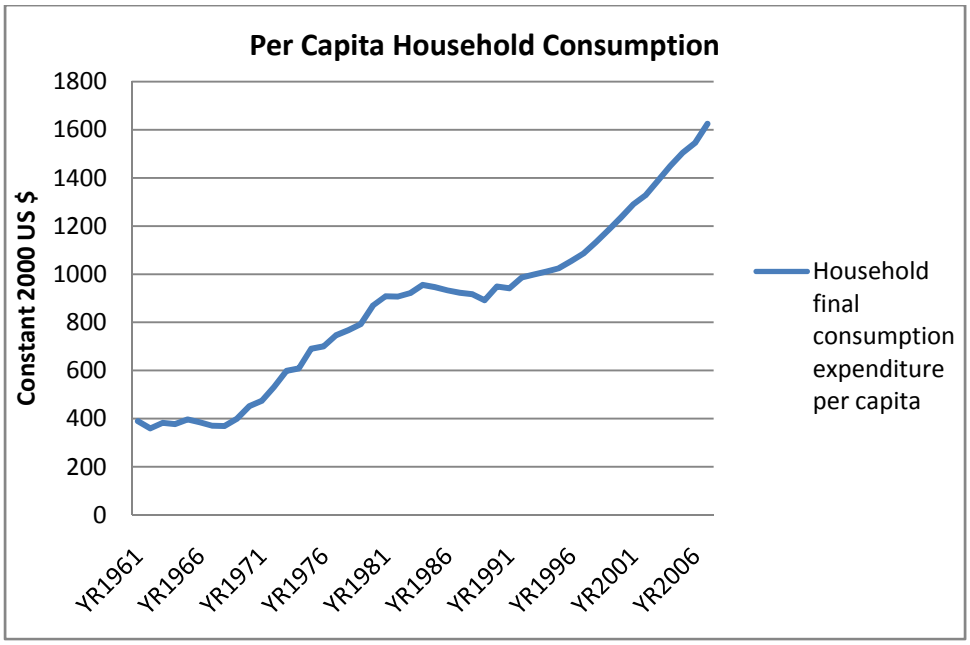
The GINI index is a measurement of the equality of distribution of income in a country. Tunisia's GINI coefficient trended downward over time, meaning that Tunisia's growth became more equal over time. In this time period, the poor have benefitted increasingly more from economic growth, which helped to reduce poverty in Tunisia.

Adult Mortality Rate per 1000 individuals by Gender

Year	1960	1970	1980	1985	1990	1995	1997	2000	2002	2005	2006
MRF	270	249	214		174		87	82	78	74	73
MRM	324	276	232		190		145	138	133	128	126

Source: World Development Indicators: Mortality Rate is defined as probability of dying between the ages of 15-60.

Another indicator of poverty is adult mortality rate, since high mortality rates suggest death from poverty by malnutrition or lack of simple medical care. Both the male and female mortality rate decreased from 1960 to 2006, which indicates a more positive living environment in Tunisia. Female mortality rates are naturally lower than male mortality rates, so the fact that female mortality rates in Tunisia are lower than male mortality rates suggests a lack of discrimination towards women's health issues.



Source: World Development Indicators

Another way to consider poverty is to consider household consumption per capita, or how much an average household spends, which is descriptive of the standard of living. Household consumption per capita has increased dramatically from 1960 to today. This increase in household spending is reflective of an overall trend of an increase in standard of living in Tunisia over time. Since growth has been getting fairer over time according to the GINI coefficient, more of that money is been spent by the lowest quintile than in the past. The fact that there is household consumption growth, and that it is being increasingly shared by the poorest part of the population, is important because there is evidence that pro-poor growth leads to more economic growth in the long term (Klasen, 2005). Decreases in poverty lead to more opportunities to continue in education, get basic health care that improves human capital accumulation, and potentially make more productive workers.

VI. Conclusion

Tunisia's economic growth was higher than average for the MENA region, and the change over time in the status of women played an important role in that economic growth. The first analysis showed that consumption had the greatest impact of GDP growth over time in Tunisia, that it had the largest positive impact on GDP growth, investment had a smaller positive impact, and that net exports had an incredibly small positive impact on economic growth. The increase of female labor force participation contributed to consumption growth by increasing the amount of disposable income household had to spend. Investment had its greatest impact on GDP in the 1970s and early 1980s when investment levels where high due to high levels of oil income. The export market became increasingly industrialized over time, in the 1960's the largest share of exports was food but, in the 1970s and early 1980s, the largest share was fuel exports, and from the mid-1980s to today, the largest share has been manufactures exports. Women were a major source of labor for some manufacturing sectors, particularly clothing and textiles, and women entering into these fields increased the ratio of the economically active population to the total population.

Over the period from 1960 to 2008 there were significant increases in both productivity and the employment ratio. Increases in education and literacy rates for women and men, as well as high levels of investment probably helped to contribute to productivity increases, so that each worker was contributing more to economic growth over time. The sharp increase of employment ratio occurred at the same time that there were labor force participation rate increases, and the labor force participation increases for women were particularly fast. At the time, fertility was falling due to Tunisia's family planning program, so that over time the ratio of the working age

population to the total population was have been increasing, because women had more time to work since they needed to spend less time taking care of the household and children.

Social indicators suggest that the quality of life in Tunisia has been increasing over time. Household income has trended upwards over time, indicating that the standard of living of the average Tunisian has improved over time. Part of this growth is due to having more members of the household working on average as women began to enter the workplace in increasing numbers. The distribution of income has also become fairer over time, meaning that poorer households benefited more from Tunisia's economic growth as time went on. This could be because women in poorer families are more likely to work than women in more wealthy families, and so the increasing amount of women working, and the income they are producing, is affecting poorer families more than others. Education and health care also improved over time, indicating a higher standard of living for Tunisians, and increased human capital investment in individuals.

The rights that women in Tunisia have been afforded have had a positive impact on the country's economic growth, but there is still room for improvement. The labor force participation rate for women is increasing at the same time that unemployment for women is increasing at a time when total unemployment is not. This means that as women enter the labor market they are having more trouble than men finding jobs, either because there are some jobs they choose not to do, or there are jobs from which they are being excluded. There is still a large gap in literacy rates for men and women, and without the ability to read, women are excluded from many jobs.

Despite these faults, the Tunisian government has historically made an effort to include women in society and the economy through policy, and it has been successful overall. Increased labor supply and increased consumption due to increased household income from having women

enter the workforce have increased the growth of the Tunisian economy. If Tunisia and other countries can create policy to fully protect women's rights and encourage them to join the workforce, they will become more productive societies and increase their potential for economic growth.

VII. Appendix:

Table 1

Country Name	Average GDP growth per capita in %
Algeria	1.56
Egypt, Arab Rep.	3.00
Iran, Islamic Rep.	2.13
Israel	2.58
Malta	5.42
Morocco	2.21
Oman	6.45
Syrian Arab Republic	2.22
Tunisia	3.11
MENA Region Average	2.06

Source: World Development Indicators, averages for years 1965-2007

Table 2

Year	Final consumption expenditure (constant LCU, in thousands)	GDP (constant LCU, in thousands)	Gross capital formation (constant LCU, in thousands)	Imports of goods and services (constant LCU, in thousands)	Exports of goods and services (constant LCU, in thousands)	C_2-C_1/GDP_1	I_2-I_1/GDP_1	$(X-M)_2$-$(X-M)_1/GDP_1$	GDP_2-GDP_1/GDP_1
YR1961	1933300	2361300	826300	637400	1027000				
YR1962	1797500	2474900	1126200	661100	1038900	-0.06	0.13	-0.02	0.05
YR1963	1900100	2772500	1272400	796100	1038900	0.04	0.06	0.02	0.12
YR1964	1902000	2908500	1396700	919300	1126800	0.00	0.04	0.00	0.05
YR1965	2051100	2984200	1408900	966700	1198100	0.05	0.00	-0.03	0.03
YR1966	2087600	3087300	1389400	900400	1207600	0.01	-0.01	0.03	0.03
YR1967	2093800	3092300	1450400	935900	1286100	0.00	0.02	-0.02	0.00
YR1968	2149800	3414200	1428400	919300	1095900	0.02	-0.01	0.09	0.10
YR1969	2319400	3576300	1404000	940700	1119700	0.05	-0.01	0.00	0.05
YR1970	2641800	3743300	1362500	945300	1317000	0.09	-0.01	-0.03	0.05
YR1971	2795700	4138600	1424200	1041200	1437200	0.04	0.02	0.05	0.11
YR1972	3154700	4872900	1812800	1188800	1761600	0.09	0.09	0.00	0.18
YR1973	3560700	4841000	1505800	1197800	1741600	0.08	-0.06	-0.03	-0.01
YR1974	3715700	5231900	1858300	1411300	2087900	0.03	0.07	-0.02	0.08
YR1975	4303000	5606300	1838400	1762400	2293300	0.11	0.00	-0.04	0.07
YR1976	4515800	6047900	2028800	2014800	2554300	0.04	0.03	0.01	0.08
YR1977	4924000	6254200	2069900	2030900	2942500	0.07	0.01	-0.04	0.03
YR1978	5186400	6657000	2293500	2130500	3190300	0.04	0.04	-0.01	0.06
YR1979	5451900	7094200	2437300	2282300	3671000	0.04	0.02	0.00	0.07
YR1980	6119000	7620500	2460200	2372200	3836100	0.09	0.00	-0.02	0.07
YR1981	6568500	8040700	2830100	2709100	4335300	0.06	0.05	-0.05	0.06
YR1982	6793900	8001000	2810700	2930700	4374800	0.03	0.00	-0.03	0.00
YR1983	7106201	8375600	2749300	2793300	4276900	0.04	-0.01	0.02	0.05

Source: International Monetary Fund

Year	Final consumption expenditure (constant LCU, in thousands)	GDP (constant LCU, in thousands)	Gross capital formation (constant LCU, in thousands)	Imports of goods and services (constant LCU, in thousands)	Exports of goods and services (constant LCU, in thousands)	C_2-C_1/GDP_1	I_2-I_1/GDP_1	$(X-M)_2$-$(X-M)_1/GDP_1$	GDP_2-GDP_1/GDP_1
YR1984	7516000	8857100	2988300	2926000	4519700	0.05	0.03	-0.02	0.06
YR1985	7707800	9357400	2612100	2684500	3930000	0.02	-0.04	0.08	0.06
YR1986	7824900	9222000	2123700	2207000	3849200	0.01	-0.05	0.03	-0.01
YR1987	7929800	9840000	2086500	1984000	3716400	0.01	0.00	0.06	0.07
YR1988	8033000	9847100	1831300	1905100	4316500	0.01	-0.03	0.02	0.00
YR1989	8039500	10019100	2411800	2321000	4944600	0.00	0.06	-0.04	0.02
YR1990	8650200	10815600	2927600	2634700	5473200	0.06	0.05	-0.03	0.08
YR1991	8824601	11237900	2908800	2687400	5165100	0.02	0.00	0.02	0.04
YR1992	9358900	12115100	3484200	3180900	5772100	0.05	0.05	-0.02	0.08
YR1993	9692200	12380400	3404500	3305000	5930200	0.03	-0.01	0.00	0.02
YR1994	10004600	12773900	2969200	3338200	6119800	0.03	-0.04	0.04	0.03
YR1995	10305500	13074300	3118500	3112800	6348600	0.02	0.01	-0.01	0.02
YR1996	10732000	14008600	3459700	3181100	6135500	0.03	0.03	0.01	0.07
YR1997	11252400	14770800	3640800	3453800	6676700	0.04	0.01	0.00	0.05
YR1998	11843300	15477400	3845500	3653800	7055800	0.04	0.01	-0.01	0.05
YR1999	12481599	16414401	4035300	3964800	7269900	0.04	0.01	0.01	0.06
YR2000	13170000	17185100	4389300	4136800	7918300	0.04	0.02	-0.02	0.05
YR2001	13881900	18031401	4728700	4481100	8993400	0.04	0.02	-0.01	0.05
YR2002	14454500	18329600	4427600	4403600	8652000	0.03	-0.02	0.00	0.02
YR2003	15190500	19348799	4667000	4262700	8612600	0.04	0.01	0.00	0.06
YR2004	15987700	20517200	4713600	4266600	8917900	0.04	0.00	0.02	0.06
YR2005	16686500	21333201	4647700	4368100	9018000	0.03	0.00	0.01	0.04
YR2006	17409245	22540800	4909423	4608106	9144448	0.03	0.01	0.01	0.06
YR2007	18657042	23968201	5178988	4860948	9625411	0.06	0.01	0.00	0.06

Source: International Monetary Fund

Table 3

Year	Agricultural exports	Food exports	Fuel exports	Manufactures exports	Ores exports	Merchandise as % of GDP
YR1961						37.1
YR1962	5.1	63.5	0.0	8.5	22.8	37.8
YR1963	5.0	63.7	0.0	9.2	22.1	34.0
YR1964	4.8	61.7	0.1	9.3	24.0	36.8
YR1965	6.0	44.5	0.1	18.8	30.5	36.9
YR1966	5.8	48.4	6.4	13.2	26.2	37.5
YR1967	5.5	35.4	14.9	21.3	22.9	37.8
YR1968	5.6	33.1	19.9	20.5	20.9	30.9
YR1969	5.7	32.0	26.0	18.8	17.4	33.5
YR1970	4.7	29.9	27.2	19.1	19.0	33.9
YR1971	3.7	35.4	27.8	16.5	16.6	33.4
YR1972	2.8	43.3	27.1	15.1	11.6	34.9
YR1973	2.7	32.8	31.8	21.8	10.9	40.4
YR1974	1.9	24.8	35.9	22.4	15.0	57.8
YR1975	1.6	19.2	43.6	19.6	16.0	52.7
YR1976	1.8	19.9	42.4	25.7	10.2	51.4
YR1977	2.0	15.2	41.9	33.4	7.5	53.9
YR1978	2.1	15.7	38.5	38.0	5.7	54.7
YR1979	1.2	12.8	48.6	33.8	3.7	64.5
YR1980	0.9	7.2	52.5	35.7	3.6	65.6
YR1981	0.7	9.2	54.0	33.3	2.7	74.6
YR1982	0.9	8.7	45.9	41.4	2.9	66.5
YR1983	0.9	7.2	45.5	43.4	2.8	59.4
YR1984	0.7	10.2	44.3	41.9	2.7	60.2
YR1985	0.8	9.7	42.2	44.5	2.5	53.4
YR1986	0.7	12.2	24.3	59.8	2.5	51.6
YR1987	0.8	12.7	23.6	60.3	2.1	53.4
YR1988	0.9	12.3	16.1	67.6	2.6	60.3
YR1989	1.0	9.9	20.0	66.1	2.6	72.3
YR1990	1.0	11.0	17.3	69.1	1.6	73.5
YR1991	0.7	15.0	14.3	68.9	1.1	68.0
YR1992	0.6	10.1	15.1	72.9	1.3	67.4
YR1993	0.6	11.3	11.5	75.1	1.4	68.6
YR1994	0.6	12.8	9.5	75.8	1.3	71.9
YR1995	0.6	9.8	8.5	79.4	1.7	74.2
YR1996	0.7	7.3	10.5	79.8	1.6	67.5
YR1997	0.7	11.0	9.1	78.0	1.2	71.3
YR1998	0.6	9.5	6.4	82.3	1.2	71.1
YR1999	0.6	11.2	7.2	79.6	1.4	69.0
YR2000	0.7	8.7	12.1	77.0	1.5	74.1

Source: World Development Indicators

Year	Agricultural exports	Food exports	Fuel exports	Manufactures exports	Ores exports	Merchandise as % of GDP
YR2001	0.7	7.9	9.2	80.7	1.4	80.8
YR2002	0.7	6.8	9.4	81.3	1.4	77.9
YR2003	0.9	7.6	8.6	81.5	1.5	75.8
YR2004	0.7	11.1	9.6	77.6	1.1	80.0
YR2005	0.6	10.4	13.0	74.9	1.2	81.7
YR2006						85.2
YR2007						97.1

Source: World Development Indicators
All exports shown are as a percent of merchandise exports, except for merchandise trade, which is as a percent of GDP.

Table 4

Year	Agriculture and fishing as % of GDP	Mining as % GDP	Water as % of GDP (inc in mining)	Manufacturing as % of GDP	Textiles, clothing, and leather as % of GDP	Construction and public works as % of GDP	Services as % of GDP	Tourism as % of GDP
YR1982	13.1	1.1	11.9	11.1	2.9	6.4	43.7	3.8
YR1983	12.4	1.4	11.1	14.2	3.3	5.9	39.4	4.2
YR1984	14.2	1.1	11.9	14.8	3.3	5.6	39.5	4.0
YR1985	15.8	0.9	11.1	15.1	3.8	5.6	38.8	4.5
YR1986	13.0	1.0	9.2	15.8	4.1	4.5	43.7	4.9
YR1987	16.5	1.0	9.4	15.1	4.1	4.0	41.7	5.0
YR1988	11.8	1.2	8.7	16.8	4.4	3.9	44.9	5.7
YR1989	12.9	1.5	8.8	17.0	4.7	3.9	44.7	5.5
YR1990	15.7	0.9	7.9	16.9	5.1	4.1	43.1	5.1
YR1991	16.7	0.8	7.4	16.9	5.2	3.8	41.8	4.2
YR1992	16.1	0.6	6.8	16.5	5.4	4.4	42.1	5.2
YR1993	14.7	0.5	5.5	17.2	5.6	5.0	43.9	5.6
YR1994	12.6	0.5	5.2	18.5	6.2	5.0	45.2	6.0
YR1995	11.4	0.5	5.1	19.0	6.7	4.8	46.4	6.2
YR1996	13.7	0.7	5.0	18.3	6.6	4.4	45.2	6.0
YR1997	13.2	0.8	4.9	18.5	6.5	4.4	45.7	6.1
YR1998	12.7	0.9	4.4	18.5	6.6	4.6	45.8	6.2
YR1999	13.0	0.9	4.7	18.1	6.3	4.5	45.4	6.3
YR2000	12.4	0.9	4.8	18.2	6.3	4.7	45.6	6.1
YR2001	11.6	0.8	4.8	18.5	6.7	4.7	46.0	6.0
YR2002	10.3	0.8	4.9	18.6	6.6	5.2	47.2	5.7
YR2003	12.1	0.7	4.3	18.0	6.1	5.3	47.4	5.6
YR2004	12.4	0.6	4.5	17.7	5.6	5.4	47.5	5.7
YR2005	10.9	0.6	5.8	17.1	5.1	5.5	49.1	5.9
YR2006	10.8	0.6	6.2	17.1	4.6	5.4	49.2	5.8
YR2007	10.5	0.5	6.8	17.2	4.5	5.3	49.2	5.7
YR2008	9.9	0.5	7.3	16.9	4.3	5.6	49.7	5.5

Source: International Monetary Fund

Table 5

Year	LPF rate, female (%)	LFP female growth (%)	LFP rate, total (%)	LFP growth rate (%)
YR1980	19.8		51.7	
YR1981	19.9	0.5	51.5	-0.4
YR1982	20.2	1.5	51.4	-0.2
YR1983	20.4	1.0	51.2	-0.4
YR1984	20.5	0.5	51.0	-0.4
YR1985	20.7	1.0	50.8	-0.4
YR1986	21.0	1.4	50.7	-0.2
YR1987	21.1	0.5	50.6	-0.2
YR1988	21.4	1.4	50.5	-0.2
YR1989	21.7	1.4	50.3	-0.4
YR1990	22.1	1.8	50.5	0.4
YR1991	22.5	1.8	50.6	0.2
YR1992	23.0	2.2	50.7	0.2
YR1993	23.5	2.2	50.9	0.4
YR1994	24.0	2.1	51.0	0.2
YR1995	24.4	1.7	51.1	0.2
YR1996	24.9	2.0	51.2	0.2
YR1997	25.5	2.4	51.4	0.4
YR1998	26.2	2.7	51.8	0.8
YR1999	26.8	2.3	52.2	0.8
YR2000	27.4	2.2	52.6	0.8
YR2001	28.1	2.6	53.0	0.8
YR2002	28.8	2.5	53.5	0.9
YR2003	29.5	2.4	53.9	0.7
YR2004	30.4	3.1	54.3	0.7
YR2005	31.1	2.3	54.8	0.9
YR2006	31.9	2.6	55.2	0.7

Source: World Development Indicators

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