

Growth in a Macro Economic Context – How is Tanzania Doing?

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Numerous studies have attempted to identify the determinants of economic growth on a macro-economic level. We think the macro-level determinants of growth is a good starting point for the identification of investment opportunities. We will look at one strain of studies that uses a specific methodology – cross country regressions – to explain differences in economic growth between countries during the period of 1960-1990. We base ourselves on the work of Barro (1996), Barro and Lee (Collier and Gunning (1997), Easterly and Levine (1995, 1997) and Sachs and Warner (1997).

The framework:

The framework of analysis used here is the famous neo-classical growth model, as developed by Solow (1956). The original idea of the neo-classical growth model has two noteworthy properties. The first one is the so-called convergence property. It states that the lower the starting level of real per capita gross domestic product (GDP), the higher the predicted growth rate will be. The second prediction of the model is that per capita growth will eventually come to a halt. Both properties are driven by the assumption of diminishing returns to capital. Reality, however, shows that positive per capita growth rates do persist over centuries and do not have a tendency to decline. This problem was solved in a rather pragmatic way. The introduction of technological progress in an unexplained (exogenous) way made persistent growth possible, while retaining the convergence property.

Obviously, this model was insufficient if one was looking for the real determinants of long term economic growth. Endogenous growth theory thus emerged, trying to explain the missing link in neo-classical growth models. A large body of literature emerged trying to incorporate a theory of technical progress into growth models. First, researchers experimented with ideas which were unintended by-products of production or investment, a process known as learning by doing (Romer (1986), Lucas (1988) and Rebelo (1991)). Later, theories of purposive Research and Development were developed (for example, Romer (1990), Aghion and Howitt (1992) and Grossman and Helpman (1991)). Although in a different way, both these theories were consistent with positive growth rates in the long run². Note that these endogenous growth theories renewed interest in the role of the government in GDP growth, through enabling a climate favourable to R&D (taxation, infrastructure, protection of intellectual property rights, education,...).

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² In the learning by doing literature, economies can continue to grow because investment in capital goods now not necessarily diminishes as economies grow (through spillover effects from knowledge). In the R&D literature, growth can remain positive as long as there are new ideas.

Endogenous growth models are important to explain long run growth. But recent cross country empirical studies are more concerned in explaining relative differences in growth rates. For these strain of studies, the neo-classical growth model, augmented with human capital, government policies and the diffusion of technology, remains the preferred framework. In equation form, a useful representation is as follows:

$$\Delta y = f(y, y^*)$$

Here, Δy is the growth rate of output per capita, y is the current level of output per capita, and y^* is the long-run steady-state level of output per capita. y^* in its turn depends on an array of choice and environmental variables. The private sector's choices include savings and investment rates, labour supply and fertility rates and demand for education and health services. The government's choices involve spending in various categories (non productive consumption, spending on education and spending on health), tax rates, the extent of distortions of markets and business decisions (for example openness to trade), maintenance of the rule of law and property rights (social capital). For the environmental variables, the terms of trade will also prove to be an important determinant of the long-run steady-state in small and developing countries. Other geographical environmental variables that are important are easy access to international markets, climatic conditions and natural resource endowments.

In the neo-classical framework, initial per capita income (y) will have a negative effect on the growth rate (Δy). This is what is understood with the convergence principle. The higher the initial level of per capita income, the lower the per capita growth rate. The long-run steady-state level of output per capita (y^*), on the other hand, will have a positive effect on the per capita growth rate. If one of the determinants of y^* changes, inducing a change in y^* , this will translate into a transitional change in the growth rate of an economy. For example, given a fixed initial y , if the government chooses to improve the climate for business activity (by reducing the burdens of taxation, regulation and corruption and enhancing property rights), the growth rate will increase for a while, until y has reached the point where diminishing returns eventually restore the growth rate to the value determined by technological progress.

The macro economic determinants of growth:

In order to advise in which sectors the government should invest, we would like to have some idea about the importance of each of the determinants of economic growth. In the next section, we will explain how each determinant influences economic growth. We will further look at how Tanzania is doing on each determinant, compared to other countries.

Initial level of GDP:

As already stated above, the initial level of per capita GDP has a 'negative influence' on the long term growth rate of an economy. This property, called the convergence property, is driven by diminishing returns to (a broad concept of) capital. If a country starts of with a relatively low level of per capita GDP, it can enjoy high growth over an extended period before diminishing returns start to kick in. This is of course conditional

on the long run steady state value of per capita GDP (y^*). The initial level of GDP per capita reflects endowments of physical capital and natural resources (and also depends on effort and the unobservable level of technology) (Barro (1996)).

For the case of Tanzania, the latest data we have are from 2000. Ordering from the lowest GDP per capita to the highest, Tanzania comes on the 6th place. Only Ethiopia, Burundi, Sierra Leone, Eritrea and Malawi do worse. To get a feel of the relative difference in per capita GDP, we take a look at the distribution of per capita GDP over the different countries. Tanzania earns 0.0166 percent of world GDP per capita. The poorest 10 countries have a cumulative share of only 0.15 percent, while the richest 10 countries have a cumulative share of 33.5 percent of world GDP per capita.

Can we say something about the magnitude of this effect? Different authors have estimated this effect, but comparisons are hard to make, because the authors use different definitions (GDP per capita vs. GDP per economically active population). Both Barro and Sachs and Warner find support for the convergence property, and estimate a negative coefficient for the (log of) initial GDP per capita or economically active population. Easterly and Levine argue that the convergence result is generally non linear: they find that the catch up effect is rather weak for low income countries. They calculate that the catch up effect on GDP growth is highest for countries around 1600 USD (in prices of 1991), which are the average income countries.

Savings and Investment

In the neo-classical growth model for a closed economy, the savings rate is exogenous and equal to the investment ratio to output. A higher savings/investment rate raises the steady-state level of output (y^*) per effective worker and therefore the growth rate for a given starting level of GDP (y). There has been some empirical evidence of a positive effect of savings and investment on growth. But some have argued that these results are suffering from endogeneity. When using current investment, couldn't it be that high growth triggers investment, instead of investment causing high growth?

Being a high risk environment, it can be expected that Africa might have a high demand for the services of financial markets. Despite this fact, savings rates are very low in Africa. The primary cause is the lack of financial institutions for the majority of its people. This lack of savings and credit facilities (both formal and informal) is in its turn the result of different reasons. To quote just a few, there is the financial repression in the past, the lack of suitable collateral, poor performance of the legal system in case of repayment default, bad infrastructure...

Looking at the data for Tanzania, the first natural candidate is gross domestic savings. Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption). For 2000, out of a list of 150 countries, Tanzania has the 46th lowest Gross Domestic Savings as a percentage of GDP, namely 9%. Overall, it ranges from –32 in Eritrea to 74 in Equatorial Guinea. Most European countries save around 20 percent of their GDP. A related measure is gross national savings including net current transfers is equal to gross domestic savings plus net income and net current transfers from

abroad. On this measure, Tanzania has a share of 14 percent and ranks 47th lowest. The lowest for this measure is -1, shared by Malawi and Angola. Singapore has the highest with 55%.

We supplement the savings data with data on Foreign Direct Investment (FDI) as a percentage of GDP. Out of 160 economies, Tanzania ranks the 67th lowest with a 2.14 % share of GDP coming in as foreign direct investment. Ireland is amongst the highest, with a share of 24.27 percent. Indonesia, Swaziland and Yemen have negative foreign direct investment of about -2 percent of GDP.

The lack of financial deepening can be gauged by Money and quasi money (M2) as a percentage of GDP. Money and quasi money (M2) comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government. It provides an indication of how well the financial sector is developed in an economy, and gives us a feel of the importance of one of the possible reasons for the low savings rates in Tanzania.

For Tanzania, the M2/GDP ratio is equal to 18.1% and is the 30th lowest in a list of 150 countries. The lowest M2/GDP ratios are reported for Equatorial Guinea (4.35%) and Belgium (5.88%). Countries with the highest include Hong Kong (226.73%), Lebanon (189.21%), Switzerland (144.21%) and China (143.73%) and Japan (120.02%).

Similar data is the domestic credit to the private sector. It refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. Out of 158 countries, Tanzania ranks the 10th lowest, with only 4.61 percent of GDP domestic credit to the private sector. Japan is the highest in the sample with a share of 187 in 2000.

Population Growth

There are two reasons why population growth may influence growth in a negative way. First, population growth reduces the long term steady state level of GDP per capita y^* , because a portion of the economy's investment gets used to provide these new persons with capital, rather than raise capital per worker. The second reason is that child care draws away time that can not be used for production. Note that Sachs and Warner use a slightly different measure to capture the effects of population growth, namely the difference between the growth rate of the working age population (between 15 and 65) and the growth rate of the whole population. Hence they expect and estimate a positive effect on growth for their measure.

Population growth get proxied by the total fertility rate. Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with prevailing age-specific fertility rates. In 2002, the fertility rate for Tanzania is 5.3. Out of 191 economies, Tanzania has the 28th highest total fertility rate. Nigeria and Somalia have the highest rates, more than

7 children. Hong Kong has the lowest: one child. We also computed the measure used in Sach and Warner, namely the difference between the growth rate of the working age population (between 15 and 65) and the growth rate of the whole population. From 1976 onward, Tanzania's working population has been growing faster than the whole population. For the most recent year we have data on, 2000, Tanzania's working population is growing 0.6 percent faster than total population. Out of a list of 180 countries, Tanzania has the 78th highest difference between working age population and total population. Croatia has the lowest, with total population growing 1.41 percent faster than working age population. In Kuwait and Rwanda, the working age population is growing almost 5 percent faster than total population.

Initial Level of Human Capital

The original neo-classical growth models tried to explain growth in income using only three exogenous variables: the savings rate, the rate of population growth and technology. In their famous 1992 article, Mankiw, Romer and Weil argue that, although the Solow model rightly predict the direction of the effects of savings and population growth on GDP growth, the magnitude seems too large. They augment the model by including the accumulation of human capital as well and find that this decreases the coefficients on savings and population growth, while dramatically improving explanatory power. Hence, the inclusion of some measure(s) of human capital accumulation became standard practice.

A first measure of human capital that is included in most cross country growth studies is (the log of) life expectancy³. Life expectancy is included as a summary measure of sickness and disease. It is argued that poor health reduces labour productivity. The relationship appears to be quadratic, with stronger positive effects when changes occur at low levels than at high levels of life expectancy. The reason for this is that at low levels, changes in life expectancy reflect basic improvements in public health and eradication of diseases. This is thought to have a large effect on economy wide efficiency and growth. Changes in life expectancy at higher levels tend to reflect increases in old-age survival rates, affecting economically inactive people, and therefore there will be less economic impact.

Having data from almost 200 countries in 2000, Tanzania has a life expectancy at birth of 44.35 years and ranks as the 16th lowest. Life expectancy was highest in 1987, at 51 years, but has been falling continuously due to the impact of HIV/AIDS. The pandemic brought Tanzania back to its 1967 level. Life expectancy is lowest in Zambia, just under 40 years, and highest in Japan at almost 80 years.

A second aspect of human capital is education. It is widely acknowledged that education has positive effects on growth. These effects are both direct, as well as indirect (higher education for women increases life expectancy. Since life expectancy is correlated with higher economic growth, education indirectly influences growth).

³ Life expectancy can also be classified under social capital, as it will reflect the quality of public health institution.

Despite the fact that theory predicts large growth effects from education, macro-economic cross country growth regressions only find secondary education to be significant. Primary education is insignificant, but Barro notes that primary education nevertheless is indirectly growth enhancing, because it is a prerequisite to secondary education. Easterly and Levine and Collier and Gunning also find a positive coefficient for secondary school enrolment. A more surprising feature shows up in Barro's regression. Differentiating between male and female secondary education, he finds no correlation between female secondary schooling and economic growth. This contradicts with the importance of female education witnessed on the micro-economic level, and stressed by influential economists like Amartya Sen. Barro notes that female education is correlated with other indicators of development, like lower infant mortality (thus increasing life expectancy), lower fertility rates and political freedom. Those variables are already controlled for in the regression, hence the insignificance of female education.

A first measure of education in Tanzania is the adult illiteracy rate. It is the percentage of people ages 15 and above who cannot, with understanding, read and write a short, simple statement on their everyday life. For 2000, out of 133 countries, Tanzania has the 47th highest illiteracy rate, with one quarter of the population illiterate, of which women make up more than two thirds. A second measure is the Net intake rate in grade 1. It is the number of new entrants in the first grade of primary education who are of official primary school entrance age, expressed as a percentage of the population of the corresponding age. For Tanzania, having a policy of universal primary education, this figure is surprisingly low: only 11.85 percent in 1998. The pupil-teacher ratio in primary education is a good measure for the quality of education. In Tanzania, there are just over 36 pupils per teacher. Out of a list of 188 countries, Tanzania ranks the 38th highest. The Central African Republic has the highest ratio, with more than 88 pupils per teacher. Most high income countries have a ratio of around 15. We took averages over the 90's to avoid missing variables.

Enrolment rates⁴ are frequently used in cross country regressions, because of their availability. For Tanzania, primary net enrolment in 1998 is 48.7 percent. In a list of 138 countries, Tanzania ranks the 15th lowest. For secondary education, Tanzania has 3.9 percent in 1998. From the 117 countries we have data for, Tanzania ranks as the poorest performing country. For tertiary education, we only have data on the gross enrolment rate. Tanzania has a value of 0.66% in 1998. Out of 172 countries, here Tanzania comes on the 7th lowest enrolment. Canada, the United States and Australia score highest. Tanzania spent 2.12% of its GDP on education in 1998. Out of a list of 155 countries, Tanzania spends the 16th lowest share of its GDP.

⁴ Gross Enrolment is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Net enrolment, on the other hand, is the ratio of the number of children of official school age (as defined by the national education system) who are enrolled in school to the population of the corresponding official school age. Thus, for the case of regression analysis, we argue that net enrolment rates are better suited. The reason is that high gross enrolment rates (more than 100%) reflect a high number of repetition, possibly due to low quality. These high rates are then associated with lower growth. Note that this is not the case for net enrolment rates.

Openness to trade

There are a variety of reasons why openness to trade might affect the steady state level of income. Openness to trade is thought to encourage greater efficiency in the allocation of the economy's scarce resources. It also promotes competition, thereby reducing possible monopolies and increasing quality and customer care. It may also encourage the importation of technological innovations and improvements, raising total factor productivity in the entire economy. One might also argue that openness to trade encourages international factor mobility, especially in the form of financial and physical capital. As long as capital flows from regions where it is abundant to regions where it is scarce, it will promote convergence of the capital/labour ratio.

Out of a list of almost 100 economies (the European Union has a uniform trade policy), Tanzania ranks 25th highest with an average import tariff of just under 18 percent. The European Union has an average tariff of 2.4 percent, the United States of 4 percent. Pakistan and Morocco are the champions with respectively 46.6 and 33.6 percent. The spread around the average tariff gives us an idea of how uniform the trade regime is taxed. Some countries might have relatively low average tariffs, but apply high tariffs to protect some favoured domestic industries. Tanzania seems to have a rather uniform tariff system, ranking 52nd highest if we look at the standard deviation of the tariffs. The United States rank 38th highest with a standard deviation of 10.7 percent, suggesting the U.S. is protecting a few industries (like the ailing US steel industry) very hard.

In accordance with these data, almost all authors of macro-economic cross country growth studies find that Africa has become less open than any other region by 1980 (Collier and Gunning (1998)). On one measure not only was Africa the area with the highest trade restrictions, but the gap between it and the next most restrictive area, the Middle East, was wider than that between the Middle East and the most liberalised region, the Far East (Dollar (1992)). Sachs and Warner (1995, 1997) use a binary measure and find that almost all African economies were closed whereas 37% of other developing countries were open. Easterly and Levine (1997) use the parallel premium as their measure of openness and come to the same conclusion. Furthermore, the authors conclude that lack of openness has had a significant effect on the growth of African economies. Or, as Collier and Gunning (1998) put it: "openness explains why Africa has grown more slowly than other regions both because openness is important for growth while Africa has been much less open than other regions, and because a given level of trade restrictions has been more damaging in Africa than elsewhere, because it has been in the context of much smaller economies."

These figures should be looked at with care. First of all, the data do not take into account nontariff measures. Nontariff barriers, which limit the quantity of imports of a particular good, take many forms. Some common ones are quotas, prohibitions, licensing schemes, export restraint arrangements, and health and quarantine measures. Developing countries, like Tanzania, are likely to suffer from stringent quality standards imposed by

Western countries⁵. Furthermore, these figures do not take into account the production subsidies. It is well known that Western countries heavily subsidise their agricultural industry. For example, it is estimated that in the EU, 40 % of farm income comes from subsidies (Oxfam (2002)).

Issues like this have been raised by influential economists like Dasgupta and Stiglitz. Social movements recently emerged to protest against World Trade Organisation summits. They all agree that the multilateral international organisations have pushed economic liberalisation without taking into consideration the adverse effects on the poorest in developing countries. They say these organisations use double standards: while developing countries should abolish all their trade barriers, Western Countries increase their barriers in sectors like steel production and agriculture (sectors where African countries are thought to have a comparative advantage in) thus hurting the poor even more. The high indebtedness and aid dependence of African countries also makes them vulnerable to outside influence.

All this resulted in a fear for globalisation. Institutions like the World Bank and the World Trade Organisations have shown us the downside of global capitalism: the rich and powerful become richer and the poor become more dependent and exploited. Sadly, activists and NGO's these days have turned away from globalisation. They think international trade is invariably bad for developing countries, and want to reinstall various trade regulations. This is sad, because, although economists do have differing opinions on the World Bank policies, very few will claim Ricardo was wrong. The fastest and easiest way to grow is through fair trade.

Social Capital

Social capital has become a widely discussed topic these days, especially in development economics. It has become so important it even gave rise to a new branch in economics, denoted as institutional economics. It is concerned about the economic aspects of the institutions in societies⁶. Collier and Gunning (1999) make a distinction between civic social capital on the one hand and public social capital on the other hand. In this part of the study, we are interested in their concept of public social capital. These are the institutions of government that facilitate private activity such, as the courts. Civic social capital, on the other hand, are the economic benefits that accrue from social interactions on a more micro-economic level. These benefits can arrive from the building of trust, which lowers transaction costs, from the knowledge externalities of social networks, and from enhanced capacity from collective action. We will discuss civic social capital in the micro-economic part of the study.

Quantifying the quality of public social capital is hard. Keefer and Knack (1994) and Barro (1996) use an index of institutional quality. It is an average of 5 sub-indexes. The *rule of law index* "reflects the degree to which the citizens of a country are willing to

⁵ For example, Tanzanian cotton exports to the United States qualified for a preferential treatment in the AGOA (African Growth and Opportunity Act) initiative. However, the benefits for small scale cotton producers have been limited due to high quality requirements.

⁶ For a nice introduction on the topic, see Platteau (2000).

accept the established institutions to make and implement laws and adjudicate disputes". The *bureaucratic quality index* measures "autonomy from political pressure", and "strength and expertise to govern without drastic changes in policy or interruptions in government services." The *corruption in government index* measures whether "illegal payments are generally expected throughout the government", in the form of "bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans." The *risk of expropriation index* measures high risk of "outright confiscation" or "forced nationalisation." The *government repudiation of contracts index* measures the "risk of a modification in a contract taking the form of a repudiation, postponement or scaling down". These 5 indices are gathered and published in the International Country Risk Guide, by the Political Risk Services⁷.

Unfortunately, we do not have recent information on this indicator. We do have related data that gives us an idea about how potential investors view risk: The Political Risk Services Group's International Country Risk Guide (ICRG). This index collects information on 22 components of risk, groups it into three major categories (political, financial, and economic), and converts it into a single numerical risk assessment ranging from 0 to 100. Ratings below 50 indicate very high risk, and those above 80 very low risk. We do admit that this indicator is thus broader than what we are looking for.

Out of a list of 129 countries included in the ICRG study, Tanzania has the 22 lowest value (or the 22th highest risk) with a value of 57.5. Zimbabwe is deemed most risky with a value of 39. The countries that are the least risky are Norway (92.3) and Singapore (89.3).

Why is Africa short on social capital? Easterly and Levine (1997) bring forth the hypothesis that the high degree of ethnic fractionalisation in Africa might explain the poor quality of public social capital.

Tanzania has more than 120 different ethnic groups. The largest ethnic group, the Sukuma, represents 'only' 13 percent of the total population. To quantify the idea of ethno-linguistic fractionalisation, anthropologists have constructed an index. It is the probability of two randomly drawn citizens being from different ethno-linguistic groups. For Tanzania, this measure is as high as 93 percent, the highest in the sample. But is ethnic fractionalisation really a problem for Tanzanian institutions?

We think it is not. Collier (1998) argues that diversity has no detrimental effects in countries with full democratic rights. Indeed, ethno-linguistic fractionalisation influences growth in as much as it is reflected in governance and policy. Furthermore, there are at least two reasons why fractionalisation is less problematic in Tanzania than in other African economies. The first is that Tanzania has its own national language, Kiswahili, that is spoken by almost all groups and creates a special feel of unity. The second factor is the

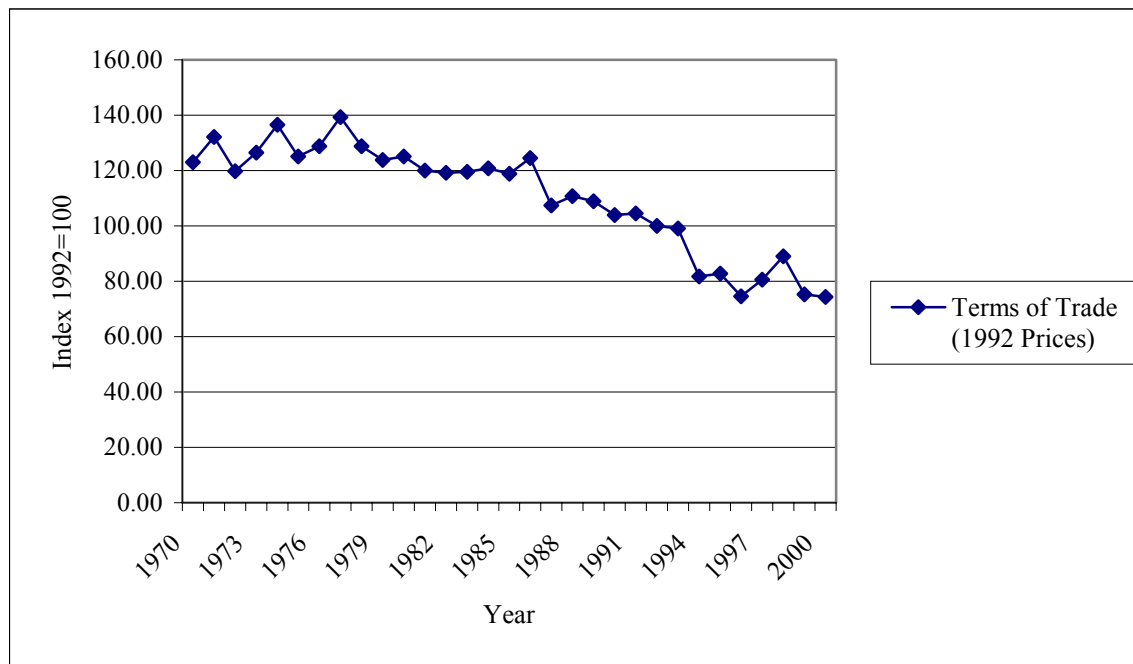
⁷ One can indeed argue that this index is rather subjective and thus not very useful for explaining the direct effect on growth. Still, this index is published by a reputable institute and bought by firms to evaluate their return on investment. In as far as this index influences the decision to invest in a particular economy, the index will influence economic growth in that economy.

Ijumaa policy of the late president Julius Nyerere. This policy mixed people throughout the country. As a result, Tanzanians are used to work with people of different ethnolinguistic groups. Indeed, in Tanzania, the unusual high ethnic fractionalisation might be a strength for democracy, avoiding tribe biased policies and parties that use ethnic majority to come to power.

The Terms of Trade

A deterioration of the terms of trade (defined as the ratio of export to import prices) of developing countries is frequently quoted as the cause of persistent slow or even negative growth. Most of the developing countries indeed specialise their exports in a few primary commodities. But there is only a relationship between changes in the terms of trade and economic growth in as far as these changes stimulate shifts in domestic employment and output. For example, an oil-importing country might react to an increase in the relative price of oil by cutting its employment and production. Barro finds a significant positive effect of changes in the terms of trade. It seems that an improvement of the terms of trade indeed stimulates an expansion of real GDP.

Comparative data on the terms of trade is not immediately available. We thus limit ourselves to the evolution of the terms of trade for Tanzania. From 1970 till 1986, the terms of trade for Tanzania remained relatively stable. But after 1986, the terms of trade has been declining dramatically. Over the last 15 years, the terms of trade has declined more than 40 percent. This is illustrated in the following graph:



Source: Globalisation and Tanzania, Van Arkadie, B. (2002)

Inflation

During the 90's many central banks have placed increased emphasis on price stability. Central bankers and other observers think that inflation is costly. Some of these costs

involve the average rate of inflation, while others relate to the variability and uncertainty that goes with inflation. Reviewing everything that has been written on the why's and how's of inflation and growth is beyond the scope of this paper. We will just argue that Barro found a negative correlation between inflation and per capita GDP growth. But closer inspection leads him to conclude that the relation is not linear. The negative effect is strongest in the high inflation region, in excess of about 20%.

The preferred measure of inflation is the consumer price index. For Tanzania, this index has been declining from 1994 onward. In 2000, it stood at a reasonable 6 percent. Out of a list of 138 countries, it had the 34th highest inflation.

Natural Resources:

In the Sachs and Warner (1997b) study, a measure of natural resource dependency of the economy is also included and appears to have significant explanatory power. Up to date, the debate is still raging whether natural resources are a curse or a blessing for an economy. There are different reasons why natural resource abundance might affect growth in developing countries. For an overview of possible negative effects of natural resource abundance on macro-economic performance, see Van Camphenout (2002).

The problem in evaluating the effects of natural resource intensity on growth empirically is in deciding what measure to use. Sachs and Warner use the ratio of primary-product exports to GDP as their preferred measure to proxy natural resource intensity. Indeed, they are a bit obscure on what it is exactly. They report a figure of 17 % for their measure for the year 1970 for Tanzania, which is the 32 highest out of a list of 110 countries. This seems a very high value, leading us to expect that food exports, which make up the largest share in exports, was included in their definition of natural resource intensity⁸. Stijns (2001) uses data on mineral and energy reserves and concludes that there seems to be no structural effect on growth if he uses this measure.

Looking into Tanzania's near future, the largest growth is expected to take place in the area of gold mining. In the wake of the government's efforts to attract foreign investment in the sector, several mines have (re)opened during 2000/2001, and up to 1,5 billion US has been invested in exploration and mine development from 1995 to date. In 1999, the largest share of foreign direct investment, 67 %, went to the mining and quarrying sector. While the average share of minerals in exports during the 90's stood at less than 10 percent, this figure had risen to 45 percent in September 2001. The government aims at a sector contribution of more than 10 percent to GDP by 2025.

Other

Under this heading, we put three more explanatory variables that are used in the regressions. The first is *social disturbance*. This variable is included in three out of the four regressions, but is measured by a different variable in each study. In one study,

⁸ The highest value for the ratio of exports of goods and services to GDP for Tanzania we have data on is in 1995 with a value of just over 20%. This includes commercial service exports as well (transport, insurance,...). Furthermore, food exports has the highest share in merchandise exports leading us to believe food exports is part of Sachs and Warner's measure.

social disturbance is proxied by the number of revolutions. Another study uses the number of assassinations, while the last study uses the months of civil war. For Tanzania, social disturbance is probably a minor issue.

Another measure that seems important in explaining growth in one of the studies is the countries geography. It is thought that countries that are geographically isolated from world markets face higher costs for all international activities, and may end up with lower division of labour and lower per capita output. *Landlocked* countries have a clear disadvantage, since they have to use road transport across at least one border in addition to the sea freight costs. Air transport is an alternative, but only certain goods (high value low volume) can be transported economically in this way. Tanzania is not land locked and has several ports.

Another measure of geography that is included in one of the studies is *the proportion of the population in tropical climates*. The authors quote two channels for a negative relationship: First, tropical countries face a wide variety of parasitic diseases that are much less prevalent in the temperate zones, and disease is one of the sources of low labour productivity. Second, soils tend to be more fragile, rains less reliable, pests and veterinary disease more prevalent, and natural disasters more frequent, all of which impede sustained agricultural growth in the tropics. Tanzania has considerable parts of its area in tropical zones.

Conclusion:

Tanzania is still one of the poorest economies in the world. Starting off with the 6th lowest per capita income in the world, there is ample space to increase productivity before diminishing returns to capital become an issue. Furthermore, relative to its closest neighbours in terms of initial capital (Ethiopia, Burundi, Sierra Leone, Eritrea,...), it is fair to say that the determinants of the long-run steady-state level of output per capita are more favourable for Tanzania. In short, if the neo-classical growth model is a valid representation of reality, Tanzania will enjoy a high transitional growth rate over the next few decades. But as Easter and Levine (1997) argue, due to non-linearities, this effect might be less important for low income countries.

Savings and investment influence raises the steady-state level of output (y^*) per effective worker and therefore the growth rate for a given starting level of GDP (y). Savings rates are low in Tanzania relative to the world, but not relative to Sub Saharan Africa. We do find that there is almost no domestic credit to the private sector. This appears to be a first challenge for the government. Possible reasons for the lack of domestic credit to the private sector are a lack of financial institutions in rural area's.⁹ Banks are also afraid to give credit to the private sector if there is no legal framework that permits them to reclaim their money in case of non repayment (lack of social capital).

⁹ Recent financial liberalisation increased competition and improved service provision (for some) in Dar es Salaam, Arusha and Mwanza, but outreach has been reduced by the closing of 75 NBC branches and the end of its mobile bank services (Wagwe, Hobbs and Lawuo (2002)). The government has responded to this problem by designing a legal framework for savings and credit associations (SACCO's) and community banks.

Research suggests that population growth has a negative effect on economic growth. Although population growth is quite high in Tanzania, our calculations suggest that from mid 70's, working age population has been growing faster than the total population. This will have a positive effect on the growth rate of Tanzania. However, given the data on the evolution of life expectancy in the next paragraph, we suspect the high prevalence of HIV/AIDS in Tanzania will reduce the growth of the working age population dramatically. Family planning, combined with an immigration policy designed to attract economically active foreigners might increase the active population/total population ratio.

Life expectancy in Tanzania is very low. It has fallen since 1987 due to the HIV/AIDS epidemic. As said above, life expectancy reflects sickness and disease, affecting labour productivity. The relation to GDP per capita growth is quadratic, and higher for countries with low life expectancy. It seems that there are still a lot of killer diseases. It also shows that the efforts of reducing the impact of HIV/AIDS are far from sufficient. Basic health provision to the rural poor will make a real difference in this case.

For education, Tanzania still is a long way from their target of universal primary education. Efforts should be directed at secondary education for two reasons: growth regressions point out to the importance of secondary education on growth and Tanzania has the lowest net secondary school enrolment in our data set. But a natural precondition for secondary education is primary education. More research should identify the reason for the low enrolment rates in secondary education. Is it just cost related (both direct cost and taking into account opportunity costs), or does it also have to do with a lack of quality in education (no adapted curricula, teachers that are not motivated, English as the language of instruction from secondary school onward). Tanzania spends relatively little on education and has a large number of pupils per teacher, affecting the quality in education.

Openness to trade improves efficient resource allocation, promotes competition and facilitates dissemination of know how. Using data on tariffs, Tanzania has rather high tariffs, but gauged by the standard error of the tariffs, it seems Tanzania has a rather uniform system. The data along with the regressions suggest that Tanzania could win if it further liberalised its trade. Trade openness is deemed the most important determinant of economic growth by all authors. However, it is known that trade liberalisation involves important costs in equity. This can be especially dangerous in an economy where large populations are dependent on the same activity for their subsistence. Furthermore, as mentioned above, measuring openness to trade is a tricky issue, since trade openness is influenced by much more than just tariffs. We argue that Tanzania can indeed win by further opening up their markets, but this should be done with appropriate safety nets in place for the affected parties. Furthermore, Tanzania should urge other countries to open up their markets just as well.

Social capital is a relatively new concept in economics, but it's importance for economic growth has already been established. In this macro-economic part of our study, we are mainly concerned with public social capital. Good public social capital is probably best

described by the popular term “good governance”. Measuring good governance is hard. On our (imperfect) measure, Tanzania does not very well. Also, if one follows the current debate in Tanzania, one gets the impression of low quality public social capital. On the other hand, Tanzania has freedom of press and a multi party system.

The terms of trade can influence growth only if the underlying economic structure changes in response to these price movements. Barro (1996) finds that, indeed, the terms of trade seems to have an effect on the economy. For Tanzania, the terms of trade has been worsening from 1986 onwards. But given the structure of Tanzanian exports, it seems unlikely that the worsening terms of trade is much of an issue. Tanzanian exports are primarily made up of food products. Since these food products are produced by subsistence farmers, we do not think there is a large response from the producers to changes in prices. Note that this is probably different for cash crops purposely cultivated for the foreign market like coffee and tea.

Good monetary policy resulted in a reasonable inflation rate in Tanzania.

Tanzania still relies heavily on natural resources. With the huge investments made in the gold mining sector recently, it is expected that the share of primary exports will dramatically increase in the near future. Given the fact that there is no agreement on the influence of natural resources on economic growth, we are not in a position to say if this should be encouraged or not. Still, there are some issues that can be learned out of the literature. First of all, the primary commodity that will become important for Tanzania is gold. Gold has a relatively stable price in comparison to other primary commodities like coffee and tea.

On the geographical determinants of long term economic growth, it is worth noting that Tanzania is not landlocked (influencing growth positively), but has substantial parts in tropical zones (influencing growth negatively).

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