MACROECONOMICS 201
Spring 2020
NOTES 13

ECONOMIC GROWTH

Reading Assignment:

Principles of Economics: Chapters 20, 32

Introduction

Why is the size of the economy and economic growth important?

- GDP (both real and nominal) and economic growth are used as a rough measure of how well off we are as a country - it is assumed that economic growth is roughly reflected in rising average living standards;(although perhaps not for everyone, particularly not recently);
- GDP and economic growth are a measures of our ability to deal with the many problems and catastrophes which affect the country, such as recessions, military conflicts, hurricanes, etc. (consider the difference between the U.S. and Liberia in their ability to deal with Ebola);
- GDP and economic growth are used as a rough measures of the strength and prestige of one country ***vis a vis*** other countries;
- GDP and economic growth are ***very rough*** measures of progress in reducing poverty.

1. How should we measure economic growth?

It is clear that in the U.S., the economy has grown steadily since WWII at rates which are unprecedented in the long sweep of history. Column one shows how it has increased since 1945 measured in current, i.e. ***nominal*** dollars. This makes good newspaper reporting and political propaganda. The average growth rate of nominal GDP was 6.18% between 1945 and 2018, which is actually a high rate of growth. It has slowed down significantly in recent years.

Year	Nominal GDP Billions of current dollars)	Real GDP (Billions of 2012 chained dollars)	GDP Per Capita (current dollars)	Real GDP Per Capita (2012 chained Dollars)
1945	$228.2	$2,328.6		
2017	$19,519 .4	$18,108.1		
2018	$20,580.2	$18,638.2		
1947 Q2			$1718	$14195
2019 Q2			$64837	$57794

2. Is nominal economic growth a good measure of economic growth?

No. As we have learned, GDP rises because of increases in ***both*** real output and inflation. Column two shows the rate of growth of GDP ***corrected for inflation, an estimate of the growth of real GDP, measured in constant (2012) dollars (chained).*** Changes in ***real*** output didn't always increase from year to year. However, the long run trend was clearly upward, and significantly so, with occasional bumps due to recessions. The average growth rate in ***real terms*** has been about 2.9% per year since 1945. GDP measured in real terms is a reasonably good measure of prestige, potential military prowess, and ability of a country to deal with problems.

Remember that these real GDP measures are really an estimate of the number of whatchamacallits and gadgets and other goods and services produced over time and contain significant biases. Note also that these measures of real output use a chained approach to adjust for price change. If you look up earlier tables which used the base year method rather than the chain index method, the year to year differences in estimated real growth are sometimes significant.

3. Are increases in real GDP a good measure of improving living standards?

Not really. Real GDP rises not only because of increasing output, but also because of increases in the work force. One (and an imperfect) way to measure the ***potential*** improvement in peoples' well-being because of rising GDP is to measure the increase in ***real* GDP *per capita***. This is shown in the fourth column in the above table. Although the trend in real GDP per capita has clearly been upward over time, there have been many ups and downs over the years. Real per capita GDP in the U.S. increased almost 2% per year between 1947 and 2017, which is a rough measure of how much each person could ***potentially*** see his or her consumption (well being?) increase each year. This increase is much lower than most annual wage adjustments, at least prior to 2009 contributing to inflation. At growth rate of 2% per year in real terms, it takes about 35 years to double one's standard of living, in ***real terms***. Think about that.

Even changes in real GDP per capita have significant problems as a measure of changes in per capita economic well-being:

- First, we have been importing considerably more than we are exporting, by about 3.0% (in 2018), a situation that will not last indefinitely. Actually, we are living above our ability to produce by running up debt to other countries. This why we owe so much of our national debt to other countries.

- Equally important, a significant part of our increasing ***output per capita*** is due to the rapid rise in the percentage of women in the labor force. One has to assume that this has resulted in **less** homemaking services provided, including home child care. At least part of the rising GDP must be devoted to *purchasing* child care and assistance in home care, which was previously provided without being included in GDP.

- It is important to emphasize that measures of changes in real per capita GDP almost certainly do not capture the extent to which technical change improves the **quality** of the lives of people. For example, computers and the internet have immensely improved your ability to access data, to prepare and edit documents (when I was in school, even a few corrections in a paper meant an all night vigil retyping the paper), accessibility to music and videos, etc.

- Part of our increasing income per person has been used to purchase leisure, e.g., longer vacations, more sick leave, more holidays. In the data, this shows up as a lower per capita increase in earnings, but does not capture the real improvement in the quality of lives of many people.

- Additionally, and this will concern some more than others, our increasing per capita GDP has not benefitted all equally. Personal income is distributed ***extremely*** unevenly in the U.S., with the wealthy receiving a large and growing percentage of U.S. GDP. A small number of people in the U.S. make incredible amounts of income, in some cases over $1 billion per year. There are different, and sometimes conflicting estimates of how much the top 1% of the population makes. According to one estimate, the top 1% of income earners in the U.S. received approximately18% of the pre-tax income in 2017, about double the share the top 1% received around 40 years ago. (Data on income distribution differ strikingly from study to study, depending on the source of data used, and many assumptions involved in making these estimates). An even smaller group, the the top 0.1% (one tenth of one percent) of U.S, households received approximately 10% of the pre-tax income in 2013, almost three times the share they received 40 to 50 years earlier.

- As noted in notes 5, there are numerous other problems in measuring GDP, particularly if it is being used as a proxy measure of social well being.

4. Is compounding in the growth rate important?

Good heavens, yes. We usually measure economic growth by computing the average annual rate of change of GDP, as was done above. This is usually a small number, somewhere between 1 and 7 percent annually, depending upon the type of growth being measured. However, because of compounding, even what appears to be small rates of economic growth becomes very large if maintained over a long period of time. For example, if the economy grows at 2.0 percent per year, in real terms per capita, then after 20 years, ***GDP per capita*** will be almost 50 percent higher than at the beginning. But if the economy grows at 3.0 percent per year, then after only 20 years, per capita income will be over 80 percent larger, a significant difference. You can make your own calculations by using the following formula,

$(1 + r)^n - 1$ = percent change after n years. For example, $(1 + .02)^{10} = 1.22$. After subtracting the 1, this is an increase of 22% after ten years. You should try it some time. You can use the same simple formula to calculate how quickly your savings will grow at different rates of return. If you use a rate of return other than a bank savings deposit, or a U.S. bond, be sure to include an allowance for risk.

5. What determines the total GDP of a country?

Many of the factors should be obvious and have been previously discussed. ***This is largely a review of earlier lessons (notes 2 and 5).***

1 *Quantity of resources and the extent of their use*: Obviously, GDP will tend to be greater, the greater the amount of resources available and used for production,. Remember, resources are comprised of land (including the minerals in it and the trees and other resources on it), labor, and capital. Many economists would add a fourth critical type of resource, entrepreneurship, or the ability to manage these resources.

2. *Quality of resources:* As discussed before, somewhere around the middle 1950's, economists at the University of Chicago, began emphasizing the quality, as well as the quantity, of available resources, an issue raised by Adam Smith in the 1700s, but not often emphasized afterward. The new emphasis on quality was largely a result of work carried out by economists in Post WW II Germany. The conventional wisdom was that Germany had been so severely devastated that it would take years to recover. Amazingly, Germany recovered quickly (well, much quicker than expected) and the recovery was considered miraculous. Economists at the University of Chicago posited that the recovery was largely due to the *industriousness, education, and health* of the German worker. The concept of the importance of the ***"quality"*** of labor quickly became of major importance. You received a taste of it when you were told how your earnings would rise as you achieved higher and higher levels of education and acquired work skills. The term, "quality of labor," is largely used to refer to the education of workers, but should probably also include their general health, work habits and acquired knowledge. The quality of the labor force is becoming increasingly important as it requires skilled workers to utilize ever advancing technology. The "quality of Capital" refers largely to the technology embedded in it, a technology that has be growing by leaps and bounds in the last 200 years. The "quality of land" is determined by factors such as location, natural resources, fertility, etc., as previously discussed.

With respect to the quality of labor, economists often use an ill-defined term, the ***stock of human capital***. Some economists measure the stock of human capital by the dollars spent on educating the work force during the time they were in school, or the number of years of schooling. Others, more wise, note that health and work habits, all influenced by past expenditures, are also highly important, and some economists include expenditures on re-employment and rehabilitation programs as part of the stock of human capital. Actually, if we knew how, we should also include the value to the unpaid time spent by parents and others providing care. The concept of human capital is clear, but establishing precise cut-off points for what is and what is not human capital is difficult and efforts to do so are pointless.

Of course, the stock of human capital grows each year due to academic education, vocational training, and on-the job learning and other activities. This growth of human capital is termed ***investment in people***, i.e., the amount spent annually. Such investment has grown increasingly politically important over the years, e.g., the no child left behind program. There is a growing emphasis on raising educational levels in developing countries. I wish we had a similar concern about ensuring access to college for all citizens in the U.S., ***including*** for adults who wish to begin or return to college.

3. *Economic System*: Like it or not, countries with competitive markets **almost** always grow faster than countries that plan significant parts of their economies (and usually end up being overwhelmed by their bureaucracies, e.g., restrictions on enterprises, red tape, etc). Similarly, countries in which peoples' welfare is determined primarily by the ability to obtain and retain high paying employment do better than countries that provide their citizens with extensive protection against unemployment, old age, etc. Greed, and fear for one's job, distasteful as these motives are, have driven the U.S. to unprecedented economic growth. Socialism, a softer approach, and often favored by young people usually leads to failure despite its noble objectives. Partial socialism, such as they have in Europe, seems to lead to much less vibrancy in the economy, which may partly account for their high rates of unemployment. Similar stagnation sometimes occurs in bureaucracies in large private firms where middle level workers are generally secure in their jobs and there is often no meaningful way to measure their contribution to the firms revenues.

Despite being considered as comprised of developed countries, Western Europe appears to be growing its per capita GDP less rapidly than they believe is desirable, and is lagging behind the U.S. Much of Western Europe is burdened by legislation that makes it costly for entrepreneurs to produce at their lowest cost, e.g., government requirements for short work hours, long vacations, generous unemployment insurance, difficulty in discharging workers, high severance pay. In contrast, Eastern Europe, with much lower wages and less generous benefits seems to be flourishing, or at least was before the latest recession.

4. *Infrastructure:* Vigorous economic growth requires good roads, electric grids, water systems, developed legal systems, police protection, avoidance of internal conflicts, etc. Some people argue that the need for a more efficient method of transmitting electricity over long distances is hindering the development of wind and solar energy.

5. *International trade:* All countries, small countries more so than large countries, ***must have international trade in which they concentrate on producing the goods and services they can produce most efficiently and trade for other goods they need..*** This is the only way in which they can reap the efficiencies of economies of scale, as well as trade for goods that are not in ready supply in the country (can you imagine how much GDP in the U.S. would decline if we could not trade for oil, copper, rubber, and other essential items).

6. What cause economies to grow, *per capita*?

Obviously, this is an essential determinant of living standards. Let us consider three cases, one of developed countries. one of underdeveloped countries, and one of small countries.

6A, Developed countries.

In a country like the United States, many citizens (but not enough) have acquired skills that enable them to work on complex jobs. In addition, the U.S. has sufficient capital that it can employ workers, in the main, on advanced production methods which utilize their skills. Much production is automated and is energy intensive. The *primary* sources of growth is in developed countries are:

Advancing technology: This is the ***most important*** source of growth. Improvements in production methods have continued at an unprecedented rate since WWII. Spurts in technology have fueled the industrial revolution during the last 300 or more years, and the end does not appear in sight, not even remotely. Other important sources of per capita growth in developed countries are:

Continued capital investment: This is needed mainly in order to take advantage of advancing technology;

Continued improvements in human skills: This is needed mainly in order to utilize changing technology and to reduce wasted and idle labor resources. Many Americans would benefit if their skills or their health were improved.

*Much better employment programs: P*articularly for elderly and/or disabled persons. This will become increasingly important as the labor force ages and the age of retirement rises.

Continuing development of resources: For example, in order to keep growing, we need to develop alternative sources of energy, and of raw materials (or substitutes), e.g., copper, iron. Among ways to do this are:

- Ongoing and strong support for science and technological development, part of which will be accomplished by enhancing the education of citizens - think of what the discovery of fracking has meant for our oil supplies;

- Ensure the maintenance of a competitive climate for industry and the labor force. A competitive climate may be endangered by a tendency towards monopoly, and probably a tendency towards overprotection of workers and persons with low incomes, not to mention a "too big to fail"attitude towards large enterprises.

One should note that the U.S. has fallen from its post World War II position as the most productive nation per capita. Moreover, many countries, once considered underdeveloped are rapidly catching up. The future prosperity of all nations, including the U.S. may be a joint function of the growth of technology and the work skills of its citizens, an area in which the U.S. may be, probably is, losing ground (in a relative sense).

6B. Underdeveloped countries.

The ***primary sources of growth in underdeveloped countries*** are:

Capital investment (e.g., plant and equipment) to take advantage of ***existing*** technology;
Note: Some countries, notably in Asia, have achieved these goals with an almost fanatical devotion to saving, and are progressing rapidly as a result. Foreign investment can also help a country industrialize rapidly.

Improving Infrastructure (e.g., streets, power generation, law and order, impartial courts, protection of private property, enforcement of contracts, etc) where many underdeveloped countries are sadly deficient*, which reduces incentives to invest in these countries.*

Human investment*, both in education and in health, obviously*.

The important thing to keep in mind is that underdeveloped countries typically lag far behind in capital availability, technology and the most efficient production methods. In consequence, changes in existing technology are less important to underdeveloped countries than developed countries since the primary need of less developed countries is to employ the technology already in use in developed countries. This requires capital, infrastructure, and skills.

In fact, underdeveloped countries could, theoretically, leapfrog ahead of developed countries if they use the latest technology when investing in equipment whereas more developed countries are loath to replace costly, and perfectly serviceable, but less technologically advanced, equipment. In fact, much economic growth of underdeveloped countries can be achieved by copying the technology developed and utilized by the developed countries, strategies that were successively followed by Japan, Taiwan, Korea, China and many others. Unfortunately, many underdeveloped countries lack the resources and the will to provide the capital, education, and infrastructure needed for this purpose.

6C. Small countries.

One of the important factors determining the productivity of workers is economies of scale, e.g., large enterprises using mass production techniques can dramatically lower the cost of production of individual items.

Two points:

1. Most people, regardless of the country that they live in, wish to consume a wide variety of goods and services.

2. Small countries, if bound to small internal markets, cannot hope to produce this wide array of goods as efficiently as large countries. Size was an important factor in the rapid economic growth of the U.S.

Conclusion: For small countries to enjoy the same level of economic prosperity as large countries, they must develop a limited number of efficient industries that can compete with similar industries in larger countries. Then these small countries must trade this small array of efficiently produced goods for the wide array of goods that they desire and that can be produced more efficiently in other countries.

In effect, ***only if we have world wide free markets*** can we hope to achieve the living standards in all countries that currently exist in developed countries. World wide free trade doesn't guarantee universal prosperity, but it is an essential component. In fact, as we will emphasize in notes 14, trade usually benefits all countries, not just small countries. Ask yourself, how many of you would happily pay ***additional*** dollars in order to buy ***domestically*** produced tv sets, computers, etc. Not many, I suspect.

6D. Wide variation among countries.

Of course, countries vary widely in their state of development, in size, and in the availability of natural resources. In consequence, the most effective policies for growth will also vary by country. What should be clear is that development must proceed in a balanced way, i.e., all of the factors needed for growth need to change at the same time, although depending upon the countries needs, the different factors may change at different rates. After all, there is no purpose in installing highly technical equipment if workers are not available that have the training or capacity to utilize it.

7. Which is more important for the world population, increasing per capita income, or reducing poverty?

This is a very interesting question, particularly given large inequalities in income distribution in poor countries, but is also relevant to developed countries. Most people are obsessed with making more money, regardless of how much, or how little they currently earn. Whether or not increasing income makes people happier is a question that many people argue. I suspect that once people have reasonable shelter, an adequate diet, adequate medical care, a

sense of job security, and an assurance of sufficient income before and after retirement, then further increasing the number of rooms in their house, or the carving on their furniture, or the number and size of cars or tvs that they own, has little impact on how satisfied are with their lives, other than enjoying the continuing envy of less affluent neighbors. Each of you to your own opinion.

The relevant question for policy is: Should we be more concerned with improving average earnings in a country, or in reducing the number of people living in poverty in that country, or, more explicitly, reducing starvation. Of course, increasing average per capita income is usually associated with decreasing poverty, but whether or not by a sufficient amount is for each of you to determine, particularity given the reality of a very unequal income distribution where many citizens do not significantly enjoy the benefits of a growing economy. Note that you can have rising average incomes at the same time as poverty is increasing, if income inequality grows. Focusing on increasing average income to reduce poverty is the *"a rising tide lifts all ships argument."* This, in effect, is the trickle down approach to reducing poverty, Remember, as rapidly as per capita income has increased in the U.S., we are still afflicted with a significant amount of poverty, and in some countries, poverty is the norm rather than the exception.

The question of whether we should focus on reducing poverty or on fostering per capita economic growth has relevance in that it will influence the types of policies that are pursued, particularly in the area of foreign trade and economic assistance given to other countries.

8. Should the U.S. help countries raise their growth rates?

There has been a strong emphasis since the end of WW2 in helping other nations improve the standard of living among their population, although this seems to be becoming more controversial in recent years. Some people believe that when significant sections of the world are impoverished, this creates an inherently unstable situation which threatens the safety and well-being of the more developed nations, an observation that seems to be validated in the current problems facing world peace. In addition to direct financial aid from the developed countries (and some from developing countries), there are important international institutions which promote growth, both in this country and elsewhere. I sometimes wonder if world peace would be better served if we spend less on our military and more on helping poor countries prosper.

One of the most important international institutions is The *World Bank* which assists developing countries by providing long-term financing at preferential rates for economic development, as well as expert advice. It is one of the United Nations' specialized agencies, and is made up of ***188*** member countries. It comprises two institutions: the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA). The IBRD aims to reduce poverty in middle-income and creditworthy poorer countries, while IDA focuses exclusively on the world's poorest countries. The International Bank for Reconstruction and Development, raises almost all its money in the world's financial markets. It typically loans $12 to $15 billion per year. Helpful but not exactly earth shaking.

Another important institution is the *World Trade Organization* which aims to ***increase international trade*** by promoting lower trade barriers and providing a platform for negotiating trade agreements and resolving disputes between member nations, when they arise. The goal is to help producers of goods and services, as well as exporters, and importers, conduct their business. It is hoped that by enabling countries to focus more on the production of goods and services in which they are most efficient, and then trading with other countries, their GDP will rise. But as you have probably read, meetings of the WTO often create controversy because any changes in the terms of trade will inevitably create winners and losers in the short run. This will be further discussed when we talk about international trade.

9. What is Globalization?

Globalization is a frequently used term that we have already discussed. It refers to the increasing integration and increasing interdependency of economies throughout the world. Globalization is manifested by:

- The rising importance of multinational firms that produce in many countries and sell in most countries.
- The rising importance of international trade.
- The number of organizations devoted to establishing conditions that lead to further rises in trade, e.g., NAFTA (discussed in notes 14).
- Increasing levels of tourism, which is really just another form of international trade.
- The spread of the internet and inexpensive communication systems (e.g., telephone, internet, fax) throughout the world so that informed decisions can be made very quickly from anywhere in the world. With the internet, many goods and services can be bought and sold without the convenience of a store, and many people can be hired in distant lands who send their work products over the internet.

Most economists believe that increasing globalization benefits all countries.

- It lets each country specialize in what it does best.

- It permits efficient manufacturers to invest in another country and establish highly efficient productive activities in place of domestic, but inefficient, manufacturing establishments.

Nonetheless, there are several criticisms of globalization.

One, and an obvious concern, is that as globalization spreads, it will disrupt the economies of different countries, causing some workers to lost jobs and some companies to fail. It can be argued that this is simply the normal effects of competition as workers move from less efficient endeavors to more efficient employment, a process that must be faced by workers in all countries. Nonetheless, the adjustment can be painful for some workers, e.g., older workers who may find it difficult to locate new employment.

Other criticisms are:

- Some countries may try to gain a comparative advantage by ignoring pollution and/or, worker safety considerations, or by utilizing child or prison labor. This is absolutely true and an important concern as trade agreements are negotiated.

- Some multinational companies may take advantage of cheap local labor. I suppose it could be argued that this is exploitation. It would appear, however, that in the majority of cases, local workers earn more from these multinational companies than they could on any alternative local employment available to them, otherwise why would they accept a job with a foreign owned company. Eventually competition from other multinational firms for cheap labor, and the natural expansion of business will hopefully bring wages to a level in conformity with wages elsewhere in the world. This may take a great deal of time but it is hard to imagine very many scenarios where workers for these global firms are made worse off.

Overall, globalization has created great benefits, and will probably (hopefully) continue to do so

10. What about population growth?

I saved this for last. This is a sensitive area which few politicians are willing to confront. Most population growth in the world is centered in the Middle East, South Asia, and Africa where populations are still growing rapidly. To talk about the beneficial effects of slowing population growth in these countries will often generate angry resistance and sometimes causes the advocates of limiting population growth to be accused of ethnic or religious bigotry.

However, it is obvious that It does little good to grow an economy if population increases even more rapidly than production (remember Thomas Malthus) . And it is difficult for large families to educate their children and maintain them in good health if their earnings are low. Some economists have even noted that it may be pointless to help poor overpopulated countries if it just expands the population and makes a bad problem ultimately unsolvable.

Countries with rapidly growing populations are probably going to have to choose between staying poor, curtailing births, or flooding the developed countries with immigrants. Large scale immigration is currently happening, and probably will continue to occur, but is already creating strong resistance and many would be emigrants, hoping for a better life, have lost their lives by drowning, starvation, or extreme dehydration, and have often been disappointed by the quality of life that is available to them in another, more advanced, country.

In the past, immigration has been a safety valve for a country's unwanted and poor people. Much immigration has been towards the U.S. and more recently, towards Europe. However, the sheer extent of poverty in the world renders this a nonviable solution. It is not possible to occur on a scale sufficient to make more than a small and inconsequential dent in world poverty. The affluent countries simply do not have enough space to accommodate all those who wish to migrate. The growth of the world's population, currently estimated at about 7.5 billion, is slowing and forecast by many experts to level off at about 9.2 billion in 2050. These are speculative estimates and depend upon many underlying assumptions, e.g., that women will become increasingly educated in the world and are increasingly granted basic rights, which usually leads to a decline in birth rates. I have seen much higher estimates of the population that may be reached in the world in your lifetime. I have also seen estimates that are much lower. Important factors that will determine future world population are the rights and freedoms granted to women and their increasing (hopefully) access to education.

As an interesting observation. In this country many people have gone from admiring large families with many children to disdaining such families, particularly if some large families lack the income to adequately feed, care, and educate their children. apparently expecting other to accept this financial burden

You might find the following estimates of population interesting.

World Population Growth

Year	Population
1	231 million
1500	450 million
1650	500 million
1750	700 million
1804	1 billion
1850	1.2 billion
1900	1.6 billion
1927	2 billion
1950	2.55 billion
1955	2.8 billion
1960	3 billion
1965	3.3 billion
1970	3.7 billion
1975	4 billion
1980	4.5 billion
1985	4.85 billion
1990	5.3 billion
1995	5.7 billion
1999	6 billion
2000	6.1 billion
2005	6.45 billion
2006	6.5 billion

2010 6.8 billion
2011 7.0 billion
2020 7.5 billion
2030 8.5 billion (estimated/guesstimated of course)
2050 9.7 billion (estimated/guesstimated of course)
2100 11,2 billion (estimated/guesstimated of course)

Random comments

- Unfortunately recent studies have concluded that it would take two or three earthlike planets (with similar levels of natural resources) to enable all people *currently* living to maintain the same living standards as exists in developed countries.

- Continued migration to the developed countries will eventually cause overcrowding and lowering of living standards for many. Already, the U.S. is becoming over stressed. What appeared some years ago to be an abundant water supply is not longer abundant. Some regions are running out of water. There is no room left for many large mammals - wolves, mountain lions, moose no longer exist in the U.S. except for a few specimens. Worldwide, species are being wiped out at a rate greater than at any time in the Earth's history, including the time a comet hit and wiped out the dinosaurs, mostly because of diminishing habitat for animals to live in. The oceans are becoming polluted and fish stocks are crashing and some types of fish are in danger of extinction. Sooner or later, *if* the earth's population is to prosper, we must confront the population issue, and I am quite positive that it will be during your lifetime.

What should we do. Perhaps technology will save us. There are lots of sources of clean energy if we could ever learn to capture and exploit them. Sufficient energy can solve many of our problems.

Perhaps populations will decline. With a population of only 2 billion (as existed in 1927, less than 100 years ago) the world could survive most problems, eliminate global warning, and create all the power it needs from sources other than fossil fuels.

Perhaps the entire world (not any one country) should consider steps that might encourage a reduction in population and that would stress the dignity and prosperity of individual inhabitants throughout the world.

It is ironic that what is probably the most important step that must be taken to create world wide prosperity (and probably deal with global warming) for future generations, i.e., limiting population growth, receives little serious attention from politicians and decision makers (although Al Gore has blamed population growth for a great deal of global warming).

We should note that China and India have placed great emphasis on population control, and that some other countries, e.g., Iran, Egypt, and a few others seem to be taking an interest in limiting their populations.

Review Questions:

1. Identify the major source of economic growth in developed countries with robust economies and a well trained labor force. Identify three activities which could help most undeveloped countries increase their rate of growth. Name two impediments that underdeveloped countries might face in trying to achieve rapid economic growth.

2. One goal of society is to reduce poverty. Do you think raising the minimum wage is a good way to achieve this goal? Do you think that most people who make less than the minimum wage could be trained to perform higher paying jobs?

3. If nominal GDP in a country grows 5 percent per year, by how much has it grown at the end of two years? If inflation is 2 percent per year, will real GDP grow as much as nominal GDP?

4. Can you think of any population control policies that would be acceptable in countries where, by religion or custom, large families are encouraged?

5. England has a much more U.S. style economy than much of Western Europe. Do you think Western European countries should reduce the individual safety net that is increasing their costs of production and driving firms to Eastern Europe?

6. The percentage of women in the U.S. who work has risen drastically in the last 50 years. What effect has this had on nominal GDP, both total and per capita? What effect has this had on real GDP, both total and per capita?

7. Which do you think is more important - reducing the number of people living in poverty, or increasing per capita GDP?

8. Should poverty be measured by per capita GDP, or such measures as live expectancies, health status, availability of safe water, availability of electricity, adequacy of diet, etc.?

9. If our goal is to raise per capita GDP, is it wise to keep admitting immigrants who work at low-wage jobs?

10. Should underdeveloped countries focus more on developing an infrastructure, a trained work force, an industrial base, or a balanced approach of all three of these productivity enhancing factors?

11. Which is more important, the nominal growth of GDP or the real growth of GDP?

12. How do you measure nominal per capita GDP growth? How do you measure “real” ***per capita*** GDP?

13. Suppose you divide GDP by the number in the work force. In what way would that statistic differ from per capita GDP?

14. Would per capita GDP grow if the percentage of women in the labor force grew?

15. If per capita GDP increases, does this mean that all people in the nation benefit?

16. Do you think that income is distributed unfairly in some countries? What about the US? Why?

17. The U.S. is producing far fewer engineers and scientists than countries such as China, India, and Korea. Do you think we should encourage more U.S. students to major in these fields? If so, how should we change our current policies?

18. Despite our guarantees of education to all children, we have large numbers of adults with minimal education, and large numbers of children who are not doing well in school. Would improving our educational system help us to grow the economy? If so, how should we improve the educational system?

19. If poverty is a major concern for you, what do you think we should do for individuals who fail to finish high school and have not acquired important work skills?

20. Do you think that immigration of large numbers of individuals from poor countries with expanding populations to developed countries is a useful way to combat world poverty? In answering this question, consider the difference between allowing immigration of people without education or work skills, and immigration of highly trained professionals.

21. Do you think that we should assist underdeveloped countries whose poverty stems from a reluctance to pursue policies to limit birth rates, or that deny equal rights of education and labor force participation to women, or where a large part of the population is denied elementary schooling?

22. What is meant by globalization?

23. In what ways does globalization benefit countries throughout the world?

24. In what ways could globalization be harmful to some people?