Welcome to The Power of Macroeconomics. While much of the focus of our macroeconomics studies has been on the major industrialized nations of the world, we are going to turn our attention now to the developing countries of Africa, Asia, and Latin America. Home to about three fourth of the world population. Begin, let's explain what we mean by a developing country. Some textbooks prefer the term less developed country, or LDC while others simply say developing country or DVC. Regardless, the most important characteristic of developing countries, is that the people have low per capita incomes. In addition, people in developing countries usually have poor health and a short life expectancy, suffer from malnutrition, and have low levels of literacy. To put a human face on this, put yourself now in the shoes of a typical 25 year-old in a low income country such as Mali, India or Bangladesh. Your annual income barely averages $500. Your life expectancy is 4 5th that of the average person in an advanced country. And already, two of your brothers and sisters have died before reaching adulthood. You can barely read and you work very long hours in the fields without the benefit of machinery, and with but 1 60th of the horsepower of a prosperous North American worker. At night you sleep on a mat in a one-room room house, along with your parents and grand parents and five children. Your house has no electricity, indoor toilet or fresh water supply. You have little household furniture, perhaps a table and a radio. Your only mode of transportation is an old pair of boots while despite much sickness in your village, qualified doctors are far away tending to the needs of wealthier families. You and your fellow citizens in the 40 poorest countries, constitute 55% of the world's population, but must divide among each other only 4% of world income. You're often hungry and the food you eat is mainly roughage or rice, you have little or no hope of ever seeing your life improve. This is a grim life indeed. Now let's take a more systematic look at this problem. Let's start with this table, which shows the stark disparity in wealth among the nations of the world. Here, we see that the richest 20% of the world's population captures almost 83% of its income, while the poorest 20% earns less than 2%.

To understand why some countries reach their potential while others fail, we need to look more systematically now at the process of economic development. Recall in our lesson on economic growth, we learned that productivity in growth in the modernized industrialized economies depend on four major supply side factors. Human resources, natural resources, capital formation and technology. Let's see now how each of these factors operates in developing countries. Let's start with human resources, and here we have two dimensions. The quantity of labour, and it's quality. On the quantity issue because of rapid population growth, many poor countries are forever running hard just to stay in place. The problem is that even as a poor nation's GDP rises, so too does its population, so that many developing countries are never able to escape the Malthusian trap of high birth rates and stagnant incomes. This table and chart help put this population problem in its appropriate global perspective. The table on the left shows how birth rates in developing countries like Pakistan, Venezuela, and Kenya are more than twice that of the United States. Now take a look at the right hand figure. How much is the world population is expected to grow over the next century? And, in which category of countries will the bulk of this growth occur. You can see that world population is expected to double over the next century. More importantly, as the brown and pink portions of the figure indicate, most of this increase is expected to come in the low and middle income countries of the world. However, with such high birth rates, it will be extremely hard for poor countries to throw off their chains of poverty. So what strategies might be adopted to address overpopulation? One such strategy is to try and directly control that growth, even when such actions run against prevailing religious norms. For example some Catholic countries in Latin America have introduced educational campaigns, and subsidized birth control despite church doctrine. In Asia, China has been particularly forceful in curbing population growth by putting tight quotas on the number of births, and imposing economic penalties, and mandatory sterilization. On those who violate their baby quota. Note however, that some experts hold a view contrary to the traditional one that population growth can only be controlled directly. This demographic transition view holds that, rising income first must be achieved before slower population growth can be achieved. It is an interesting argument that based in large part on micro economic reasoning. The idea is that there are both marginal costs and marginal benefits associated with having another child. In the developing countries, the marginal benefits are relatively large, because the extra child becomes an extra worker to support the family and a safety net for parents in their senior years. However, in the wealthier, industrialized nations, the marginal cost of children is much greater than in the developing countries, because of the high costs of things like health care, day care and education. The same time, in the industrialized nations, there is a government safety net for senior citizens, in the form of retirement and healthcare programs, so children as retirement insurance are less necessary. Thus, in this demographic transition view, as a country industrializes, people will choose to have fewer children. Indeed in countries like Mexico, South Korea and Taiwan, we have seen birth rates drop sharply as their incomes rose and their populations receive more education.

Turning now to human resource quality, the crucial role of skilled labor has been shown again and again when sophisticated mining, defense, or manufacturing machinery has fallen into disrepair and disuse because the labor force of developing countries did not have the necessary skills for operation and maitenance. Accordingly, development programs to improve education, reduce illiteracy, and train workers, as well as to improve public safety and health, can make a developing country's population much more productive. This is because workers can learn to use capital more effectively, adopt new technologies, lose fewer days to sickness or injury, and better learn from their mistakes.

In this regard, for advanced learning in science, engineering, medicine, and management, countries can benefit by sending their best minds abroad to bring back the newest advances. But, there is a big warning sign that must be posted here. Countries must be aware of the brain drain, in which the most able people get drawn off to high-wage countries.

Let's turn now to the second factor in economic growth, natural resources. Perhaps the most valuable natural resource of developing countries is arable land. Much of the labor force in developing countries is employed in farming. Hence, the productive use of land, with appropriate conservation, fertilizers, and tillage, will go far in increasing a poor nation's output.

However, some poor countries of Africa and Asia have meager endowments of natural resources. And such land and minerals as they do possess must be divided among dense populations. Economists suspect that natural wealth from oil or minerals is not an unalloyed blessing. Some countries like the United States, Canada and Norway have used their natural wealth to form the solid base of industrial expansion. In other countries the wealth has been like loot subject to plunder and rent seeking by corrupt leaders and military cliques. Countries like Nigeria and Zaire, which are fabulously wealthy in terms of mineral resources fail to convert their underground assets into productive human or tangible capital because of venal rulers who drained that wealth into their own bank accounts and conspicuous consumption.

At the same time, land ownership patterns are key to providing farmers with strong incentives to invest in capital and technologies that will increase their land's yield. When farmers own their own land, they have better incentives to make improvements, such as irrigation systems, and undertake appropriate conservation practices. However, in developing countries, a small handful of the wealthy own a large percentage of the land. This kind of land ownership patterns not only discourages production. It has also led to violent socialist revolutions and civil strife in more than one developing country.

Regarding the third factor in growth, capital formation, a modern economy requires a vast array of capital goods. However, the only way countries can rapidly deepen their capital stock is by abstaining from current consumption. And that's the catch for many developing countries that are poor to begin with. Because reducing current consumption to provide for future consumption often seems impossible. Nonetheless, the role of capital formation in economic growth cannot be understated. Consider that the leaders in the growth race invest at least 20% of output in capital formation. By contrast, the poorest agrarian countries are often able to save and invest only 5% of their national income. Moreover, much of the low level of savings goes to provide the growing population with housing and simple tools. Little is left over for development. The result is too little investment in the productive capital so indispensable for rapid economic progress. Turning to the fourth supply factor of economic growth, technological change, developing countries have one potential advantage here, they can benefit by relying on the technological progress of more advanced nations. In this regard, poor countries do not need to find modern Newtons to discover the law of gravity. They can read about it in any physics book. Nor do they have to repeat the slow, meandering inventions of the Industrial Revolution. They can buy tractors, computers and power looms. Undreamed of by the great merchants of the past. Japan and the United States, clearly illustrate this pattern in their historical developments. Japan joined the industrial race late, and only at the end of the 19th century did it send students abroad to study Western technology. Same time, the Japanese government has taken an active role in stimulating the pace of development and in building infrastructure such as railroads and utilities. The case of the United States likewise provides a hopeful example to the rest of the world. The key inventions involved in the automobile originated almost exclusively abroad. Nevertheless, Ford and General Motors applied foreign inventions and rapidly became the world leaders in the automotive industry. From the histories of Japan and the United States, it might appear that adaptation of foreign technology is an easy recipe for development. You might say, just go abroad, copy more efficient methods, put them into effect at home, and sit back and wait for the extra output to roll in. Last, technological change is not that simple. You can send a textbook on chemical engineering to Bangladesh or Somalia. Without adequate human resources, skilled scientists, engineers and entrepreneurs, these countries can't even begin to think about building a working petrochemical plant.

Having discussed the four major elements of growth and development, lets now come to better understand why some developing countries like Chili, Costa Rica and the Philippines enjoy relative prosperity. While others like Chad, Senegal and Gabon stagnate. Basic problem is the vicious circle of poverty that some countries fall prey to, as illustrated in this figure. The center of this circle is rapid population growth. This leads to low per capital income that leads to both a low level of savings and a low level of aggregate demand. This in turn leads to low levels of investment in both physical and human capital. The result is low productivity and low per capital income and the circle continues.

Other elements of poverty are likewise reinforcing because poverty is accompanied by low levels of education, literacy and skill.

These in turn prevent the adoption of new and improved technologies.

Overcoming the barriers of poverty often requires a concerted effort on many fronts. And some development economist recommend a big push forward to break the vicious circle. If a country is fortunate, simultaneous steps to invest more improve health and education, develop skills and curb population growth. Can break the vicious cycle of poverty. And stimulate a virtuous circle of rapid economic development.

But, which countries will be the fortunate ones and why? Economists, historians and social scientists have long been fascinated by these questions. And the obvious differences in the pace of economic growth among nations. Some early theories stressed a hospitable climate noting that all advanced countries lie in the earth's temperate zone. Others have pointed to custom, culture or religion as a key factor. Max Weber, for example, emphasized the Protestant ethic as a driving force behind capitalism. More recently, Mancur Olson has argued that nations begin to decline when their decision structure becomes brittle and interest groups or oligarchies prevent social and economic change.

No doubt, each of these theories has some validity for a particular time and place but they do not hold up as universal explanations of economic development. Weber's theory leaves unexplained why the cradle of civilization appeared in the near East and Greece while the later dominant Europeans lived in caves, worshiped trolls and wore bear skins. Where do we find the Protestant ethic in bustling Hong Kong? How can we explain that a country like Japan with a rigid social structure and powerful lobbies has become one of the world's most productive economies?

The failure of these early theories to fully explain economic development has spawned more modern views. Here's just a sampling of the debate over what the best strategy is for a country to break out of the vicious cycle of poverty and begin to mobilize the factors of economic development. Let's begin with the issue of relying upon an industrial or agricultural economy.

One of the most important choices the leaders of a developing country can make is whether to pursue a strategy of rapid industrialization to achieve growth as opposed to simply expanding and improving their agricultural base. In the past, such a choice was typically resolved in favor of industrialization as developing countries sought to mimic the successes of the industrialized nations. Today however, the lesson of decades of attempt to accelerate industrialization at the expense of agriculture has led many analysts to rethink the role of farming. Here's the problem. Industrialization is captial intensive. It attracts workers into crowded cities and it often produces high levels of unemployment. On the other hand, raising productivity on farms typically requires far less capital while providing productive employment for surplus labor. Indeed, if Bangladesh could increase the productivity of its farming by just 20%. That advance would do more to release resources for the production of comforts. Then we're trying to construct a domestic steel industry to displace imports.

The second major issue in development strategy is whether a country is better off relying upon a state-run versus market-oriented economy. The important elements of a market oriented policy include, an outward orientation and trade policy. Low tariffs and few quantitative trade restrictions, the promotion of small business and the fostering of competition. Moreover, markets work best in a stable macroeconomic environment. One, in which taxes are predictable and inflation is low. However, the problem here is that the cultures of many developing countries are hostile to the operation of markets. Often competition among firms or profit seeking behavior is contrary to traditional practices, religious beliefs or vested interest.

Yet decades of experience suggest that extensive reliance on markets provides the most effective way of managing economy and promotoing rapid economic growth. Still a third issue, development strategy has to do with the openness of an economy to international trade.

For example, should a developing country pursue a strategy of import substitution by replacing most imports with domestic production? Or should a country pursue a strategy of openness or outward orientation? That is, should it strives to pay for its imports by improving efficiency and competitiveness, developing foreign markets and keeping trade barriers low?

Historically policies of import substitution were often popular in Latin America until the 1980s. And indeed the policy most frequently used toward this end was to build high tariff walls around manufacturing industries, so that local firms could produce and sell goods that would otherwise be imported. In contrast, in age show countries like Taiwan, South Korea and Singapore have preferred an openness strategy. Such a policy keeps trade barriers as low as practical by relying primarily on tariffs rather than quotas. And other non-tariff barriers. It minimizes the interference with capital flow and allows supply and demand to operate in financial markets. It avoids a state monopoly on exports and imports. It keeps government regulation to bare necessities for an orderly market economy. Above all, it relies primarily on a private market system of profits and losses to guide production, rather than depending on public ownership and control or the commands of a government planning system. Now, what is perhaps most interesting here is that just a generation ago, Taiwan, South Korea and Singapore all had per capital incomes one-quarter to one-third of those in the wealthiest Latin American countries. Yet, by saving large fractions of their national incomes and channeling these to high-return export industries, these countries overtook every Latin American country by the late 1980s. Secret to success was not a doctrinaire laissez-faire policy but the government in fact engaged in selective planning and intervention. Rather, the openness and outward orientation allowed the countries to reap economies of scale and the benefits of international specialization. And thus to increase employment, use domestic resources effectively, enjoy rapid productivity growth and provide enormous gains in living standards. This figure drives home the point that open economies generally do better than closed ones. You can see in the left-hand figure that closed economies, like Angola, Mozambique and Ghana grow slowly while in the right-hand figure, countries like Thailand, Malaysia and Indonesia have done much better.

So what's the bottom line for successful strategies of economic development. Decades of experience in dozens of countries have lead many development economists to this of nine suggstions to enhance economic growth. These range from, establishing the rule of law, opening economies to international trade. And controlling population growth to establishing independent central banks to avoid hyper inflation, establishing realistic exchange rate policies to prevent major currency shocks, and privatizing state industries to improve efficiency and promote entrepreneurship. At the same time it is clear that the industrialized nations of the world can play a very constructive role in helping the developing countries grow. One way is to provide more foreign capital, both public and private. And to better target such aid to the poorest developing countries. In this regard, the United States and many other industrialized nations already assist the developing countries with substantial foreign aid in the form of both loans and grants.

A second way for the industrialized nations to spur economic development in the developing countries would be to further reduce their own trade barriers. This would allow developing countries to expand their national incomes through increased trade. But such a step can be politically controversial because it raises the specter of industrialized workers having to compete against people willing to work for a dollar or less a day. Still a third way the industrialized nations can help is to provide debt relief. The problem here is that the current debt load of many developing countries is so large that monies which would otherwise go to investment in the countries has to be used for servicing these debts. The fourth way the industrialized nations might help is by addressing an issue we raised earlier. The so called brain drain. The problem here is that many of the best and brightest workers int he developing countries come to the industrialized nations temporarily to get and education but wind up staying permanently to work. Rather than returning to help build the economies of their homelands. This brain drain contributes to the deterioration in the overall skill level and productivity of labor forces often least able to suffer such losses. A final way to help developing countries grow is to discourage arms sales to them. While such sales create jobs and profits in the industrialized nations, they also divert precious public expenditures from infrastructure and education.

Well, I do hope you've enjoyed this introductory course in the principles of macroeconomics. I also hope that I've convinced you about the real power of this subject to help you in both your personal and professional lives. At this point, I would humbly like to suggest that you commit to making the study of macro economics a life long endeavor. I do not mean that you necessarily have to go to the intermediate and advanced levels of macroeconomics in an academic environment. Instead what I'm asking you to do is to commit yourself to further building your economic and finiancial market literacy by regularly following the financial press on a daily basis. This financial press comes in many forms. For example, in daily newspapers like the Financial Times. Investors Business Daily and the Wall Street Journal, or in weekly magazines like Barron's and the Economist. In addition to these print venues there are also cable networks such as Bloomberg TV and CNBC. My suggestion here is that you use a digital video recorder like Tivo, to record CNBC or Bloomberg every weekday morning. Just after the stock and bond markets open, this really is the best time to watch these financial networks as their analysts will help you interpret events as they may affect both the economy and stock market. Of course, I'm talking about events like a Federal Reserve rate hike. A sharp drop in the unemployment rate, a drought affecting crop prices, an oil price shock, and so on. Given what you've learned in this course, you really should have all the tools you need to interpret how such events might affect everything from your stock portfolio, to your job or your business. As a follow-up to this course, I also urge you to consider learning the art of stock trading. I'm certainly not suggesting you do this with real money at the beginning, you will almost surely loose. However, there are websites like www.stocktrak.com and www.wallstreetsurvivor.com, that do allow you to trade stocks Using what is essentially play money. I strongly urge you to try this out. It's a lot of fun and you should learn very quickly how broad macroeconomic events affect movements in the financial markets. And, as you accumulate wealth over the course of your life, this knowledge and your stocks trading skills, should serve you well. At any rate, thanks for spending all that time and hard work on mastering the principles of macroeconomics. While money certainly isn't everything, financial prosperity and security can be important components of everyone's quality of life, and if you really understand how broad macroeconomical forces affect you. You really will do much better with your finances when it is all said and done. So, good luck to you and do feel free to look at some of the recommended readings to further expand your horizons. If you found this class interesting, you may also be pleased to know that there is a companion course that teaches the principles of microeconomics as well. So take care, I'm Peter Navarro from University of Calfornia Irvine. I hope to meet you down the road.