

## MCDB 150 Global Problems of Population Growth Lecture 18 Notes

In a previous lecture, I described the traditional (pre-revolution) Chinese system of population control. One of the main factors in the control was post-natal: i.e. female infanticide.

We also saw that the birth rate in marriage was much less than Europe's.

We asked whether this was evidence of pre-natal control of conception?

Some Chinese demographers suggest that the low birth rate was due to a low frequency of intercourse. This, in turn, was due to cultural constraints affecting all individuals:

- a) Lack of opportunity crowded living, story of grandmother in double-decker bed.
- b) Confucian morality requires deference of wife to husband. Friendship and passion are frowned upon.

The alternative is individual choice, with fertility determined by the circumstances of individual families. How can we get evidence of whether individual response to circumstances was a large factor in fertility?

Two factors that would differ family by family, would be the death of a child and the sex of previous children.

The death of a child is a dramatic event in a family's reproductive history.

If anything is going to change fertility intentions, one would expect this to be a major factor.

Do parents who lose children, keep trying longer to try to make up for the loss?

Does their age at last birth reflect an attempt to make up for a lost child?

SLIDE 1 shows that there is very little difference in age of last birth depending on the death of prior children. Even if the first four children have all died, the difference is not more than 0.4 years (compared to families whose first 4 children all survived. No comparison in the chart shows more than an 0.6 year difference.

(Why separate data into age at first birth categories? Because in pre-modern times, childbirth carried such a big burden of morbidity and mortality (disability and death) that women who start childbearing earlier are likely to die or be rendered sterile earlier. So these different groups can't really be compared. A similar consideration applies to women who have had different numbers of children. The older age at last birth for women who have had a lot of children, could just mean that they managed to survive and remain fertile, rather than that they had any different stopping intentions).

[SLIDE 2 AND 3 MAY BE REVERSED FROM THE ORDER THAT I SHOWED THEM IN LECTURE.

In China bearing sons was critical, and having a girl might even be considered an unwelcome event. One would expect big differences in reproductive behavior depending on the sex composition of a family's previous children.

In slide 2, the boxes at the left edge of the triangle shows the age at last birth for mothers who have had only boys. The top box shows women who have had only 1 son. The lowest box shows those who have had 8 sons in a row. SLIDE 2

The left edge shows the age at last birth for mothers who have had only girls.

Compare the age at last birth for mothers who have had 8 sons (age 41.4) with mothers who have had 8 daughters (41.7). The difference is only 0.3 years (about 3½ months). This is only a 1% difference in a ~30 year reproductive life span.

All the comparisons between women with all sons and those w/ all daughters are 0.6 years or less except for 7 sons or daughters which is 1.3 years.

Notice that women who have only 1 child had them at a very late age (38). Since almost all women married young, this probably means that they were trying for many years before succeeding in having a child. In a deprived setting, carrying a pregnancy to completion is not always an easy task. You may notice that women with more children have their last child later. This probably just means that these women managed to survive and remain fertile through many childbirths, rather than that they had any different fertility intentions.

SLIDE 3 shows “parity progression ratios” (PPR). These are the fraction of women who have already had a certain # of children who progress to having another child. On the left edge notice that ~¾ of women (0.724 =72.4%) with 7 sons go on to have another child. Compare this to the 0.760 (=76%) of women who have had 7 daughters that go on to have another child. The difference is 0.036 = 3.6%; a small difference. The other comparisons are also all small. This data shows a maximum difference of 0.1 (10%) between couples who have had all boys vs. all girls (the max is 8 sons vs. 8 daughters).

In summary, there is a very small response to the key factors in reproductive life.

In Europe, “stopping behavior” was discovered where the age at last birth dropped decisively during Europe’s fertility transition. Mostly, Europeans had the children they wanted when they were fairly young and then stopped. This did not happen in China with this cohort of women. All of the ages of last birth are at least 38.

Last lecture we ended by discussing China’s One-Child policy.

On paper, the policy was Draconian:

By 1982-1983 the regulations included: p72 (background) Int Fam Plan Persp 24 6/98

Each village would get a quota for the number of births that year.

The village leaders would ration these out on the basis of a waiting list.

Of course, only couples w/ no prior children were eligible.

Mandatory IUD insertion for women who already had 1 child.

If a woman had an unauthorized pregnancy,

an abortion was supposed to be mandatory

Sterilization for any couple which had 2 or more children.

But, the statistics show another story.

The TFR did not drop during years of the most stringent enforcement (from 1980-1990) of the one child policy: All observers agree on this.

Here is official Chinese data

SLIDE 4

Here is the US Census Bureau

SLIDE 5

In fact, in the most careful studies, the TFR initially went up noticeably.

Feeney SLIDE 6

Through the 80s, the rural TFR bounced around 3

US Census Bureau #7

While the Urban TFR bounced between 1 and 2.

The Total TFR stayed at about 2 ½.

The goal of the one-child policy was a TFR of 1.

But the people had 2 ½ times as many children as they were supposed to.

In the attempt to enforce the 1 child policy, there were major human rights abuses including forced sterilizations and forced abortions.

This was especially true of people who had government jobs or worked in government owned factories – which was a big fraction of the economy.

These workers were totally dependent on the state for their sustenance.

These government workers were concentrated in the cities and in the cities there was tighter control of the people.

The urban people had already gone through their fertility transition and many didn't want much more than 1 child.

People were beginning to stream into the cities from the countryside and housing and every other facility was extremely scarce and it was very difficult to find space and resources for children.

In the cities there was compliance and the policy looked fairly successful.

Among the urban population the TFR dropped to 1.2.

Only 20% above the One-Child Target

However, 80% of China lived in villages, and there the story was different.

Prior to 1978, peasants lived on huge communes where the government set production quotas, all crops had to be sold to the government at a government set price. In turn all the rations of food and everything else came from the government. There was no way a person could escape government control.

Starting in 1978, the collective agricultural system was dismantled.

Land was returned to individual farmers. When people had their own plots of land, they could sell food and anything else that they manufactured on the open market, they started accumulating money and goods of their own.

Fairly rapidly, if the government tried to impose something that the people didn't want, they could just tell the government to go to hell, that they didn't need anything from the government, and that they would take care of themselves.

In addition, as the urban economy improved, peasants migrated to the cities. Government controls on location of residence loosened up.

This allowed people to hide births by shifting the reported location of a birth to the family of friends, cousins or other relatives.

For Instance: John Pomfret: China Losing war on Births; Uneven enforcement Undermines One-child Policy. Washington Post 5/3/00 page A1:

"No one can accuse Huo Suifa of not knowing what he wanted. The 47-year-old farmer dreamed of having a son. After 7 daughters, he finally got a male heir in 1989. Huo named him Gaifeng, or "change in the weather," and stopped having children. "It wasn't easy to have all those children, but it wasn't hard either" said farmer Huo "If things became tough in our village, my wife went to another township to have the child." How does Huo support his family of a wife and 8 children? He has 1/3 of an acre of land."

The national government sets out guidelines, but doesn't establish rules. That is left to the provinces and the provinces leave implementation to the counties who pass responsibility down to smaller geographic units. As a result, the policy is very unevenly applied. So, in some provinces 60% of the births will be unauthorized, while in neighboring provinces only 15% of the births will be unauthorized. (StudFP 33:105, 2002)

Here's an example of lax enforcement:

My student's Uncle and his neighbor's furniture.

In short, for most of the population, the ONE child policy was never consistently put into practice.

In addition, other branches of the Chinese government were instituting policies that had the opposite effect.

Age at Marriage SLIDE 8

# of first marriages SLIDE 9

Parity Progression ratios SLIDE 10

During the first decade of implementation of the 1 child policy (through 1988),

SLIDE 11

- 1) The TFR never fell below 2 for the country.
- 2) In rural areas, where most of the population is, it never fell below 2.5 Tien Pop Bull p11
- 3) less than 20% of eligible married couples had signed the one-child certificate - a contract which granted couples and their child economic and educational advantages in return for PROMISING not to have more than one child. Tien Pop Bull p11
- 4) Throughout the 1980s, nearly half of all reported births were 2nd, 3rd or higher order births. Tien Pop Bull p11
- 5) 80% of China's children had brothers and sisters. Many had both.  
Only 1/5 (60 million) of 300 million children under age of 14 were from single-child families.
- 6) In 1986 the population increase was almost 2 million (1.86M)  
more than was authorized in the plan. Aird Slaughter p65
- 7) In 1987 the # of abortions was half the # of live births.

Japan's percentage, at its peak in 1957, was half again as large:  
abortions were 72% of live births.

Weeks table 6.1

In short, there was rampant non-compliance (Dietrich, p328).

John Aird, the most forceful critic of the policy on human rights grounds, commented: "As long as such a great number of people ignore the law, what can the law do to them?" Slaughter p73: 1989

In the face of this lack of compliance by rural people, officials gave in.

In 1984 leadership changed in China and after only a couple of years of Draconian rules, they started back pedaling.

In 1984, the National Family Planning Commission declared: "In the countryside, couples will now be allowed to have a second child if the first was a girl".

Forced abortions were eliminated, at least officially

Mandatory IUD insertions were eliminated

Couples w/ 2 children were allowed to sign an agreement not to get pregnant rather than to be sterilized.

Financial penalties for exceeding the limit were eliminated

And a greater range of contraceptive options were provided.

However, after loosening the one-child policy, China's fertility rate drifted slowly downward. SLIDE 12

Finally, by 1992 - the TFR went below 2. (StudFP 33:106, table 2 2002) SLIDE 12b

In the end, China was not able to attain its goal of keeping its year 2,000 population under 1.2 Billion.

It failed by about 100 million people.

Pop is now over 1.3 Billion (World Pop 2008 Data Sheet)

But, because of momentum, China's population is expected to grow by another 100 million people from now (2008) to 2025. 2008 World Pop data Sheet

Hu Jintao, China's President, says the party plans to QUADRUPLE economic out put PER CAPITA in that time. NYT 10/16/07 pA8.

China's TFR is now is 1.6 (08 World Pop data Sheet)

By comparison, Countries of East Asia that never had a one-child policy have much lower birthrates. 2008 World Pop Data Sheet

China 1.6

Singapore 1.4

Japan 1.3

Taiwan 1.1

South Korea 1.3

Hong Kong 1.0

Macao 1.0

## GLOBALIZATION, US & CHINA.

Because of Globalization, China and the US are joined at the hip.

Shipping costs fell enormously with container cargo ships and the (previously) low price of oil. This allowed manufacturing jobs to go to low wage countries.

China was the largest and the government was organized and had the power to institute the structural basis for China to take over manufactures from the US.

Telecommunications meant that information and contact could flow instantaneously. That let knowledge based jobs out of the box to also follow low wages.

NYT 9/27/07, p1 General Motors compensates US workers with a combination of wages, health benefits, and pensions. Total hourly rate for GM Union Workers is \$80/hr.

Toyota's labor costs in the US are less than \$50/hr.

Most of your families earn a lot more than union workers at an auto plant.

China still has 500 million people living on less than \$2 per day.

There is little economic reason why US workers should earn \$80 an hour while Chinese are willing to work for \$2 a day.

There are a vast number of workers in China wanting to compete for our jobs.

With the current economic downturn, there are 10s of millions of Chinese being thrown out of jobs.

In addition, because of population increase, China's output must grow at a minimum of 8 percent for the economy to produce enough jobs to absorb increases in the working-age population.

It certainly won't do that in the current slump.

800 million Chinese are still peasants. Their average farm size is ~1/10 of an acre.

In Kansas (2002), the average farm size is 733 acres and 10% of the farms are over 2,000 acres. <http://www.ers.usda.gov/StateFacts/KS.htm>

In Kansas (2002) there were 76,238 farm workers for 47,227,944 acres

Or 1 farmer for every 620 acres. <http://www.ers.usda.gov/Data/FarmandRelatedEmployment/>

Totaling all farm related workers, there were 306,304.

Or one worker per 154 acres.

China must eventually compete in the world agricultural market.

That means combining its farms.

China has just started that process.

On their own, farmers have been forming cooperatives to buy machinery and farm their land together.

In October of last year, the Chinese government announced a land reform.

The plan allows farmers for the first time to lease or transfer their land-use rights. That's basically selling their land. Farms will combine.

As farms combine, people are moved off the land. If 1/10 acre farms are combined to 100 acres. That is a thousand to one reduction in the number of farms.

On these larger farms, fewer workers will be needed.

Assume, VERY conservatively that the need for agricultural laborers will drop by a factor of 4.

With 800 million peasants, that means that 600 million people will need new, non-farming jobs.

600 million people is twice the total US population.

In short – China will be an enormous source of low wage labor for a very long time.

And we will have to compete with them.

Whether we like the one-child policy or not,

It is probably the single most important factor in determining the future of the US economy.

#### CHINESE ACHIEVEMENT:

The Chinese have made an enormous achievement. Taking an extremely poor country out of more than a century of war and utter devastation into one of the first rank countries in the world.

This is a phenomenon that no-one would have thought possible.

With respect to population, China's fertility decline is also unparalleled.

Many areas of the world have now seen rapid fertility declines.

The rate of decrease of fertility is astounding:

Several countries have seen fertility drops of 1 child per woman each decade.

But even in this background, China stands out.

China's fertility drop was 2 1/2 times as fast.

The bulk of the fertility transition there took only 10 to 15 years.

From Feeney 1 child/decade to Chinese 2.4 /decade

HOW MUCH OF THE ECONOMIC ACHIEVEMENT IS DUE TO THE DROP IN FERTILITY. We will turn to that subject now.

China, an Engine of Growth, Faces a Global Slump NYT 10/22/08

Conventional wisdom holds that China's output must grow at a minimum of 8 percent for the economy to produce enough jobs to absorb increases in the working-age population, and many economists expect growth to drop below that level next year.

Just last week, thousands of unemployed workers protested outside closed toy factories in Guangdong Province, the country's export hub. Slightly more than half the country's toy exporters shut down in the first seven months of this year, mostly small companies that struggled to cope with new safety standards as well as weakening Western demand, according to China's customs agency.

Such steps are seen as crucial if China is to give consumers — especially working-class urban residents and the 800 million people still classified as peasants — the confidence to spend rather than increase their savings.

To date, the most significant new measure is the land reform announced last Sunday. Full details of the program are still unclear, but the plan allows farmers for the first time to lease or transfer their land-use rights, a landmark step in what is still nominally a socialist country. Economists say they believe that the measure will improve the rural economy, though few predict sudden benefits. To raise rural incomes more rapidly, the top Chinese economic planning agency on Monday raised the minimum purchase price of wheat by up to 15 percent beginning next year.

Today, China still has more than 500 million people living on less than \$2 a day; nationwide per capita income is only about \$2,000/yr

Many business people love population growth because it provides an ever larger market for their products.

If population growth is between 1 and 2 percent a year, as it is in the US.

And if the economy grows by 3 or so percent a year, as it does in the US,

Then population growth accounts for very roughly  $\frac{1}{2}$  of economic growth.

So business people don't want to forgo  $\frac{1}{2}$  of their profit growth.

That's great from the point of view of business profits,

But from the point of view of the individual person — he is interested in per capita income. How much an individual or his family make.

Population growth doesn't help per-capita income.

There may be more production, but there are more people to consume it.

No gain there.

There may be more jobs, but there are more people looking for jobs

No gain there.

So, to look at real economic benefit to a country, we are going to always look at per capita income.

Now let's consider a society where children go to school and there are laws preventing child labor.

From the point of view of an individual family —

If there are more children in a family — each one gets fewer resources.

Per capita income in the family declines.

That's straightforward.

## POP GROWTH AND ECONOMIC DEVELOPMENT

Remember, China instituted its population policy because they found that population growth was eating up most of its economic progress.

They wanted to improve the standard of living of their people.

In the 70s, when China started doing something serious about population

health care and education were still at very low levels –

So children were growing up unhealthy and uneducated.

Very explicitly, for the Chinese, standard of living included ‘Human Capital’

Health and education.

Western economists now agree that not only are health and education one of the best things one can do with economic gains –

But they are some of the best producers of economic gain.

Healthy, educated workers are just enormously more productive than sick or ignorant ones.

From Du, a local official in a small village:

NYT 10/28/00

One day there were hundreds of people lined up at the entrance of our village.

I thought it must be a vegetable market or a movie.

It turned out to be blood selling!

I felt so terrified because there was no sterilization equipment at all.

Villagers just tell the traffickers their blood type and then lie down on the ground to offer blood.

China has an AIDS epidemic because of this blood taking.

The same needle is used repeatedly to take blood from different people w/o sterilization.

Then the blood from many donors is pooled, then gamma globulin, clotting factor and some other components are extracted.

Even though blood selling is officially illegal,

black market blood is still used by drug manufacturers and hospitals.

The remaining blood in the pool is then returned to the donors.

If any ONE of the donors has HIV, all the other donors and all the patients may get infected.

Du continued: Villagers become crazy about selling blood because they are so poor and life is so hard. Many had built their houses by selling blood.

Some will even bribe traffickers to be able to sell more than once a day.

Official estimate is 600,000 HIV cases. Probably much more. NYT 7/11/03 editorial: “blood collections in the 90s, protected by corrupt officials, may have infected 1 million people in Henan Province alone, virtually all of them poor peasants who sold blood to make money.”

Not homosexual transmission. Drugs and prostitution. Road out of ChengDu with 5 miles of prostitutes (see AIDS in SW China file in PopCours '01 China Lec, 8/11/01 Sunday Times (London).

But, is cutting the birth rate an effective way to improve the economy?

Most economists thought NO.

The industrial revolution was thought to have made Malthusian ideas irrelevant.

A booming population increased market size and led to economies of scale.

Population growth was good for economies.

Then, in 1958, wrt the developing countries

Coale-Hoover hypothesis, 1958.

Why were 3d world countries doing so poorly.

The theory is based on some very basic economics:

Economic development requires investment.

Where does the money for investment come from?

The money for investments doesn't grow on trees.

It comes from money that someone has, but that he is not going to spend right away.

For every dollar invested, someone has to forgo consumption and put that money into savings.

That is money available for investment.

Investment depends on Savings

That's' the key to all of the following:

Now, what does a family do with its income?

It either spends it or saves it.

If there are a lot of children, the income has to go very heavily into supporting the children

So savings will be small.

So families either have big families and use their income for consumption,

or they have small families, save some of their income,

and those savings are invested and provide the capital for economic development of a country.

Presented in readings

This Coale-Hoover hypothesis had a big political effect.

Pop growth was bad for 3d world development.

If 3d world countries didn't develop, they would be ripe for Communist Revolution

So left wingers were in favor of family planning aid to the 3d world for humanitarian reasons - and right wingers were in favor of FP aid for anti-communist reasons.

There was a broad consensus of liberals and conservatives that the US should provide family planning aid both within America and to developing countries.

George Bush (the father) while he was a Congressman sponsored the first bill to provide money for domestic family planning and was in favor of foreign family planning aid also.

But then the scholars set about gathering empirical data to see if the Coale-Hoover hypothesis was correct.

They gathered data on pop growth and ec growth for the developing countries.

1. Here is a graph comparing Growth of per capita income with Pop Growth

Can you figure out the trend? Kelley p1701 (1988) from Simon SLIDE 110

There isn't any.

Lack of broad scale relationship between pop growth rate & ec. development.

(1970-1981)

1. The kind of data usually used to evaluate this question is very crude.

For instance, a low rate of population growth can result from a high birth rate and a high death rate. Or it can result from a low birth and death rate. So the graph puts countries that haven't started their demographic transition in the same place as countries who have completed their demographic transition.

2. These countries are all at such different states of development

And have such different individual situations that many, many confounding factors mask any effect of population growth that may be there.

Economic growth depends not only on population but on whether there are:

Wars, ethnic conflicts, dictatorships, etc.

Centralized control of the economy

Good or Bad Government policies

Etc., etc.

For example: Four countries did amazingly well in this 1970 to 1981 period.

The Asian Tigers: Hong Kong, Korea, Taiwan, Singapore.

These 2 cities, and 2 small countries, each have as much weight in the correlation as China or India.

All the Tigers had huge influxes of Foreign capital:

Hong Kong and Singapore: British and European Capital

Taiwan and Korea: US Capital.

It was this foreign capital that led to the fast economic growth, independent of their population growth. Spoils the correlation.

Hong Kong had a huge immigration from Mainland China.

So Hong Kong's population grew very fast - but it was adults who migrated in.

They formed a big pool of cheap labor: formed a basis for rapid economic growth

In this period they had very rapid population growth and very rapid economic growth. Again spoils the correlation, but for very special reasons that have nothing to do with the basic hypothesis that the correlation is meant to test.

Nevertheless, the economists couldn't produce data supporting the Coale-Hoover hypothesis.

Even though the data was fairly meaningless, some economists argued strongly that population growth was neutral with respect to economic growth.

This lack of a correlation had huge political impact in the US.

They said the US thus had no legitimate interest in population growth since it didn't seem to impact the well being of people.

Which economists identify with economic growth.

This was part of the cause for the Reagan policy of opposing US family planning aid. The US right wing is still wed to opposition to foreign aid for family planning.

Pres. Bush Jr.'s first official act in office was to cut down foreign aid for family planning.

It was couched as an anti-abortion measure - But in fact, it cuts off money for family planning. It cut off aid to all foreign programs that perform abortions or even counsel about abortions.

But it has always been illegal to use US money for abortions. There has never been a penny of US money spent for foreign abortions.

Almost all foreign agencies provide for safe abortions in addition to contraception; they know their women will get unsafe abortions if safe ones are unavailable. So the money that G. Bush cut off would have provided contraception which prevents abortions.

But, the hypothesis was so reasonable – even self-evident – economists kept researching.

To everyone's surprise, after several decades of not seeing an effect

In the most recent decade - an effect starts appearing.

Data from the more recent period shows such a relationship. 1980-1989

SLIDE 120

Each 1% drop in the population growth rate was associated with a 1.7% increase in income growth.

1.7% is a very big factor. In good years US income grows at like 3.5%

about 2% less population growth can make all the difference between

No Growth and High growth

But: correlation does not imply causation.

Which way does the causality run?

Does reducing population growth allow a country to grow economically

OR

Is the reverse the case:

Improved economic conditions lead to reduced fertility.

Argument: Bucharest Conference:

Ec Development is the Best Contraceptive:

Evidence against

SLIDE 3

Countries w/ fast economic growth did NOT have slower population growth rates.

BUT, later, it was found that Countries which had slow pop growth in 1965 to 80 increased their per capita income

SLIDE 4

While countries with fast population growth had negative growth.

Their economies shrank on a per capita basis

This graph shows the effect of pop growth in 1965 to 1980 on those years

A tiny effect

And the effect of 1965 to 1980 pop growth 15 years later.

A big effect.

This last comparison is NOT 1980-89 pop growth on ec growth in the same years.

This relates pop growth in 65-80 to ec growth 15 years later!

Now this is a very interesting phenomenon.

We saw no correlation of pop growth and ec growth from 1965 to 1980

But 10 to 20 years later, a clear correlation appears.

What's going on?

The beneficial effect of slowed population growth seems to be delayed by 15 years. Remember, the original Coale-Hoover hypothesis focused on dependency burden.

Income could either go into supporting a lot of children

Or into savings that would be invested and provide the capital for economic development.

But the empirical work focussed on population growth in one year and economic growth in that same year. It didn't take into account the fact that children, once born, are dependent for 15 or so years, and then become workers.

Imagine the fertility decline happening all at once.

Fertility has been high. There is a large cohort of kids already born.

Then the fertility decline happens. Afterwards there are very few kids.

The large # of already born kids are dependents for the next 15 years.

During this 15 years, the dependency ratio is bad: lots of kids per adult.

15 years later, this large # of kids grows up and becomes workers.

But now they have only a few kids to support.

The dependency ratio turns favorable. Few kids per adult.

The economy takes off.

Of course, the fertility decline doesn't happen all at once.

But the story is the same, it just doesn't happen so suddenly.

Well, when a country goes through a steep demographic transition,

Like East Asia did, there is a time when there are few new children born,

but the already born children are still growing up.

It takes about 15 years for the last cohort of children born in a high fertility period to grow up and become workers.

BORROW SLIDES FROM DAVID BLOOM

So there is a delay between the time that fertility falls and the time that the number of children decreases and the number of workers increases.

% working & dem transition, Bloom & Williamson, PDR SLIDE 5

The population eventually goes through a period where the proportion that is in working age becomes large - and that is the period of low dependency burden.

That is the time when a country can make great economic progress.

Here is a comparison of the dependency burden in Africa and East Asia.

East Asia reduced its fertility and got a huge burst of workers 15 or 20 years later.

And experienced a huge economic boom.

Bloom & Sachs p245 OVERHEAD 1

Africa has not reduced its fertility; it has not had an economic boom.

One can also compare Asia with the west.

In the west it got up to 26% during our 'baby boom'.

In Pakistan and Bangladesh it was twice that: 46%.

The youth dependency burden (<14 yrs) was much higher in Asia in the 1960s than it had been in the west

In countries where half the people are dependents, workers have to spend every penny just to support these dependents. They do very poorly economically.

During the height of the population explosion,

Asia was in much worse economic shape than Europe had been in for centuries.

When fertility dropped, and the dependency burden came down to Western levels, the East Asian countries took off economically.

Here is the data for Asia:

Column 3 shows % of population that was dependent, i.e. under age 14.

Top # for each country is the peak #, at height of that country's pop explosion.

In the 1960s or 1970s

At the peak for each country, the # of children was 40% or more of the population. (except in Japan). Higgins & Williamson PDR Table 1 SLIDE 6

Can ignore oldsters for the moment - they were only 3% or 4%

The lower # for each country is data from the boom period 1990-92.

Look at the countries which have gotten their dependency rates down into the 20s:

They are all the economic miracle countries.

Table 1. same SLIDE 6

Look at the countries which are still in the 40% range:

All are the economic basket cases.

In fact the East Asian countries did make great economic progress as their dependency burden decreased.

So we all know that East Asia went through an economic miracle.

How much of the miracle was due to the demographic effect?

This is very new stuff, and still argued over, but Economists have put all the data into their computer models and these models attribute 1/3 to 1/2 of the Asian Economic miracle to this dependency burden effect.

So one possible conclusion from these studies is that contraception is the best impetus to economic growth.

If a country wants to jump start its economic engine, the best thing to do is probably to foster the use of contraceptives.

This hypothesis looks like it also applies to the US.

Prof. John Geanakopolous of our Ec Dep't just published a study showing that the price to earnings ratio of the 500 largest US corporations mirrors the dependency ratio. For the US, the dependent ages are young adults (that's you) who are big consumers vs middle aged people who do the work and are the savers.

They argue that "demographics are the most important factor in determining long term stock market trends." NYT 12/1/02

Quite interesting that these economic studies don't consider gender in their calculations of dependency burden. If women are not working (in some formal or quantifiable sector) they are dependents. When women start to work there is a potential doubling of the work force. This changes dependency ratio drastically. Usually at the same time that fertility drops women's participation in the work force increases. This should also have a big effect on the dependency ratio.

Many economists now see the education of women as a crucial condition of growth in developing nations (NY Rev of Books 5/31/01 Madrick)

This effect has been termed the "DEMOGRAPHIC GIFT"

Calling it a gift implies that it comes as a free companion to the fertility transition.

To be more professional, it is now called the Demographic Dividend"

Also, you don't get gifts very often.

A country can go through a fertility transition only once.

So each country gets this demographic gift only once.

Now, it's not guaranteed that a country will use it's demographic gift wisely.

I showed you in an early lecture the story of Algeria a country that is going through its demographic gift period now -

But is losing it in a war with religious fundamentalists.

Same w/ Egypt and many of the Arab countries, that may lose the demographic gift because they put all their resources into the conflict with Israel.

If a country goes through a demographic transition, its working age population will increase. If the workers can be productively employed, the country will go through a boom.

If there are not enough jobs for the workers, then wages may fall drastically,

and the country may be worse off than before.

It's not at all understood what leads to the availability of jobs to accommodate the new workers.

People are watching South Asia intently.

South Asia has started its fertility transition.

Will it be able to utilize its gift the way East Asia has?

Stay tuned - no-one knows.

So, again, as I emphasized for Algeria, countries go through their demographic transition once.

It is a window of opportunity to modernize.

If it is not used - the opportunity may never come again.

What I'm going to say next has a lot of relevance for another hot public issue.

This is globalization and the World Trade Organization and all that.

The WTO is the body that coordinates the globalization of trade.  
You remember that the WTO met in Seattle last year,  
There were lots of protesters and some pretty violent riots erupted.  
Now, the demographic story of economic development I've been telling you  
is a very different story than you read in the American newspapers.

The standard story is that a developing country can get rich by

- 1) Opening it's markets
- 2) Getting lots of Foreign Capital

But, if you look at the data, East Asia

SLIDE 7

Savings starts low – then goes up by a factor of 2.5.

Investment goes up by 70%.

The difference between savings and investment is foreign capital:

It starts high – but falls rapidly as fertility goes down

And then at the time of the boom, East Asia is exporting capital.

South Asia, on the other hand

Savings start HIGHER than East Asia, but during the population explosion

Savings fell by 60%.

A lot of foreign capital came in –

A greater percentage increase in investment than East Asia.

But it didn't do much good because it was eaten up by population growth.

South East Asia - is intermediate.

So the conclusion is: if a country gets its fertility down - it can generate its own capital and does not need to depend on foreign sources and foreign control.

So the standard advice to developing countries is:

Open your markets and you'll get lots of foreign capital

The alternative advice is:

Open your family planning clinics and you'll generate your own capital!

## AGING POPULATIONS

The third phase of the demographic transition is characterized by a rapid increase of the elderly population.

The working age population ages and eventually becomes a burden again.

After people retire, they are not working and so act as a drain on the economy.

Japan has passed the peak of its demographic gift,

It has an increasing proportion of oldsters and its economic productivity is coming down.

The advanced countries of Europe and Japan are worried about this.

One solution is that these countries should have more children.

The basic argument is that we should produce more children so that when they grow up they can work for old people.

The basic idea is that the value of people is their labor.

The ethical implications of that reason is horrendous.

It is very similar to the argument from poor developing countries

That people need to have many children so that they can support the oldsters.

It's a variant of the argument for child labor.

It's a stupid idea: keeping the population increasing longer just puts off the day of reckoning. It's just like politicians (and citizens) saying, I don't want to pay taxes now = let's just borrow the money and my children will have to pay it off.

Traditionally, dependency is from 0 to 15 years of age, and then again from over 65.

At the penultimate stage of the demographic transition, there are fewer children - and more oldsters.

Sometimes, these two changes more or less cancel out. At the end of the demographic transition, the total dependency ratio can be similar to the level that existed before the demographic transition began - just with the opposite mix of young and old dependents. PDR Supp 2000 p1.

Eventually, if the birthrate stabilizes at ~2 children, the population pyramid becomes rectangular: there are approx equal numbers of people at all ages (except the very old).

Even if one just looks at young people - the problem doesn't appear. The number of young people is decreasing, but as the number of years of education they need gets longer, the person years of dependency doesn't change that much.

THE MAJOR FACTORS ARE:

1. People start to work when they are older

Education is increasing all around the world.

More education is needed to do the kind of jobs that a modern economy entails.

Everybody needs now to be literate.

Even farmers need a lot of education to understand how much fertilizer, and of what kind, how much pesticide, and of what kind. How to mix these up. Which kind of seed to buy, etc, whether to sell the crop before it's harvested. (futures) Etc., etc,

To compete in the technological world, education is needed for even basic jobs.

In developing countries, the new jobs are almost all in the technological sector.

To compete for decent jobs in an advanced country like the US you need at least a BA and a MBA, or MD or LLB.

## 2. People are retiring earlier

OVERHEAD

Data on changes in # of years worked (US) Pop Today May/June 2002. (Table 3 in PDR 27 pg8) SLIDE 8

Europe: average retirement ages have been dropping by about a year per decade.

[www.cia.gov/nic/speeches/index](http://www.cia.gov/nic/speeches/index) Nat'l Security Implications of Global Demographic Change p3

Germans retire between 55 and 60 because of "work related stress"

France: Average Age of Retirement is 59. French workers have shut down the country in recent years demanding earlier retirement.

Compare the fraction of men aged 55 to 64 who are still working:

US: 1970 81%, 1995 68% country lost 13% of this workforce

New Zealand about the same: 79% to 66% 1/3 of men are already retired.

Other places are really severe: Italy: 59% to 45%

Netherlands: 81% to 42%.

Over 1/2 this workforce is already retired.

Chinese employment laws dictate that men must retire at 55 and women at 60 if they are working for a formal sector employer or for the government. The Chinese Government set these age limits because so few jobs are available.

Donald J. Adamchak "The Effects of Age Structure and Retirement in China"

The Social Science Journal 38 1/1/01

## 3. At the old age end, people are living longer.

If retirement age stays the same, this drastically increases the number of years that they have to be supported by the working population.

This last is an important economic fact that needs understanding.

Some people misunderstand the economics of retirement.

They say, I'm not a burden on society. I'm living off my pension and my savings.

No- your pension has to be paid by those still working.

If you disinvest from your savings - that money can only come if someone else buys your stocks or whatever your savings are invested in. So in either case - the money you are living off must come out of someone else's pocket.

The proper way to think about it is that all the goods and services that a retired person uses - have to be produced by someone currently working. So the labor of working people is being consumed by retirees.

The ratio of workers to consumers is what matters.

Capital goods (like houses) that last from one generation to the next are an exception.

In the US, the age of retirement declined by 3 yrs from 1950 to 1990s.

The # of years of retirement rose from 12 to 18 years.

This means that they have a shorter worklife to accumulate money for longer retirement.

Men Working life changed from men working 3 1/3 yrs of work for each retirement year to 2 working 2 years for each retirement year.

This means that 2 people still working must support 1 retired person.

1/3 of the working person's productivity goes to support non-working persons.

4. Women are kept out of the workforce or underutilized in many countries.

Japan has the most extreme case in the world of old age dependency burden.

But it also one of the most difficult places among developed countries for a woman to get a good job. New female college graduates being offered only secretarial jobs.

Adding it together:

a). Combine a later age when people start to work, and an earlier age when they retire

and the number of years an individual works is considerably less.

b). Combine the much longer period when children and young adults are in school and hence dependent -

With the much longer period in retirement when people are again consuming but not producing.

And the number of years that someone is a dependent is much larger.

Combine fewer work years and more dependent years

And you have a big shift in the dependency burden.

Notice that none of these major factors causing the dependency burden has to do with the birth rate.

These factors are much more important in the dependency burden problem than is the slowly declining birth rate in developed countries.

The old age dependency burden is not caused primarily by a lowered birth rate!

FIXES

Now there are 3 standard fixes for this:

Raise the birth rate

Take in immigrants

Raise the retirement age

People who advocate an increased birth rate to fix the dependency burden are trying to cure the problems above with increased fertility. The birth rate would have to increase enormously for to compensate for our longer period of education, our shorter period of working, and our longer period of retirement.

And the birth rate would have to increase permanently. If we ever returned to replacement level fertility the problem would just reappear.

Lets see what happens if the birth rate increases. For the first 20 -25 years, all the excess births are dependents - so that worsens the problem. Then there is a period of 35 to 40 years when the first increased cohort of children comes of working age. After that, these children start to retire - and become a burden again. Raising the birthrate just delays the day of reckoning.

So a one time rise in the birth rate is a temporary solution. For the fix to be permanent, the birth rate has to stay considerably over 2 forever. That implies a human population that grows rapidly forever.

BAD IDEA

Solution 2: Taking in immigrants is extraordinarily controversial. The countries that may want to take in immigrants are generally the richest. The countries that immigrants want to leave are generally the poorest.

When these 2 groups meet in an immigrant situation, this can lead to huge social discord. Europe has been politically pulled apart by its immigrant question.

Immigration - legal and illegal - is one of the major hidden political issues in the US.

Racism and/or cultural chauvinism and immigration

Many mainland Chinese want to emigrate to the higher standard of living in Hong Kong. To keep itself from being overwhelmed, Hong Kong has strict laws prohibiting immigration by mainlanders.

But, the Gov't has just announced a pro-natalist policy. It want Hong Kongese to increase their birthrate. Apparently the Gov't. prefers HK born babies to mainlanders of working age.

The third solution, later retirement is the obvious one.

People are living longer and healthier. They are rarely too sick to work at age 60 or 65. Jobs are becoming less labor intensive and more interesting. Older workers are often more skilled, mature and stable than younger workers. They often better workers than younger ones.

But raising the retirement, or social security age, is a major political problem. Oldsters have tremendous political power. They vote in high percentages - and they vote selfishly. They react violently to any benefit being reduced or taken away from them. See pg 33 of CIA doc

IN SUMMARY, THE DEPENDENCY BURDEN PROBLEM IS CAUSED BY IMPROVEMENTS IN EDUCATION THAT INCREASES DEPENDENCY IN THE YOUNG YEARS, RISES IN WORKER INCOME AND BENEFITS THAT HAVE ALLOWED EARLIER RETIREMENT, AND IMPROVEMENT IN HEALTH THAT INCREASES DEPENDENCY AT THE OLD AGE END.

SOLVING THE DEPENDENCY PROBLEM BY RAISING THE BIRTH RATE IS NOT A RATIONAL, ETHICAL OR EFFECTIVE SOLUTION. It just delays the day of reckoning.