

## Chapter 15

# Macroeconomic Challenges for the 21<sup>st</sup> Century

*Macroeconomics In Context (Goodwin, et al.)*

### Chapter Overview

This chapter examines two major issues for the 21<sup>st</sup> century: (1) human development, both in poor and rich countries, and (2) ecological challenges, particularly (but not exclusively) global climate change. The chapter discusses the relationship between economic development and human development, and examines the Millennium Development Goals for enhancing human development. The chapter also discusses the relationship between economic growth and the environment, and the standard theories regarding this relationship, such as the Environmental Kuznets Curve. The chapter raises serious challenges to the belief that economic growth and markets, on their own, will solve the social and environmental problems of the coming century, and highlights several policies to promote sustainable development.

### Chapter Objectives

After reading and reviewing this chapter, you should be able to:

1. Identify human development and ecological sustainability as major economic issues for the 21<sup>st</sup> century.
2. Discuss the relationship between economic development and human development.
3. Understand the development goals set by international institutions, and the likelihood of their being met.
4. Identify major environmental challenges.
5. Discuss the relationship between economic growth and the environment.
6. Describe several policies directed towards sustainable development.

### Key Terms

capabilities  
human development  
Millennium Development Goals (MDGs)  
social discount rate

*Appendix Key Terms:*  
birth rate  
fertility rate  
death rate  
mortality rate  
replacement fertility rate  
population momentum  
demographic transition  
net migration rate  
old-age dependency ratio

## Active Review

### *Fill in the Blank*

1. The approach that concerns itself with the opportunities that people have to pursue well-being, such as being well nourished, decently housed, and to participate in society is called the \_\_\_\_\_ approach.
2. The process of creating an environment that expands people's choices, allowing people to develop their full potential and lead productive, creative lives in accord with their needs and interests, is the definition of \_\_\_\_\_ as established by the UNDP.
3. In September 2000, the United Nations member nations declared a set of goals (each with certain targets) to make progress by 2015 in the areas of poverty alleviation, education, gender equity, health, environmental sustainability, and partnerships in development. These goals are known as the \_\_\_\_\_.
4. The \_\_\_\_\_ curve posits an inverted U-shaped relationship between economic development and environmental damages, suggesting that as nations develop their damage to the environment decreases.
5. Taxes that are used as a means to internalize the negative externalities from pollution are called \_\_\_\_\_.
6. A discount rate that reflects social rather than market valuation of future costs and benefits, and is usually lower than the market discount rate, is called a \_\_\_\_\_.
7. (Appendix) The annual number of births per 1,000 people is the \_\_\_\_\_ rate, whereas the average number of births per woman of reproductive age in the population is the \_\_\_\_\_ rate.
8. (Appendix) The annual number of deaths per 1,000 people is the \_\_\_\_\_ rate, whereas the average number of deaths among a specific group is the \_\_\_\_\_ rate.
9. (Appendix) The fertility rate required in order for each generation to be replaced by a next generation of the same size (which is an average of 2.1 children per woman in industrialized countries) is the \_\_\_\_\_.
10. (Appendix) The change over time from a combination of high birth and death rates to a combination of low birth and death rates is called the \_\_\_\_\_.

*True or False*

11. Human development is about meeting basic needs for food, shelter, and health care.
12. The world population in 2000 was already 6 billion, and the United Nations low and medium range projections show global population of between 7.7 and 9.2 billion people in 2050.
13. According to leading scientists, global emissions of greenhouse gases will eventually need to be reduced significantly—up to 80 or 90 percent lower than current levels by 2050—if we are to avoid the most dangerous effects of climate change.
14. One of the limitations of green taxes is that they are regressive, likely falling disproportionately on lower-income households.
15. Only economic development can raise well-being, both in terms of human development and environmental sustainability.
16. (Appendix) A population can continue to grow, in spite of having a fertility rate at or below replacement, if a large proportion of its members are of childbearing age.

*Short Answer*

17. What is the relationship between economic development and the human development indicator of life expectancy? Is there a clear relationship for both the low income countries and the middle income countries?
18. Where do resources spent in boosting life expectancies appear to be more successful – in high income countries, or low income countries?
19. What kinds of problems have emerged in affluent societies in which having “too much” may itself be a problem?
20. One of the Millennium Development Goals is fostering “a global partnership for development.” Explain what this entails.
21. Are the Millennium Development Goals likely to be met by 2015?

22. Identify three environmental issues that are closely related to economic growth.
  
23. What kinds of environmental problems are associated with the increasing global human population?
  
24. What are some of the problems predicted to occur with rising levels of greenhouse gas emissions?
  
25. What is the Environmental Kuznets Curve (EKC) hypothesis? And what is the evidence for this hypothesis?
  
26. Identify at least four policies for sustainable development.

### **Problems**

1. Given the following Human Development data:

	GDP per capita (PPP, US\$, 2005)	Adult Literacy rate (% aged 15 and older)
U.S.	\$41,890	99
Norway	41,420	99
Russian Federation	10,845	99
South Africa	11,110	82.4
Mexico	10,751	91.6
China	6,757	90.9
India	3,452	61
Nigeria	1,128	69.1
Congo, Dem. Rep.	714	67.2

Source: UNDP, 2007/08



4. Which of the following best describes the relationship between average income (GDP per capita) and average life expectancy, across countries?
- There seems to be a clear relationship at all income levels.
  - There seems to be a clear relationship at low income levels, but the relationship is less clear at middle and high incomes.
  - At middle incomes there seems to be a clear relationship, but the relationship is less clear at low and high incomes.
  - At high incomes, there seems to be a clear relationship, but the relationship is less clear at low and middle incomes.
  - There seems to be no relationship for any range of income.
5. Which of the following statements is false?
- For low income countries, an increase in income results in significant increases in life expectancy.
  - Some middle income countries like Mexico have high life expectancies close to the high income countries, yet per capita incomes that are not even half as high.
  - Some middle income countries like South Africa and the Russian Federation have moderate per capita incomes, yet life expectancies that are surprisingly low.
  - Increases in incomes in the high income countries translates into very little increases in already high life expectancy rates.
  - Comparing any two countries, the one with a higher per capita income will have a longer average life expectancy than the country with lower per capita income.
6. Which of the following is *not* one of the Millennium Development Goals?
- Eradicating extreme poverty and hunger
  - Combating HIV/AIDS, malaria and other diseases
  - Promoting gender equality
  - Promoting international security through weapons buildup
  - Ensuring environmental sustainability
7. Which of the following resources are currently being depleted or at risk of depletion?
- Fisheries
  - Forests
  - Clean water for drinking and agriculture
  - Minerals and fossil fuels
  - All of the above.

8. Which of the following are *not* among the adverse effects of greenhouse gas emissions?
- Rising temperatures.
  - Rising sea-levels.
  - Ecological disruptions such as species extinction.
  - Increased frequency of severe weather events such as hurricanes, floods, and droughts.
  - Over-use and depletion of fossil fuels.
9. The Intergovernmental Panel on Climate Change (IPCC) in a 2001 report predicts a rise in global average temperatures by 2100 of:
- Between 1 degree Celsius (low estimate), to 2 degrees Celsius (medium estimate), to 3 degrees Celsius (high estimate).
  - Between 1.4 degrees Celsius (low estimate) to 2.8 degrees Celsius (medium estimate), to 5.8 degrees Celsius (high estimate).
  - Between 2 degrees Celsius (low estimate), to 5 degrees Celsius (medium estimate), to 10 degrees Celsius (high estimate).
  - They claim the uncertainties of climate change make such predictions impossible.
  - None of the above.
10. According to the IPCC in a 2001 report, which of the following are likely effects of only a 2°Celsius increase in global average temperature?
- A 20–30 percent decrease in water supplies in already vulnerable regions such as Southern Africa and the Mediterranean.
  - 15–40 percent of species possibly facing extinction
  - 40–60 million more people exposed to malaria in Africa.
  - Up to 10 million more people affected by coastal flooding each year, with major low-lying areas swamped and coastal cities endangered.
  - All of the above.
11. Which of the following was the conclusion of the 2006 British government report written by former World Bank chief economist Nicholas Stern?
- The costs of climate change in the twenty-first century are estimated as equivalent to 5–20 percent of global GDP, while the most severe effects of climate change could be avoided at a cost of around only 1 percent of global GDP.
  - The costs of climate change in the twenty-first century are estimated as equivalent to 1 percent of global GDP, while the most severe effects of climate change could only be avoided at a cost of around 5 - 20 percent of global GDP.
  - It now appears that the costs of current actions to minimize climate change significantly exceed the benefits.
  - B and C
  - None of the above.

12. If nothing is done now to stem the effects of climate change, what group will face the most dangerous impacts from climate change?

- a. Current generations
- b. Future generations living several decades from now
- c. Developed countries
- d. Developing countries
- e. B and D

13. Why do some researchers suggest that when economic development increases, environmental damage (per capita) will decrease?

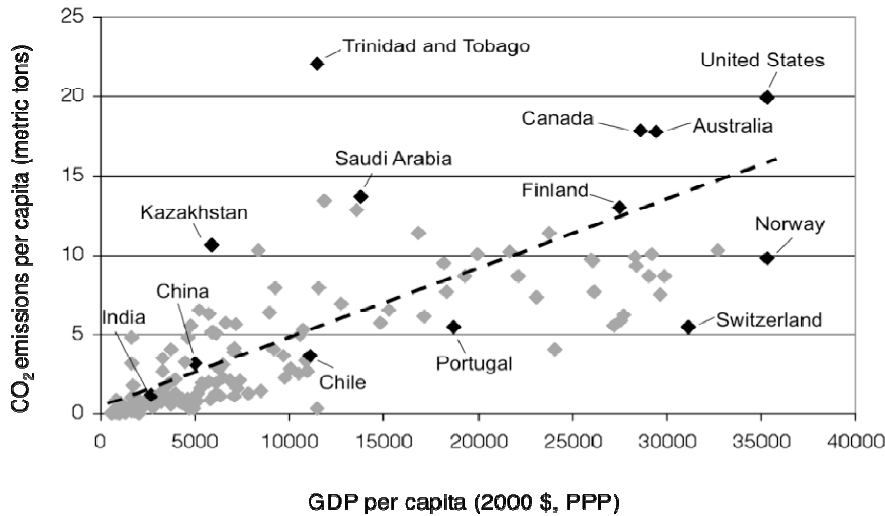
- a. Because the greater availability of wealth and technology allows nations to adopt cleaner production methods.
- b. Because as countries develop, they move to a service-based economy which does less harm to the environment.
- c. Because as people become wealthier, they demand higher environmental quality standards.
- d. All of the above.
- e. None of the above.

14. The Environmental Kuznets Curve (EKC) hypothesis posits that:

- a. Environmental damage per capita increases in the early stages of economic development, reaches a maximum, and then diminishes as a nation attains higher levels of income.
- b. Environmental damage per capita falls in the early stages of economic development, reaches a minimum, and then rises as a nation attains higher levels of income.
- c. Environmental damage per capita steadily rises during all stages of economic development.
- d. Environmental damage per capita steadily falls during all stages of economic development.
- e. There is no clear relationship between environmental damage per capita and economic development, as it depends on the country, the pollutant, and other contingencies.

15. The evidence for the Environmental Kuznets Curve (EKC) suggests that:
- The EKC relationship does seem to hold for all pollutants.
  - The EKC relationship does not seem to hold for any pollutants.
  - The EKC relationship does seem to hold for some pollutants, such as per capita sulfur dioxide emissions and other air pollutants, but not for the environmental impacts of municipal waste, energy use, and CO<sub>2</sub> emissions.
  - The EKC relationship does seem to hold for the environmental impacts of municipal waste, energy use, and CO<sub>2</sub> emissions, but not for per capita sulfur dioxide emissions and other air pollutants.
  - The EKC relationship does seem to hold for some countries, but not others.

For the following question, refer to the figure below.



16. The figure above, showing the relationship between GDP per capita and CO<sub>2</sub> emissions:
- Suggests that countries with higher incomes have the wealth and technology to implement less polluting production methods.
  - Suggests that countries with higher incomes have moved to service-based economies with lower pollution levels.
  - Provides evidence that confirms the Environmental Kuznets Curve hypothesis.
  - Provides evidence that does not support the Environmental Kuznets Curve hypothesis.
  - None of the above.

17. Which of the following does *not* describe the textbook authors' view on the relationship of poverty and the environment?
- a. When addressing sustainable development, it is imperative to also reduce poverty and economic inequality.
  - b. Eliminating poverty can provide people with choices that are less destructive of the environment, thereby helping the environment.
  - c. Environmental degradation usually hits the poorest people hardest, so improving the environment can also help to reduce poverty.
  - d. A concern for the environment takes away attention from addressing issues of poverty.
  - e. All of the above.
18. Which of the following is *not* a policy to promote environmental sustainability?
- a. Green taxes and tradable pollution permits.
  - b. Grants, subsidies and tax breaks to support recycling, renewable energy, and efficient transportation systems.
  - c. Tax cuts to stimulate consumption spending.
  - d. Elimination of subsidies for environmental degrading activities.
  - e. Debt for nature swaps.
19. What are the conclusions drawn by Alan Durning in *How Much is Enough?*
- a. The impact on environmental problems of the global lower-income class is relatively minor.
  - b. The global middle class leads the most environmentally sustainable lifestyle.
  - c. The global upper income class leads to most environmentally unsustainable lifestyle.
  - d. Each group must approach environmental sustainability with different objectives.
  - e. All of the above.
20. Which of the following applies to how macroeconomic theory could deal with environmental considerations?
- a. Target both the level and composition of consumption spending.
  - b. Promote forms of investment that do not increase the "throughput" of natural resources and the creation of wastes.
  - c. Direct government spending towards promoting environmental sustainability.
  - d. Promote investments that are more future-oriented than those concerned with short-term considerations.
  - e. All of the above.

21. (Appendix) Which of the following is *not* one of the 5 stages of the demographic transition?

- a. Both birth and death rates are high.
- b. Death rates are reduced, while birth rates stay high.
- c. Death rates decline, but are still higher than birth rates.
- d. Birth rates and death rates equalize at a low rate.
- e. Birth rates are lower than death rates.

22. (Appendix) In what stage of the demographic transition are the industrialized countries of the world?

- a. In the first stage.
- b. In the second stage.
- c. In the third or fourth stage.
- d. In the fifth stage.
- e. They have passed through the fifth stage.

23. (Appendix) What type of policies are international organizations primarily advocating to lower population rates in developing countries?

- a. Reducing birth rates.
- b. Reducing fertility rates.
- c. Raising death rates.
- d. Raising mortality rates.
- e. None of the above.

24. (Appendix) Which of the following trends about global population is false?

- a. Even though China has put downward pressure on population with its one-child policy and had a fertility rate estimated at 1.73 in 2006, its population is still growing due to population momentum (the large number of women in childbearing years).
- b. China is expected to displace India as the world's most populous country within the next fifty years.
- c. Some countries, such as Italy, German and Japan, are now experiencing population declines.
- d. Sub-Saharan Africa has had some of the world's highest fertility rates in modern times, but increased mortality rates due to the HIV/AIDS pandemic.
- e. World population is forecasted to rise from its current level of 6.5 billion to between 7.7 billion and 10.6 billion by 2050.

25. (Appendix) Which of the following characterizes the forecasted U.S. population pyramid for 2050?
- Triangular, due to the steady birth rates and steady death rates among older persons.
  - Triangular, due to the baby boom of the post WWII years.
  - House-shaped, due to the unusually high proportion of the population who are in their prime working years.
  - Rectangular, due to the rising proportion of the population who are in their retirement years.
  - An inverted triangle, due to the rising proportion of the population who are in their retirement years.
26. (Appendix) Which of the following are macroeconomic considerations from higher old-age dependency ratios in upcoming years?
- There may be pressure for people to start work earlier in life, retire later, or work more intensely than they have in the past.
  - There may be a further sectoral shift toward service-sector employment.
  - National savings may become depressed, squeezing the funds available for investment spending.
  - Strains on public finances may lead to higher taxes and/or lower benefits, or cuts in areas other than social services and medical care for the elderly.
  - All of the above.

### **Answers to Active Review Questions**

- capabilities
- human development
- Millennium Development Goals (MDGs)
- Environmental Kuznets (Curve)
- green taxes
- social discount rate
- (Appendix) birth (rate), fertility (rate)
- (Appendix) death (rate), mortality (rate)
- (Appendix) replacement fertility rate
- (Appendix) demographic transition
- False. It is also about participation in society and having the opportunity to lead a meaningful life.
- True.
- True.
- True.
- False. The relationship between economic development and both human development and environmental sustainability is not clear-cut. In some cases, increases

in GDP per capita leads to little increase in well-being, and leads to decreases in some areas of environmental quality.

16. (Appendix) True.

17. For low income countries, there does appear to be a relationship that higher levels of economic development (measured as GDP per capita) does correspond to higher rates of life expectancy. For the middle income countries the relationship is less clear, since some countries (such as Mexico) have been able to achieve life expectancies comparable to the high income countries, but with a lower level of GDP per capita. And other countries with medium levels of GDP per capita (such as South Africa and the Russian Federation) have surprisingly low life expectancies.

18. It appears that resources spent in low-income countries (in basic provisioning of foodstuffs, health, clean water) have a much greater impact on raising life expectancy. The gains in life expectancy in high income countries are quite small.

19. Problems include overconsumption and overstimulation, such as obesity, as well as spiritual malaise and dissatisfaction when not being able to “keep up with the Joneses”.

20. This entails: eliminating tariff barriers to poor countries’ products, canceling and/or restructuring debts, increasing foreign aid (to at least 0.7% of GNI), easing the flow of essential drugs, and sharing technology.

21. Some of the goals may be met (e.g. halving the proportion of people in developing countries living on less than \$1/day), but the goals regarding hunger, child and maternal health, sanitation, and gender equity are not likely to be met.

22. Global population, resource depletion, and pollution and wastes.

23. The increasing global human population necessitates increasing food supplies, which has led to environmental problems such as: land degradation, pollution from fertilizers and pesticides, and overdraft of water supplies.

24. The problems include: Rising temperatures (between 1.4 – 5.8 degrees Celsius), rising sea-levels and coastal flooding, decrease in water supplies, declines in crop yields, ecological disruptions such as species extinction, spread of malaria and other tropical diseases, and increased frequency of severe weather events such as hurricanes, floods, and droughts.

25. The Environmental Kuznets Curve (EKC) Hypothesis says that environmental damage per capita increases in the early stages of economic development, reaches a maximum, and then diminishes as a nation attains higher levels of income. The EKC relationship does seem to hold for some pollutants, such as per capita sulfur dioxide emissions and other air pollutants, but not for the environmental impacts of municipal waste, energy use, and CO<sub>2</sub> emissions.

26. Green taxes and tradable pollution permits; Grants, subsidies and tax breaks to support recycling, renewable energy, and efficient transportation systems; Elimination of subsidies for environmental degrading activities; Debt for nature swaps.

## Answers to Problems

1.

a.



b. There is only a rough correspondence between GDP per capita and adult literacy rates. In general, countries with lower GDP per capita have lower adult literacy rates. However, countries with very different levels of GDP per capita (such as the Russian Federation, Mexico, and China on the one hand, and Norway and the U.S. on the other) have fairly similar adult literacy rates.

## Answers to Self Test Questions

- |       |       |
|-------|-------|
| 1. D  | 11. A |
| 2. B  | 12. E |
| 3. C  | 13. D |
| 4. B  | 14. A |
| 5. E  | 15. C |
| 6. D  | 16. D |
| 7. E  | 17. D |
| 8. E  | 18. C |
| 9. B  | 19. E |
| 10. E | 20. E |

*In Appendix*

- |       |       |
|-------|-------|
| 21. C | 24. B |
| 22. C | 25. D |
| 23. B | 26. E |