

Chapter 2

Measuring the Macroeconomy and Human Happiness

The welfare of a nation can ...scarcely be inferred from a measure of national income.

Simon Kuznets (1934)

FOR A NUMBER OF YEARS NOW The United Nations has issued a *World Happiness Report* that ranks the World's countries by how happy and satisfied with life its citizens claim to be. The rankings are based on the results of surveys that directly ask citizens to assess their satisfaction with life in their respective countries. In 2020, Finland ranked as the happiest country, the third straight year it headed the list. Does this highest level of happiness also imply that Finland's economy is the best-performing economy in the world? According to data shown in Table 2.1 on the right, when we look at the measure called **Gross Domestic Product**, or GDP, the people of Luxembourg are, on average, the richest on the planet. But, according to the United Nations happiness rankings shown in Table 2.2, Luxembourg is only the tenth-happiest country. Why is Finland so happy when average per capita income is only the 14th-highest?

There are many discrepancies between Tables 2.1 and 2.2. For example, the United States has the fifth-highest GDP per capita, but in terms of happiness it is ranked 18th. And, Qatar, the ninth-richest country is not even among the top 25 happiest countries.

No doubt, you can think of many reasons why the dollar value of average national production and the level of happiness do not exactly match. Think of the popular saying: "Money cannot buy happiness." That is probably true. On the other hand, these measures of happiness and production may simply not be very accurate. This chapter examines measures of human well-being and economic performance that economists and policymakers use to assess our economy and to judge the effectiveness of macroeconomic policies.

Rank ↕	Country/Territory ↕	US\$ ↕
1	 Luxembourg	109,602
2	 Switzerland	81,867
3	 Ireland	79,669
4	 Norway	67,989
5	 United States	63,051
6	 Singapore	58,484
7	 Denmark	58,439
8	 Iceland	57,189
9	 Qatar	52,751
10	 Australia	51,885
11	 Netherlands	51,290
12	 Sweden	50,339
13	 Austria	48,634
14	 Finland	48,461
15	 Germany	45,466
—	 Hong Kong	45,176
16	 Belgium	43,814
17	 Canada	42,080
18	 San Marino	41,683
19	 Israel	41,560
20	 France	39,257
21	 United Kingdom	39,229
22	 Japan	39,048
—	 Macau	38,769
23	 New Zealand	38,675
24	 United Arab Emirates	31,948
25	 Italy	30,657

Table 2.1 - Gross Domestic Product per capita, 2020; IMF data.

Table 2.2 - Rankings from the *2020 World Happiness Report*: The Top 25 and Bottom 10.

Overall rank ↕	Country or region ↕	Score ↕	GDP per capita ↕	Social support ↕	Healthy life expectancy ↕	Freedom to make life choices ↕	Generosity ↕	Perceptions of corruption ↕
1	 Finland	7.809	1.285	1.500	0.961	0.662	0.160	0.478
2	 Denmark	7.646	1.327	1.503	0.979	0.665	0.243	0.495
3	 Switzerland	7.560	1.391	1.472	1.041	0.629	0.269	0.408
4	 Iceland	7.504	1.327	1.548	1.001	0.662	0.362	0.145
5	 Norway	7.488	1.424	1.495	1.008	0.670	0.288	0.434
6	 Netherlands	7.449	1.339	1.464	0.976	0.614	0.336	0.369
7	 Sweden	7.353	1.322	1.433	0.986	0.650	0.273	0.442
8	 New Zealand	7.300	1.242	1.487	1.008	0.647	0.326	0.461
9	 Austria	7.294	1.317	1.437	1.001	0.603	0.256	0.281
10	 Luxembourg	7.238	1.537	1.388	0.986	0.610	0.196	0.367
11	 Canada	7.232	1.302	1.435	1.023	0.644	0.282	0.352
12	 Australia	7.223	1.310	1.477	1.023	0.622	0.325	0.336
13	 United Kingdom	7.165	1.273	1.458	0.976	0.525	0.373	0.323
14	 Israel	7.129	1.216	1.403	1.008	0.421	0.267	0.100
15	 Costa Rica	7.121	0.981	1.375	0.940	0.645	0.131	0.096
16	 Ireland	7.094	1.447	1.471	0.976	0.588	0.295	0.373
17	 Germany	7.076	1.314	1.369	0.972	0.564	0.252	0.309
18	 United States	6.940	1.374	1.405	0.832	0.535	0.298	0.152
19	 Czech Republic	6.911	1.212	1.405	0.895	0.506	0.046	0.050
20	 Belgium	6.864	1.296	1.399	0.965	0.500	0.147	0.209
21	 United Arab Emirates	6.791	1.431	1.251	0.788	0.653	0.281	0.220
22	 Malta	6.773	1.253	1.443	0.972	0.633	0.341	0.179
23	 France	6.664	1.268	1.459	1.030	0.514	0.113	0.227
24	 Mexico	6.465	1.024	1.226	0.832	0.554	0.083	0.083
25	 Taiwan	6.455	1.327	1.358	0.878	0.449	0.151	0.132
144	 India	3.573	0.731	0.644	0.541	0.581	0.237	0.106
145	 Malawi	3.538	0.177	0.530	0.446	0.487	0.213	0.132
146	 Yemen	3.527	0.393	1.177	0.415	0.244	0.095	0.087
147	 Botswana	3.479	0.998	1.086	0.494	0.509	0.033	0.102
148	 Tanzania	3.476	0.457	0.873	0.443	0.509	0.272	0.204
149	 Central African Republic	3.476	0.041	0.000	0.000	0.293	0.254	0.028
150	 Rwanda	3.312	0.343	0.523	0.572	0.604	0.236	0.486
151	 Zimbabwe	3.299	0.426	1.048	0.375	0.377	0.151	0.081
152	 South Sudan	2.817	0.289	0.553	0.209	0.066	0.210	0.111
153	 Afghanistan	2.567	0.301	0.356	0.266	0.000	0.135	0.001

What you will learn in this chapter:

- GDP was not designed to measure human well-being, just the money value of production in the market economy.
- Nevertheless, GDP per capita is widely interpreted as a measure of well-being, and it is often used to compare the performance of economies.
- Alternative measures of production and human well-being have been proposed, many of them simple variations on GDP.
- The most popular alternative measure is the United Nations Human Development Index, which is a weighted average of GDP, education levels, and health conditions.
- Other alternatives include lifetime measures of GDP, GDP with environmental damage netted out, and GDP with household and informal economic activity added.
- Part of the reason why GDP per capita is justified as a measure of human well-being is that mainstream macroeconomics has come to equate the production of goods and services with well-being under the assumption that all well-being is derived from the consumption of goods and services.
- Such mainstream models do not accord with any scientific evidence, which finds that human well-being depends on much more than goods and services consumed.
- Social relations matter a lot for perceptions of well-being, as do economic and natural conditions.
- Humans also perceive their conditions differently in the short and long terms.
- Human perceptions of happiness and life satisfaction evolved over time, which suggests that humans favor conditions and economic circumstances that enhance the likelihood of survival and procreation.
- Research in the fields of psychology, neuroscience, and behavioral economics show that significant determinants of long-run human well-being include friendship, dignity, security, good health, participation in productive activity, compatibility with the natural environment, and social status.
- The simple welfare function used in neoclassical economics, which takes individual welfare as a specific positive function of the sum of some finite set of consumption items, therefore cannot capture human happiness.
- Humans are social creatures whose individual welfare depends on the welfare of the whole society and their position within that society.
- Per capita GDP is, at best, only partially correlated with human happiness and life satisfaction.
- In rich countries there may be no relationship at all between the two at all.
- So, if it is true that the mere growth of output of goods and services does little for human well-being or life satisfaction, then we must also question economic policies solely designed to expand the production of goods and services.

2.1 Measuring the Economy: GDP

Most economists and social scientists would probably agree that an economy should be judged according to how well people in the economy live. However, there is little consensus on exactly how to measure true **human well-being**. Any measure is going to be somewhat subjective, as every person has their own idea about what makes them happy and satisfied with life. In the press and in economic studies, we most often see the performance of our economy quantified in terms of a measure called **Gross Domestic Product (GDP)**. You just encountered this measure above in the introduction to this chapter, where we contrasted it with people's sense of happiness. GDP is not a very accurate measure of national well-being, but it is so often used — perhaps for lack of other convenient or better alternatives. We therefore begin by detailing this popular, albeit flawed, measure of the macroeconomy.

United States GDP essentially measures the dollar value of goods and services sold through the market sector of the US economy over the course of the year. This estimate of the market value of private production is supplemented with the cost of government services provided and the implicit value of shelter provided by the nation's housing stock. In 2021, US GDP was about \$22 trillion. To make this measure meaningful to individual citizens, and to make it comparable across countries with different populations, GDP can be expressed in *per capita* terms — the average value per person. Average per capita GDP for the U.S. was about \$66,000 in 2021.

2.1.1 The history of GDP

The specific measure called Gross Domestic Product was invented more than 80 years ago during the Great Depression in the United States, when the Franklin D. Roosevelt administration was initiating a whole range of policies to deal with the sharp economic decline and record levels of unemployment. The government policymakers needed feedback on how well their macroeconomic policies were working to increase production and reduce unemployment. Simon Kuznets, a noted economist at the time, led efforts to provide U.S. policymakers with timely information on how effectively the government's programs were working to increase production and get unemployed workers back to work. Kuznets reasoned that it would be easiest to survey a sample of industries and merchants to estimate the money value of production in the market economy. By focusing on market production, household production was effectively ignored. But, the government wanted to know if people were going back to work in the market economy. On the other hand, government goods and services did not pass through markets either, but they were included in Kuznet's measure by substituting the budget costs of providing government production for the missing market prices.¹ As his quote at the start of this chapter suggests — Kuznets never intended GDP to represent human well-being. He only wanted to measure the growth of market production and the effect of government programs on employment in the market economy.

¹ The cost of providing a product does not necessarily equal the “value” of that product. In a capitalist system, producers seek to sell their products for more than above their costs of production; therefore, the “value” of products as revealed by consumers willing to pay the selling prices usually exceeds their cost.

In practice, by checking in with a sample of producers and merchants in the market economy, the U.S. government statistical agency was able to calculate any given month's GDP within 45 days. In short, GDP was indeed able to provide quick feedback on how well government policies were affecting the private sector of the US economy. But, despite the fact that GDP was never intended to accurately measure how happy or well off people really are, economists today routinely present **GDP per capita** numbers as an indicator of a nation's standard of living. And, by comparing GDP on a month-to-month or year-to-year basis, GDP is used to measure the **rate of growth** of the economy.

The inappropriate use of GDP as a measure of well-being is, most likely, due to the simple fact that it is readily available. GDP is compiled by all countries' official statistical agencies in accordance with standardized procedures agreed to over the past 75 years by various working groups, initially under the auspices of the United Nations, more recently under accounting rules set by the International Monetary Fund. These procedures have helped to standardize GDP data from around the world, thus seemingly legitimizing their use for making international economic comparisons. However, different countries' GDP data are not equally accurate as indicators of national well-being because the mix of market, government, and household production is different in each country; that the percentage of real production included in GDP differs across countries. Also, it is costly to gather information, even for simple measures like GDP, and shortcuts are often taken. Some governments intentionally distort their data.

2.1.2 Revealing the ideological bias of GDP

GDP's widespread use is not only due to its convenience and availability. GDP is also used by governments and most economists because it is compatible with how orthodox — mainstream — economics likes to think about human well-being. Most economists, as well as the political leadership in most Western countries, accepts the idea that people have well-defined and stable individual **welfare functions**. That is, most professional economists view society as a group of individuals, each with his or her own sense of personal well-being that is assumed to be a constant relationship to the consumption of goods and services produced in the economy. Economists commonly show this relationship in mathematical notation. Specifically, an individual i 's welfare, denoted as w_i , is commonly defined as a function of the products consumed, such as

$$w_i = f_i(x_1, x_2, \dots, x_n) \quad (2.1)$$

in the case where the world produces n products, denoted as x_1 through x_n .

Now, think about this function for a moment. Do you agree that your happiness and satisfaction with life really depend only on the goods and services that you personally acquire in the commercial market and consume over the course of a month or a year? Also, ask yourself if the same set of goods and services brings the same level of happiness or life satisfaction at every point in time over the course of that month or year, or at every stage of your life? A simple example quickly invalidates the assumption of a constant individual welfare function: A glass of water clearly has some value, but its value certainly differs depending on whether you have

already consumed several glasses within the past hour or you just spent the entire afternoon working in your garden without a drop to drink. In this sense, individual welfare functions are never constant and unchanging. You are also likely to note that your happiness is not entirely independent of the well-being of other people around you. Another person's consumption may fill you with envy or their lack of consumption may trigger empathetic sadness. Your children's rising consumption may make you more satisfied with your own life. In short, welfare functions are not independent of others' well-being — they are not individualistic.

In order to arrive at a **social welfare function** to quantify an entire society's well-being, economists must make even **stronger** — more specific and detailed — assumptions. A standard version of a social welfare function for a country with a population of n individuals assumes that total well-being is equal to the sum of well-being of all individuals. Total aggregate well-being, W , is thus stated as the sum of all the welfare levels of all m individuals:

$$W = \sum_{i=1}^m w_i \quad (2.2)$$

This mathematical representation of aggregate well-being effectively states that when the sum of goods and services consumed by all people in the economy increases, the “people” are better off.

Measures such as equation (2.2) are popular because, in practice, it is easier to compare production of goods and services in terms of their monetary values, calculated as the quantity times the price at which they are exchanged in markets, compared to calculating the qualitative characteristics of products or, even more daunting, how the quality of life is influenced by the social and natural environments within which all the products are supplied and consumed. Specifically, the well-being of individual i , w_i , is thus usually stated as the sum of the money values of the n products each individual consumes:

$$w_i = p_1x_1 + p_2x_2 + \dots + p_nx_n = \sum_{j=1}^n p_jx_j, \quad (2.3)$$

where p_j is the price of product j and x_j is the physical quantity of product j .

In addition to the assumption that there are m goods, let's again suppose there are m people in the population. Then the total welfare or well-being of society — social welfare — can be conveniently calculated as the sum of the values of all m products consumed by each of the m people in the total population:

$$W = \sum_{i=1}^m \left(\sum_{j=1}^n p_jx_j \right). \quad (2.4)$$

Equation (2.4) is effectively the definition of GDP — the sum value of all goods and services produced in the market economy, calculated as the total amount of products produced, each multiplied by its monetary price. Per capita GDP is thus W divided by the total population m , or

$$W/m = \left[\sum_{i=1}^m \left(\sum_{j=1}^n p_jx_j \right) \right] / m \quad (2.5)$$

Equation (2.5) thus defines national well-being as the sum of the market values of products supplied. This is effectively how countries effectively calculate the measure we call GDP per capita.

In accepting GDP per capita as an indicator of national social well-being we effectively make some very questionable assumptions. First of all, by simply adding together individual welfare functions, the aggregate function assumes all individuals are identical. It assumes, for example, that a glass of water or a new car have exactly the same welfare impact on each person in the economy. Secondly, the assumption that the total is the precise sum of individual functions implies that the economy's overall performance has no impact on individual welfare, that an individual does not care at all about how anyone else is doing. It effectively assumes that each individual's welfare function is completely separated from the welfare of others and, more generally, from the economic, social, and political circumstances in which the person lives, that it does not matter whether society is peaceful and prosperous or in a state of total chaos and disarray, as long as the person gets to consume the same mix of goods and services.

All evidence from the fields of sociology, psychology, anthropology, political science, neuroscience, biology, and history clearly shows that a person's happiness and satisfaction with life depends on much more than the individual consumption of material goods and services. Yet, by their use of GDP in their economic analysis, economists implicitly accept equation (2.5) as an accurate and useful definition of human well-being. Note that the acceptance of this definition of well-being biases economists towards favoring economic systems that emphasize individual material consumption over systems in which social relations take on a more central role and people use more public — that is, non-market — goods and services. Macroeconomics, as it is commonly practiced, is therefore not the ideologically neutral social science it pretends to be.

2.1.3 GDP vs. GNP

A measure called **Gross National Product** (GNP) is sometimes used in place of gross *domestic* product (GDP). In fact, GNP was the predominant measure used in the US up until the 1980s. A country's gross national product (GNP) measures the value of output produced by the nation's workers and other factors of production, regardless of the country in which the production actually takes place. For example, the domestic output produced in a factory that is owned by foreigners is included in the foreign country's GNP and is excluded from the GNP of the country where the factory is located. Gross domestic product (GDP), on the other hand, measures the total value of output within a country's political borders no matter what the nationality of the owners of the business, the factory building, or all other inputs into the production process.

In our global economy, in which the share of productive assets owned by foreigners continues to increase in almost every country, differences between GDP and GNP have become larger. Transnational corporations dominate production in most of the world's economies, and these firms are often owned by stockholders that live in many different countries, managed by executives from many different countries, and production of final goods is often split between many different countries. In short, the nationality of the **means of production** — the capital, land, and the resources used in production — has become very difficult to determine. GDP merely classifies activity according to well-defined national borders.

2.1.4 GDP omits household production and other “informal” production

It is well known that GDP does not include all of a country’s production. Recall that GDP was designed to quickly provide policymakers with easily available information on the current performance of an economy. Speed in compiling the data was of the essence in order to enable policymakers and central banks to react to economic conditions as quickly as possible, so for the data to be timely, shortcuts were taken. Market transactions could be estimated using tax collection data, transportation data, banking data, private firms’ accounting records, and surveys of business managers. As already described, government budgets provided information on the monetary cost of government production of services. The estimated value of shelter provided by the country’s stock of housing was available from local tax records, publicly recorded deeds, and real estate records. However, not included in GDP are the services and products produced in the household. This latter information is difficult to collect because it would have to be provided by a very diverse set of household units who keep no formal records of most of their activities. Hence, home-cooked meals, parental childcare, and the tomatoes grown in the community garden for home consumption are not included in GDP.

A large share of household activity falls into the category of **care work**, which includes direct, personal and relational activities, like caring for children or nursing someone who is ill, as well as indirect care, like cooking and cleaning. Most of the care work done around the world is unpaid and done by women and girls. The amount of time women spend doing unpaid caregiving in comparison to men has profound impacts on economic inequality across gender, an issue that has been studied and analyzed in the field of feminist economics. When the work is paid, it is most often done by women workers from ethnic minorities and immigrant groups. Wages for care work are, on average, well below median wage rates in the United States. And, when care work is performed by undocumented workers it is often not reported, and thus not measured in GDP. Care work has already been one of the fastest-growing sectors of the American economy, and it is likely to grow further as the elderly population in the United States — and in most other high income countries — grows relative to other age groups. During the Covid-19 pandemic, this workforce, which is overwhelmingly female and disproportionately people of color, has become even more essential but undercounted in GDP.

Beginning at least with Betty Friedan (1963), feminist economists have argued that the value of their household work is quite high. Feminist economists like Marilyn Waring (1988), Nancy Folbre (1994), Julie Nelson (1995), and Susan Himmelweit (1995) have pointed out that household productive tasks such as childcare, preparation of meals, and cleaning are crucial to the functioning of the paid market economy. Valerie Ramey and Neville Francis (2006) estimated that in the United States, women’s home production hours are about equal to their total market employment hours, which, in a later paper, Ramey (2008) estimated to have been about 25 hours per week throughout the 20th century. The Levy Economics Institute compiles a measure of US economic well-being that explicitly includes household production, and by comparing it to GDP we can see that the latter may undercount the true value of production by 25 to 50 percent.

GDP also does not include so-called *informal* economic activity, which is production of services and goods outside the normal legal labor and product markets. Illegal services and products, like drugs, “escort” services, and gambling, fall into this category. But many informal

products services are perfectly legal and common products and services except that they are provided off the record, perhaps to evade taxes, licensing fees, or other regulatory costs. Informal activities include such things as street selling, maid and childcare services not reported to the tax authorities, work performed by undocumented immigrants, home manufacturing that does not pay minimum wages, taxis that have not paid licensing fees, construction without official building permits, and assorted other cash transactions not reported to the tax authorities. The World Economic Forum (2020) estimates that such informal economic production may be equal to as much as half the value of real GDP in some African, Latin American, and Asian countries, and even 20 percent in some developed high-income economies.² Again, the omission of informal production from GDP causes it to undercount the true value of domestic production.

2.1.5 Counting the “bads” as well as the goods

Another serious shortcoming of conventional GDP data is that some of the counted production actually diminishes human welfare. Kenneth Boulding (1966) referred to such production as *bads* as opposed to goods. For example, countries spend enormous amounts of money on their militaries, and this entire cost is added to GDP. If the military never does a thing, GDP still goes up by the amount that the military and all its equipment costs, and there is no accounting of what could have been accomplished with the labor and other resources taken by military. And, if the military actually goes to war, destroys another country, and its soldiers die, those losses are not deducted from any country’s GDP. Worse yet, if some soldiers return injured and require expensive medical attention for the rest of their lives, GDP increases each year by the cost of the medical care. Clearly, GDP is not properly measuring human well-being.

2.1.5 Adjusting for price differences over time and space

The use of product prices to quantify the total value of production becomes problematic when the prices of specific products change over time or between countries. Statisticians have struggled for decades to accurately account for price changes when calculating the growth of GDP, for example. They normally use **price indices**, which are weighted averages of the prices of representative samples of goods and services consumed or produced in a country, to convert the yearly estimates of **nominal GDP** — the money value of production — to **real GDP** — the true value of using the goods and services produced.

However, production and consumption patterns depend on levels of income, country size, culture, geographic location, and many other factors unique to individual countries and time periods. Therefore, price indices of identical samples of goods and services are not equally representative of all societies in all time periods. Historical time-series of price indices thus tend to overstate inflation when price indices are calculated for constant samples of goods and services. Such unchanging samples fail to reflect (1) the substitution of cheaper products for more expen-

² As reported in <https://www.weforum.org/agenda/2019/11/measuring-the-global-informal-economy/>

sive products as relative prices change, (2) changes in overall consumption patterns as the economy grows and incomes rise, and (3) improvements in product quality and performance.³ An *overstatement* of inflation causes estimates of real GDP (or GNP) to *understate* the growth rate of the real value of goods and services produced.

2.2 Is There a Better Measure of Human Well-Being?

The previous section highlighted some of the problems with using GDP as a proxy for measuring the overall well-being of a country's citizens:

- GDP does not include all the things that affect human welfare, such as leisure, friendship, social interaction, and entertainment.
- Nor can we simply sum up individual levels of monetary income or the value of consumption to find “total” well-being in an economy.
- Household activities such as childcare, food preparation, and eldercare are not counted; nor is production in the informal sector of the economy.
- Some of the goods and services included among the x's in the welfare functions may have a negative effect on well-being, such as cigarettes or some of the activity of unregulated financial markets; these products should be subtracted from, not added to, a measure intended to serve as an indicator of total well-being.
- Increases in the cost of providing healthcare increases GDP, but the actual health of the population is not counted in GDP.

This section looks at a number of adjustments that can be made to GDP. However, it is not clear whether just tweaking the GDP formula can get us closer to a measure of human well-being.

2.2.1 Adding in the value of leisure

GDP measures only market production, which means it fails to account for the value of leisure. If people value an additional hour of leisure more highly than the goods and services they can acquire with their earnings from an additional hour of work, then human well-being rises when people choose to work less. But, because GDP does not count the value of leisure, GDP declines when people decide to improve their lives by working less and opting for more leisure.

³ A thorough discussion of the comparability of national accounts is provided by Irving Kravis (1984), who was one of the original designers of the national accounting procedures at the United Nations. See also Oskar Morgenstern's (1950) classic critique of GDP as a growth measure.

Table 2.3 - Average Annual Hours Worked: 1870 - 2012

<i>Country</i>	<i>1870</i>	<i>1913</i>	<i>1950</i>	<i>1973</i>	<i>1990</i>	<i>1998</i>	<i>2012</i>
Austria	2,935	2,580	1,976	1,778	1,590	1,515	1,699
Belgium	2,964	2,605	2,783	1,872	1,638	1,568	1,544
Denmark	2,945	2,553	2,283	1,742	1,638	1,664	1,546
Finland	2,945	2,588	2,035	1,707	1,668	1,637	1,672
France	2,945	2,588	1,926	1,771	1,539	1,503	1,479
Germany	2,841	2,584	2,316	1,804	1,566	1,523	1,397
Ireland			2,250	2,010	1,700	1,657	1,529
Italy	2,886	2,536	1,997	1,612	1,500	1,506	1,752
Netherlands	2,964	2,604	2,208	1,751	1,347	1,389	1,381
Spain			2,200	2,150	1,941	1,908	1,686
Sweden	2,945	2,588	1,951	1,571	1,508	1,582	1,621
Switzerland	2,984	2,624	2,144	1,930	1,644	1,595	1,636
United Kingdom	2,984	2,624	1,958	1,688	1,637	1,489	1,654
Australia	2,945	2,588	1,838	1,708	1,645	1,641	1,728
Canada	2,964	2,605	1,967	1,788	1,683	1,663	1,710
United States	2,964	2,605	1,867	1,717	1,594	1,610	1,790
Japan	2,945	2,588	2,166	2,042	1,951	1,758	1,745
Argentina			2,034	1,996	1,850	1,903	n.a.
Brazil			2,042	2,096	1,879	1,841	n.a.
Chile			2,212	1,955	1,984	1,974	2,029
Mexico			2,154	2,061	2,060	2,073	2,226
Peru			2,189	2,039	1,930	1,926	n.a.
Venezuela			2,179	1,965	1,889	1,931	n.a.

Source: Angus Madisson (2001), Table E-3, p. 347; 2010 estimates downloaded from the OECD, data set named "Average annual hours actually worked."

The economic historian Robert Fogel (1999) estimated the changes in what he calls *earnwork* and *volwork* in the United States since 1880. Fogel uses these terms in order to avoid misunderstandings about the word leisure, which connotes rest and inactivity. Time off from paid work in fact often involves activities such as volunteer work, sports, gardening, organizing social events, and home improvement projects. Fogel defines *earnwork* as activity undertaken primarily to earn income; the second term refers to voluntary leisure activity or rest. As Table 2.3 details, overall hours worked have declined over the past century, and Table 2.4 shows that lifetime hours spent on *earnwork* and *volwork* have changed drastically in the United States since 1880. *Volwork* now exceeds *earnwork*. *Earnwork* has declined by over 50 percent, and *volwork* has increased more than fourfold. *Volwork* increased not only because people reduced their *earnwork*, but also because longer lifespans give people more years of retirement for doing *volwork*. Because it omits *volwork*, GDP presents a distorted picture.

Similar long-run patterns in the amount of leisure time are found for other countries. Table 2.3 shows the annual hours worked for a number of high income economies and several middle and low income economies from 1870 to 1998. For many European high income economies, an-

Table 2.4 - Fogel's Earnwork and Volwork: 1880 and 1995

<i>Activity</i>	<i>1880</i>	<i>1995</i>	<i>Activity</i>	<i>1880</i>	<i>1995</i>
Sleep	8	8	Lifetime hours	225,900	298,500
Meals and essential hygiene	2	2	Lifetime earnwork	182,100	122,400
Chores	2	2			
Travel to work	1	1	Lifetime volwork	43,800	176,100
Work	8.5	4.7			
Illness	0.7	0.5			
<i>Subtotal</i>	22.2	18.2			
Residual for leisure	1.8	5.8			

Source: Robert W. Fogel (1999), Tables 2 and 3, pp. 5 and 6.

nual hours of work fell by as much as 50 percent in little more than one-hundred years. Notice that today's high income countries have fewer work hours than lower income economies, although work hours fell everywhere. This reduction in hours is largely the result of the political acceptance of basic labor standards such as the 8 hour workday and five day workweek.

To complicate matters further, it is also important to note that there is not always a neat trade-off between human well-being and work. An interesting study by Helena Lopes (2011) reveals that people often enjoy working, and they claim to gain more than just money wages from their jobs. As discussed later in this chapter, research from behavioral economics and psychology shows that unemployment reduces overall human happiness very significantly, and the lost wages are just part of the reason. When people lose their jobs, they lose their sense of participation and belonging in a society. Workplaces provide social contacts that offer friendship, dignity, and appreciation.

2.2.2 Lifetime measures versus annual measures

Another weakness of real GDP per capita is that it measures output over some arbitrary brief period of time, usually one calendar year. To understand why an annual number is problematic, suppose two countries have the identical annual per capita real GDP of \$10,000, but in one country everyone lived for only 30 years while in the other country everybody lived to the ripe old age of 80. Since GDP only measures output over one year, it effectively suggests that these two countries provide their residents with the same levels of welfare. That is absurd, of course. Individuals normally live longer than one year, and most people judge the value of their lives by what happens to them over their lifetimes, not during just one calendar year. An accurate measure of an economy's capacity to satisfy human wants and provide people with well-being must reflect not only *how much* people have at some moment or period of time, but also *how long* the economy can keep people alive to experience the annual flows of goods and services.

The variation in life expectancy over the entire course of human history underscores the importance of the recent increases in life expectancy. 10,000 years ago in the primitive hunter-gatherer societies, about half of all children died before reaching the age of five. life expectancy was between 20 and 30 years from prehistoric times until about 1500. For example, George

Table 2.5 - Expected Individual Lifetime Welfare

A. Levels:

	Annual Real GDP per Capita				Life Expectancy at Birth				EILW			
	1820	1900	1950	1998	1820	1900	1950	1998	1820	1900	1950	1998
France	1,230	2,849	5,270	19,558	37	47	65	78	5,101	33,903	342,550	1,525,524
Germany	1,058	3,134	3,881	17,799	41	47	67	77	43,378	47,298	260,027	1,370,523
Italy	1,117	1,746	3,502	17,759	30	43	66	78	33,510	75,078	231,132	1,385,202
Nether.	1,821	3,533	5,996	20,224	32	52	72	78	58,272	183,716	431,712	1,577,472
Spain	1,063	2,040	2,397	14,227	28	35	62	78	29,764	71,400	148,614	1,109,706
Sweden	1,198	2,561	6,738	18,685	39	56	70	79	46,722	143,416	471,660	1,476,115
U.K.	1,707	4,593	6,907	18,714	40	50	69	77	68,280	229,650	476,583	1,440,978
U.S.	1,257	4,096	9,561	27,331	39	47	68	77	49,023	192,512	650,148	2,104,487
Japan	669	1,135	1,926	20,413	34	44	61	81	22,746	49,940	117,486	1,653,453
Russia	689	1,023	2,834	3,893	28	32	65	67	19,292	32,736	184,210	260,831
Brazil	740	704	1,672	5,459	27	36	45	67	19,980	25,344	75,240	365,753
Mexico	760	1,157	2,365	6,655	-	33	50	72	-	38,181	118,250	479,160
China	600	540	439	3,117	-	24	41	71	-	12,960	17,999	221,307
India	531	625	619	1,746	21	24	32	60	11,151	15,000	19,808	104,760
World	667	1,263	2,114	5,709	26	31	49	66	17,342	39,153	103,586	376,794

B. Annual Growth Rates:

	Per Capita Real GDP			Years of Life Expectancy at Birth			EILW		
	1820-00	1900-50	1950-98	1820-00	1900-50	1950-98	1820-00	1900-50	1950-98
France	1.06%	1.24%	2.77%	0.30%	0.65%	0.37%	1.36%	2.17%	1.90%
Germany	1.37	0.43	3.22	0.17	0.71	0.28	1.54	1.14	3.52
Italy	0.56	1.40	3.44	0.45	0.86	0.34	1.01	2.31	3.80
Nether.	0.83	1.06	2.57	0.61	0.65	0.16	1.45	1.72	2.74
Spain	0.82	0.32	3.78	0.28	1.15	0.48	1.10	1.48	4.28
Sweden	0.95	1.95	2.15	0.45	0.45	0.25	1.41	2.41	2.41
U.K.	1.24	0.82	2.10	0.28	0.65	0.22	1.53	1.47	2.33
U.S.	1.49	1.71	2.21	0.23	0.74	0.25	1.72	2.46	2.48
Japan	0.66	1.06	5.04	0.32	0.66	0.58	0.99	1.73	5.66
Russia	0.50	2.05	0.66	0.17	1.42	0.06	0.66	3.52	0.73
Brazil	-0.06	1.75	2.50	0.36	0.45	0.82	0.30	2.20	3.35
Mexico	0.53	1.44	2.18		-0.83	0.76	-	2.29	2.96
China	-0.13	-0.41	4.17		-1.08	1.13	-	0.66	5.37
India	0.20	0.00	2.18	0.17	0.58	1.29	0.37	0.56	3.53
World	0.80	1.04	2.09	0.22	0.92	0.61	1.02	1.96	2.73

Sources: Angus Maddison (2001), Table 1-5a, Table B-21; Because Maddison (2001) does not have per capita real GDP for 1900, we used Angus Maddison (1995), Table D, which, in most cases, corresponds to Maddison (2001); the few differences were not judged to be significant.

Acsadi and J. Nemeskeri (1970) used skeletal remains from northern Egypt to conclude that during the Neolithic period (6,000-3,000 BCE), life expectancy at birth was 21 years. John Hatcher's (1986) data on the lives of Benedictine monks in Canterbury, England, during the period 1395-1505 shows that their average life expectancy was just 22 years. As late as the

1500s, one quarter to one-third of all children died before reaching the age of five in England, Sweden, and Switzerland, three countries with life expectancies of over 80 years today. In the mid-1700s, life expectancy in London was still just 25 years. Today's life expectancies of near 80 years are a very substantial human accomplishment.

The most direct approach to deriving a measure of lifetime individual welfare is to calculate the product of annual real GDP per capita and average **life expectancy**. In any given year, life expectancy is the average age that newborns would reach if they are subject to the age-specific death rates prevailing in that country in that year. Real GDP per capita for that year reflects the money value of goods and services that the economy is able to provide the average person over the course of that year. The product of the two measures thus represents the economy's capacity in a certain year to (1) provide material welfare and (2) sustain an individual life. We thus define this multiplicative measure — let's call it **expected individual lifetime welfare** (EILW) — as $y_L = y_A \cdot E$, where y_A is annual per capita GDP, and E is life expectancy.

Table 2.5 shows the value of EILW calculated in a 2002 article for a large number of countries using data from covering the period 1820 - 2000.⁴ For example, the Indian economy in 1998 provided the average person with \$1,746 worth of goods and services. Economic and social conditions in India kept the average person alive to enjoy this level of consumption for 60 years. Thus, 1998 Indian EILW was \$104,760. In the United States in 1998, the economy provided each resident, on average, with \$27,331 worth of goods and services, while economic and social conditions enabled people to live, on average, for 77 years. Thus, US EILW in 1998 was \$2,104,487. US annual real GDP per capita was a little less than 16 times as great as that of India, but expected individual lifetime welfare per capita was over 20 times as great because the average American got to enjoy his or her higher annual income for 17 more years than the average Indian got to enjoy Indian real per capita GDP. Overall, Table 2.5 shows that the growth of EILW was faster than real GDP per capita growth in all countries because life expectancy rose in all countries.

There are some possible extensions and refinements of the EILW that should be pursued. For example, the Disability Adjusted Life Expectancy (DALE) data published by the World Health Organization (WHO), which measures the number of years that a person is "healthy and in full possession of his or her mental and physical capabilities," is probably a better measure with which to measure a person's lifetime welfare than simple life expectancy. However, the WHO has only compiled this measure for a few years, so it is not yet possible to construct a long time-series. The EILW could also be adjusted for other shortcomings of GDP by accounting for leisure, informal activity, and the contributions of nature to human welfare.

2.2.3 Life expectancy and life's order

The improvement in health affects human welfare in more ways than just increasing average amount of time that people get to enjoy life. Longer life expectancy also enhances human well-being in more subtle ways. The rise in life expectancy documented over the past several

⁴ Hendrik Van den Berg (2002), "Does Annual Per Capita Real GDP Overstate or Understate the Growth of Individual Welfare over the Past Two Centuries?" *The Independent Review* 7(2):181–196.

centuries reflects primarily reductions in infant mortality and the discovery of remedies for diseases that affected people of all ages. Today, overall, worldwide infant mortality is less than 50 per 1,000 births, one-tenth the level of the pre-agricultural world before 10,000 BCE and one-fifth the level of in the wealthiest countries just 200 years ago. Economic development and medical advances do not appear to have increased the maximum life span for humans; a few people lived to the age of one-hundred, or even longer, in ancient times. Rather, recent economic development has enabled a much higher percentage of people to live until a very old age. The lower likelihood of dying prematurely constitutes a substantial gain in human welfare. According to the health economist Frank Lichtenberg (1998):

People tend to live longer than they used to, and there is also less uncertainty about the age of death... If people are risk averse, they are made better off by the reduction in the variance, as well as by the increase in the mean, of the age at death.

The demographer Massimo Livi-Bacci (1997) described the reductions in infant mortality and the medical remedies that eliminated most mid-life maladies as adding “order” to life. This order fed back into economic growth because the reduction of mid-life death rates made it less likely that investments in education and work experience would be lost. People were thus able to become more long-run oriented because they could plan the costs and benefits of decisions early in life more accurately. Longer lives also give people more time to correct for bad decisions, and there are more second chances to take advantage of missed opportunities.

2.2.4 Accounting for the quality and variety of production

More troublesome for measures such as GDP is the likelihood that individual welfare is not a simple sum of x 's in a constant function such as equation 2.5. For one thing, how much one product adds to our welfare depends on what other products we consume. Hence, the welfare function is probably not linear. Because GDP is a measure of aggregate output, a simple sum of products consumed, it effectively assumes that it makes no difference for your welfare whether you eat the same \$5.75 lunch consisting of a hamburger, French fries, and a soda every day of the week or you eat the \$5.75 hamburger only on Monday, a \$4.50 Mexican taco platter on Tuesday, a \$4.00 spaghetti dish on Wednesday, a \$5.00 Chinese tofu stir fry on Thursday, and a \$9.50 Japanese sushi lunch on Friday. Even though the money value of the five lunches is \$28.75 in either case, the five different meals most likely provide greater welfare than identical hamburger platters every day of the week. “Variety is the spice of life” after all.

The value of variety is an important consideration when studying the long-run evolution of an economy. Since the beginning of the Industrial Revolution, production has become more standardized. For example, clothes were increasingly made on assembly lines in factories according to a limited number of patterns rather than custom tailored to each consumer's precise measurements and choices of cloth, design, quality, etc. Food was increasingly processed in large plants that produced standardized portions and flavors. Of course, the larger scale production that characterized industrialization also resulted in greatly decreased costs of production, and

manufactured clothing and prepared food products could be purchased with smaller and smaller fractions of family incomes. Henry Ford was rightfully praised for drastically reducing the cost of mass-producing automobiles, making them affordable to the average US consumer. But he was also criticized for giving consumers “any color they want as long as it is black.” If variety is important to people, it is very well possible that the increases in real per capita output brought about by industrialization *overstates* the actual gains in human welfare. In the future, perhaps modern programmable machinery and artificial intelligence can reverse the trend in uniformity of design and the decline in variety.

On the other hand, more variety and more choices do not always increase human welfare. Too much choice may worsen human welfare by making transactions more complicated. More choices require the evaluation of more information, and there is an increased risk of making a bad choice. A recent study by two psychologists shows that people buy less candy and jelly when the choice for those items increases in the supermarket.⁵ Perhaps people’s fear of making a mistake comes into play; numerous psychological studies have found that, all other things equal, people are risk averse.⁶ Human well-being is very difficult to define, much less quantify.

There are likely to be other types of interrelationships among the x ’s in the welfare function, further suggesting that the welfare function is not accurately represented by a linear function like that in equation 2.5. For example, the enjoyment of eating pizza may depend on how much beer is consumed along with the pizza. An automobile is of little value if we have no gasoline. The value of a product changes when the quantity or prices of *substitutes* and *complements* change.

In sum, not only are the x ’s on the right hand side of the equation interdependent, but, as the discussion of nature’s services, leisure, and household production makes clear, there is also substantial uncertainty about the x ’s that should be included. At the same time, we can probably all agree on quite a few things and social conditions that contribute to people’s well-being. But, how do we get to a practical measure that most people, and most economists, find reasonably realistic? In the remainder of this chapter, we will look at a popular alternative measure of national well-being: the *Human Development Index*. Then, when this measure turns out to not be entirely satisfactory either, we will look at *happiness studies*, a practical approach to quantifying human happiness and satisfaction with life.

2.3 The United Nations’ Human Development Index

In recognition of the shortcomings of GDP as a measure of human well-being and the need for a broader-based measure, the United Nations Development Programme (UNDP) has for over three decades annually published its composite **Human Development Index** (HDI). The HDI is a weighted average of (1) real per capita income, (2) life expectancy, (3) the literacy rate, and (4) school enrollment rates. The weights of the four components of the index change with the level of real per capita income, however. The UNDP gave increases in per capita real output substantial weight only for low income countries, where basic needs were not being met for most people.

⁵ Barry Schwartz (2004), “Nation of Second Guesses,” *New York Times*, January 22.

⁶ See, for example, Cass Sunstein (2005).

Table 2.6 - The UNDP Human Development Index

Human Development Index and its components

HDI RANK	Human Development Index (HDI)	SDG 3 Life expectancy at birth	SDG 4.3 Expected years of schooling	SDG 4.4 Mean years of schooling	SDG 8.5 Gross national income (GNI) per capita	GNI per capita rank minus HDI rank	HDI rank
	Value	(years)	(years)	(years)	(2017 PPP \$)		
	2019	2019	2019 ^a	2019 ^a	2019	2019	2018
Very high human development							
1 Norway	0.957	82.4	18.1 ^b	12.9	66,494	7	1
2 Ireland	0.955	82.3	18.7 ^b	12.7	68,371	4	3
2 Switzerland	0.955	83.8	16.3	13.4	69,394	3	2
4 Hong Kong, China (SAR)	0.949	84.9	16.9	12.3	62,985	7	4
4 Iceland	0.949	83.0	19.1 ^b	12.8 ^c	54,682	14	4
6 Germany	0.947	81.3	17.0	14.2	55,314	11	4
7 Sweden	0.945	82.8	19.5 ^b	12.5	54,508	12	7
8 Australia	0.944	83.4	22.0 ^b	12.7 ^c	48,085	15	7
8 Netherlands	0.944	82.3	18.5 ^b	12.4	57,707	6	9
10 Denmark	0.940	80.9	18.9 ^b	12.6 ^c	58,662	2	10
11 Finland	0.938	81.9	19.4 ^b	12.8	48,511	11	11
11 Singapore	0.938	83.6	16.4	11.6	88,155 ^d	-8	12
13 United Kingdom	0.932	81.3	17.5	13.2	46,071	13	14
14 Belgium	0.931	81.6	19.8 ^b	12.1 ^a	52,085	6	13
14 New Zealand	0.931	82.3	18.8 ^b	12.8 ^c	40,799	18	14
16 Canada	0.929	82.4	16.2	13.4 ^c	48,527	5	14
17 United States	0.926	78.9	16.3	13.4	63,826	-7	17
18 Austria	0.922	81.5	16.1	12.5 ^c	56,197	-3	18
19 Israel	0.919	83.0	16.2	13.0	40,187	14	21
19 Japan	0.919	84.6	15.2	12.9 ^f	42,932	9	20
19 Liechtenstein	0.919	80.7 ^a	14.9	12.5 ^b	131,032 ^{d1}	-18	19
22 Slovenia	0.917	81.3	17.6	12.7	38,080	15	24
23 Korea (Republic of)	0.916	83.0	16.5	12.2	43,044	4	22
23 Luxembourg	0.916	82.3	14.3	12.3 ^a	72,712	-19	23
25 Spain	0.904	83.6	17.6	10.3	40,975	6	25
26 France	0.901	82.7	15.6	11.5	47,173	-1	26
27 Czechia	0.900	79.4	16.8	12.7 ^c	38,109	9	26
28 Malta	0.895	82.5	16.1	11.3	39,555	6	28
29 Estonia	0.892	78.8	16.0	13.1 ^c	36,019	9	30
29 Italy	0.892	83.5	16.1	10.4 ^j	42,776	0	29
31 United Arab Emirates	0.890	78.0	14.3	12.1	67,462	-24	30
32 Greece	0.888	82.2	17.9	10.6	30,155	14	33
33 Cyprus	0.887	81.0	15.2	12.2	38,207	2	32
34 Lithuania	0.882	75.9	16.6	13.1	35,799	5	35
35 Poland	0.880	78.7	16.3	12.5 ^a	31,623	8	34
36 Andorra	0.868	81.9 ^a	13.3 ^b	10.5	56,000 ¹	-20	36
37 Latvia	0.866	75.3	16.2	13.0 ^c	30,282	8	37
38 Portugal	0.864	82.1	16.5	9.3	33,967	2	38
39 Slovakia	0.860	77.5	14.5	12.7 ^c	32,113	3	39
40 Hungary	0.854	76.9	15.2	12.0	31,329	4	42
40 Saudi Arabia	0.854	75.1	16.1	10.2	47,495	-16	40
42 Bahrain	0.852	77.3	16.3	9.5	42,522	-12	41
43 Chile	0.851	80.2	16.4	10.6	23,261	16	43
43 Croatia	0.851	78.5	15.2	11.4 ^a	28,070	6	44
45 Qatar	0.848	80.2	12.0	9.7	92,418 ^d	-43	45
46 Argentina	0.845	76.7	17.7	10.9 ^c	21,190	16	46
47 Brunei Darussalam	0.838	75.9	14.3	9.1 ^f	63,965	-38	47
48 Montenegro	0.829	76.9	15.0	11.6 ^m	21,399	13	48
49 Romania	0.828	76.1	14.3	11.1	29,497	-1	49
50 Palau	0.826	73.9 ^a	15.8 ^j	12.5 ^j	19,317	15	52
51 Kazakhstan	0.825	73.6	15.6	11.9 ^j	22,857	9	53
52 Russian Federation	0.824	72.6	15.0	12.2 ^j	26,157	2	49
53 Belarus	0.823	74.8	15.4	12.3 ^m	18,546	14	49
54 Turkey	0.820	77.7	16.6 ^c	8.1	27,701	-4	54
55 Uruguay	0.817	77.9	16.8	8.9	20,064	9	56
56 Bulgaria	0.816	75.1	14.4	11.4	23,325	2	55
57 Panama	0.815	78.5	12.9	10.2 ^f	29,558	-10	58
58 Bahamas	0.814	73.9	12.9 ^a	11.4 ^j	33,747	-17	58
58 Barbados	0.814	79.2	15.4	10.6 ^o	14,936	20	60
60 Oman	0.813	77.9	14.2	9.7 ^j	25,944	-5	56
61 Georgia	0.812	73.8	15.3	13.1	14,429	22	63
62 Costa Rica	0.810	80.3	15.7	8.7	18,486	6	61

The UNDP assumed a “curved” relationship between income and well-being, with additions to money income having a smaller and smaller impact on well-being as incomes rise.

Table 2.6 lists the top 50 countries listed in the 2019 HDI. Contrast the HDI ranking with the simple GDP per capita rankings; notice there are similarities and differences. The definitions of the four components of the HDI in Table 2.6 are as follows:

- ***Life expectancy at birth***: The number of years a newborn infant is expect to live if prevailing patterns of age-specific mortality rates at the time of birth stay the same throughout its life.
- ***Expected years of schooling***: The number of years of schooling that a child entering school age will receive if current age-specific enrollment rates persist throughout the child’s life.
- ***Mean years of schooling***: The average number of years of education received by people aged 25 and older, converted from education attainment levels using official durations of each level.
- ***Gross national product (GNI) per capita***: As defined earlier, the per capita level of the value of all production carried out by domestic factors of production, converted to international dollars using purchasing power parity rate for each currency.

Rankings of countries in Table 2.6 are not neatly correlated with average gross domestic product, nor is income tightly correlated with the education and health components. The HDI gives the latter two components more weight in the index, as evidenced by the ranking of the United States in 17th place despite its high level of average income. Among other differences, Americans live about four years less on average than people in all other countries with per capita GDPs similar to the US.

2.4 Defining Happiness and Explaining Human Behavior

The HDI is often cited, but the measure still does not address many of the problems with measures of human well-being that we have discussed. Its weighted average of several separate measures is rather arbitrary, and many other things not included in the HDI have been shown to matter for human happiness. But, what measure would be more accurate? Is it even possible to come up with a reasonable single measure to represent the well-being of an entire population?

2.4.1 Philosophers’ take on happiness

The search for the source of personal happiness has occupied philosophers and other thinkers for ages. We may as well begin with one of the most prominent ancient thinkers, Aristotle. In his *Rhetoric*, Aristotle wrote:

We may define happiness as prosperity combined with excellence; or as independence of life, or as the secure enjoyment of the maximum of pleasure; or as a good condition for property and body, together with the power of guarding one’s property and body and making use of them. That happiness is one or more of these things, pretty well everyone

agrees. From this definition of happiness it follows that its constituent parts are: good birth, plenty of friends, good friends, wealth, good children, plenty of children, a happy old age, and also such bodily excellences as health, beauty, strength, large stature, athletic power, together with fame, honor, good luck and excellence.

Note that not all of Aristotle's suggested determinants of human happiness can be achieved by increasing the economy's material output or average income. While his definition of happiness includes some of the alternative measures of economic welfare introduced in the previous chapter — health, education, and longevity — that are at least partially related to national production, it is not obvious that the growth of output as measured by GDP increases fame or friendship. And, what can we possibly do to improve our luck?

Another way to find out what makes people happy is to examine the fantasies and dreams expressed in the popular arts, stories, and literature. For example, Herman Pleij (2001) surveys the arts, literature, and popular culture to reconstruct the mythical place known *Cocagne*, which often appeared in the writings and art in Medieval Europe (the period from the fall of Rome in the 5th Century until the Renaissance beginning in the 13th Century). During those times, life in Europe was not nearly as comfortable as it is today. People were much more impacted by the cold and heat of the changing seasons. Without advanced technologies of food storage and preservation, people were forced to greatly vary their diets over the course of the year. Starvation was always a threat.

Europe's dominant religion, Christianity, did offer one channel of relief from the hardship and toil, namely the possibility of attaining eternal bliss in the afterlife. Heaven had its entrance requirements, however; it was open only to those who behaved well and followed the rules. And, of course, a person had to die before they could gain entrance to heaven. There were thus other popular fantasies that helped people cope with the struggles they faced. As described by Pleij (2001, p. 3), in Medieval Europe no myth was more popular than the fantasy of *Cocagne*:

It was a country, tucked away in some remote corner of the globe, where ideal living conditions prevailed: ideal, that is, according to late-medieval notions... Work was forbidden, for one thing, and food and drink appeared spontaneously in the form of grilled fish, roast geese, and rivers of wine. One only had to open one's mouth, and all that delicious food practically jumped inside... The weather was stable and mild — it was always spring — and there was the added bonus of a whole range of amenities: communal possessions, lots of holidays, no arguing or animosity, ... a fountain of youth, beautiful clothes for everyone, and the possibility of earning money while one slept.

Pleij's description of *Cocagne* makes it clear that human fantasies about what constitutes ultimate happiness have changed somewhat since Medieval times. If we were to fantasize about paradise today, roast goose would probably no longer appear on people's wish lists, perhaps replaced by lobster, French cuisine, or gourmet vegetarian dishes. Material things like automobiles, home entertainment centers, and 3,000 square foot homes would also head the list. As work has become more pleasant, many people today might replace *Cocagne*'s total ban on work with a more interesting career. On the other hand, nice clothes are still a desirable luxury

for many today, and, current spending on cosmetic surgery and dietary supplements suggests people are still searching for a fountain of youth.

Note that there is one important similarity between Cocagne and Aristotle's sources of happiness: both cases suggest people do not find happiness alone! Aristotle's fame and friendship requires the cooperation of other people within a human society. And in Cocagne, the desire for communal possessions and social harmony also suggests that human happiness is, to a considerable degree, determined by one's social environment. Indeed, both the arts and most social sciences — unlike economics — recognize that people are social animals and not pure individuals who are unaffected by other people or their social and natural surroundings.

2.4.2 What can psychologists tell us about happiness?

A number of psychologists have defined happiness as an assessment or perception that people arrive at by comparing their actual life to their expectations of what life should be like. A. C. Michalos (1985), for example, proposed a multiple discrepancy theory of happiness based on the difference between five main categories of people's desires, hopes, and expectations relative to what they actually achieve in life. Specifically, Michalos hypothesizes that individual happiness depends on the gap between expectations and the actual satisfaction of:

1. Basic needs and wants.
2. What one was accustomed to having earlier in life.
3. What one expects to have later in life.
4. What others in society have.
5. What one deserves.

Note also that the difference between expectations and actual outcomes in life is not obviously related to absolute levels of income. Michalos' multiple discrepancy theory is rather broad because the term "wants" is general enough to include much more than material wants. Michalos' wants can include Aristotle's "fame, friendship, or good luck."

The behavioral psychologist Abraham Maslow (1943) explained happiness in terms of a **hierarchy of needs**. Maslow argued that, first of all, happiness is fundamentally related to the physiological needs for human *survival*. The process of evolution has translated such a basic need for survival into a psychological sense of happiness when these basic needs for survival are satisfied. The second most important need associated with human happiness is *safety and security*. Third in Maslow's hierarchy of needs is people's need to feel they *belong* in the community they reside in. Fourth, people value the *love and respect* of others.

These latter two levels reflect the fact that human survival largely depended on group behavior. Nature is dangerous and cruel, and for humans, safety and survival depended in numbers. Those who were unable to relate to others and preferred isolation to cooperating with others were not as acceptable to group participation and, on their own, less likely to survive. More importantly, the need for others' respect and self-esteem was also important for increasing individual efforts towards achieving good group outcomes. Also, those who "played well with

others” were more likely to have contributed to the genes present in today’s humans. Therefore, modern human beings are happier when they are loved and respected in their communities, and they are encouraged to participate in the important activities of the community.

Maslow’s fifth, and top, category of human needs for happiness is *self-actualization*, which is the conscious feeling that you have to some substantial degree satisfied your hopes and ambitions, that you have accomplished what you think you were capable of achieving, and did not squander your opportunities. Exactly how this human need can be satisfied depends on a person’s character, innate abilities, world view, and societal constraints. You might conjecture that self-actualization depends on individual creativity, innovation, and intellectual activity, but it also depends on whether the economy has the capacity to provide the resources for carrying out those activities.

Take a close look at Maslow’s hierarchy of needs on the right. How important for satisfying these needs are the goods and services supplied by the market in a capitalist economy? Certainly, the market production measured by GDP is important for satisfying one’s basic needs for survival, but it is not the only means for achieving all of one’s needs and wants. In fact, once a person’s basic needs for survival are met, Maslow’s last three categories of human needs have little to do with GDP and much more to do with how society is organized and how its members participate in that society.



2.4.3 Happiness and human evolution

We might also examine other fields for scientific evidence on the causes of human happiness. It is very useful to begin with the field of evolutionary biology. After all, the characteristics that distinguish our species today emerged from the past process of biological evolution. In general, a species changes over time as genes are selectively passed from generation to generation, and in that process the genes of individuals who have many offspring show up more often in later generations than the genes of individuals who have fewer offspring. In the case where certain genes give individuals some advantage in surviving and thriving in human societies, it is those individuals who live longer and have more offspring. This natural selection then sets off a compound process that eventually causes the genes of those types of individuals to dominate and become characteristic of the entire species. Of course, even though a certain genetic structure becomes dominant in a population, the process of evolution does not stop. In fact, two fundamental sources of evolutionary change continue to operate.

First, genes are passed on from one generation to the next with occasional “copying mistakes” or **mutations**. Mutations are rare, but when they occur they result in new genes and new forms of human behavior. Sometimes the new behavior provides an advantage in generating

offspring, in which case the mutated genes will eventually come to dominate the genetic structure of the continually evolving species.

Secondly, the social and natural environments in which a species lives are subject to continual change. Climate, atmospheric conditions, geological conditions, the rotation of the earth, the shifting of the continental plates, and other physical changes in our natural environment continually alter the success and failure of specific gene structures. And, of course, all the other living things that share the natural environment with humans also continually evolve, thus changing humans' natural environment. Individual species must adapt to all these changes, or they will go extinct.

Since we seek to figure out how human happiness is determined, we are especially interested in how human thought processes have evolved. After all, happiness is a mental state. Patricia Churchland (2002) draws on many recent advances in neuroscience to explain the distinctive way in which the evolution of human ancestors led to the development of today's large brains:

The brain's earliest self-representational capacities arose as evolution found neural network solutions for coordinating and regulating inner-body signals, thereby improving behavioral strategies. Additional flexibility in organizing coherent behavioral options emerges from neural models that represent some of the brain's inner states as states of its body, while representing other signals as perceptions of the external world. Brains manipulate inner models to predict the distinct consequences in the external world of distinct behavioral options.

Human brains have evolved to where they can now interpret signals about smell, light, sound, touch, and taste from sensors located throughout the body in ways that permit humans to formulate sophisticated behavioral reactions to their economic, social, and natural environments. We refer to the brain's continual evaluation and interpretation of our external and internal circumstances, and how it shapes people's reactions to those circumstances, as **consciousness**. The conscious feelings of satisfaction or dissatisfaction, contentment or discontent, pleasure or displeasure, and comfort or discomfort can be summarized as a person's sense of **happiness**. The sense of *happiness* is thus part of a control mechanism operated by the brain, a capability that humans evolved over the generations and has permitted humans to successfully adapt to, and survive in, their changing natural and social environments.

Note that we are by no means suggesting that humans are unique in having a sense of consciousness. Nearly all living things can in some way sense their surroundings and react to what their senses perceive. For example, there is an extensive literature on elephants' complex feelings of empathy, joy, and anger.⁷ Trees sense aspects of their natural environment, and they use this information to direct their roots to where it detects the presence of water in the ground and extend new branches towards the light of the sun.⁸ What is important for our discussion of happiness is that the human brain evolved to react in a positive manner, by sensing pleasure or happiness, to conditions that were favorable to human survival. The positive sensual signals that

⁷ For a general introduction, see Charles Siebert (2006), M. Goodman et al. (2008), or Jeheskel Shoshani, William J. Kupsky, and Gary H. Marchant (2007).

⁸ For a clear explanation of plant consciousness, see Natalie Angier's (2009) article entitled "Sorry, Vegans: Brussels Sprouts Like to Live, Too," *New York Times*, December 22. For a very readable scientific paper on how plants consciously sense dangers and react to those dangers, see Nina Fatouros et al. (2008).

humans tend to equate with happiness are effectively the brain's evaluation of the body's performance and its likelihood of success in the natural and social environments humans and human ancestors lived in.

Fortunately, the field of neuroscience now has many techniques for monitoring brain activity, and this has allowed scientists to gain a better understanding of how the brain evaluates its circumstances and translates those sensual perceptions into feelings and actions. Specifically, by monitoring brain activity as people confront variations in their economic, social, and material circumstances scientists can gain insight into what makes people more or less happy.

2.4.4 Neuroscientific evidence on human behavior.

New techniques have enabled neuroscientists to distinguish what goes on in the human brain under different circumstances. The techniques have also permitted neuroscientists to identify the distinct functions of different parts of the brain, and this has greatly improved our understanding of the active processes of the human brain.⁹ As we understand more about how humans think, we can also begin to understand how human beings make economic decisions and how they feel about the economic system they live in. We economists can use this evidence to better judge the performance of the macroeconomy.

First of all, the new techniques have enabled neuroscientists to distinguish the distinct functions of specific parts of the brain and how they work together under different circumstances. First of all, the brain's very fast **automatic processes** occur with little or no awareness or feeling of effort. Mental reactions to pain, danger, and physical trauma, for example, are mostly automatic. These automatic brain processes and the behaviors they trigger are more like constants than behavioral variables. Humans share these automatic processes with many other living creatures and other older living organisms. The area of the brain where the automatic processes originate is called the *reptilian* sector of the brain, and it is at the base of the human brain.

Then there are the human brain's **affective** or **emotional processes**, which occur in the neocortex, a more recently evolved part of the human brain. Many emotional processes are unique to humans and other recent mammals. Note that by "recent" we still mean many millions of years, although this is a very short period within the three billion or more years that life has existed and evolved on earth. Affective processes are often referred to as **instinctive behavior**. These brain processes do not generate decisions predicted by economic models of rational choice either.

Finally, there are the brain's **cognitive**, or **deliberative, processes**. Deliberative brain activity potentially results in what economists define as rational decisions reached after weighing

⁹ The most popular neuroscientific tool at the present time is *brain imaging*, which detects the flow of blood through the brain. This method usually compares how the brain is activated when people are performing two different tasks and, thus, provides insight into which parts of the brain govern different functions. A related process is *diffusion tensor imaging*, which exploits the fact that water flows rapidly through the neural axons that transmit impulses from a brain cell. Neuroscientists also use *electrical brain stimulation* techniques that intentionally stimulate specific parts of the brain to see how behavior is affected.

alternatives and their respective costs and benefits. Neuroscience has determined that cognitive behavior emanates from the prefrontal cortex, a part of the brain that has developed in nearly all animals but is especially well developed in human beings. Humans are thus not unique in their ability to reason and think, but, arguably, humans stand out among living species in how well they reason.

The brain's activity thus consists of a variety of automatic, emotional, and deliberative responses to circumstances. Neuroscientists have further found that the three types of brain functions interact with each other, and the precise patterns of interactions vary with circumstances. The brain performs an enormous number of different computations in parallel in a very dense network of neural connections, and it specializes by allocating different tasks to different parts of the brain as it confronts different situations. According to the neural scientist Joseph LeDoux (1996), "the wiring of the brain at this point in our evolutionary history is such that connections from the emotional systems to the cognitive systems are stronger than connections from the cognitive systems to the emotional systems." The faster automatic and affective processes thus end up dealing with the most urgent issues first. Also, in the case of a sudden change in circumstances, the cognitive processes of the brain react much more slowly than the automatic and emotional processes in the brain. But, after the immediate events are dealt with, the cognitive brain processes begin to play a bigger role in interpreting the new situation.

Biological evolution explains such variations in the brain's specialization: immediate survival required that short-term emergencies were quickly dealt with, regardless of the long-run consequences, while in the long run, more careful planning and more thorough deliberations about costs and benefits were necessary for long-run human survival. For example, the social psychologist Jonathan Haidt (2006) studied lottery winners and found that one year after the elation of becoming rich, lottery winners fall back to their former level of life satisfaction as their brain adjusts — switches from its automatic processes to its deliberative processes — to the new circumstances. Oswald and Powdthavee (2008) found that people who become permanently disabled recover much of their pre-injury level of happiness over time. "It's better to win the lottery than to break your neck, but not by as much as you'd think," concluded Jonathan Haidt (2006). These conclusions may surprise economists, but think about what would have happened to our ancestors over the millions of years of economic hardships, accidents, natural disasters, and violence if they had not been able to adjust and get on with their lives. Therefore, because our short term automatic and emotional reactions to changing circumstances are very different from the more deliberative long-run reactions, economic policies designed to deal with people's immediate desires and fears do not generally maximize humans' lifetime happiness. We therefore cannot describe human behavior with a fixed behavioral function, as economists like to do.

The discovery that specialization within the brain is changeable also means that people react differently at different times and under different circumstances. Furthermore, people also learn to change their behavior by altering the sequence in which different parts of the brain are activated in response to external events. Neuroscientific experiments show that in the case of an unfamiliar problem, many more areas of the brain activate than in the case of familiar and well-understood problems. Experiments have determined that as a person gains experience with a certain situation, the brain's reactions to that situation become more precise and organized. For example, one study tracked the brain activity of floor traders in stock markets, and they found that

experienced traders reacted calmly to the same events that severely agitated novice traders. In sports, a team with some older experienced players often performs better than a young physically superior but less experienced team. And, experienced parents do not react nearly as emotionally to their children's cries as do brand new parents.

The fact that seemingly instinctive behavior can be changed with training and practice explains the important role that education, experience, and culture have in shaping human behavior. Through the many years of upbringing, peer pressure, education, and tacit human interaction, people learn instinctive reactions to complex economic, social, and natural events, just like the floor traders who learned to operate in an environment that inexperienced traders found confusing and taxing. Also, the greater role of cognitive brain functions in the long run permits humans to learn, adapt, and adjust to new cultures.

Neuroscientific research also reveals that people are very conscious of their status in society. Maël Lebreton *et al.* (2009) used brain imaging techniques to distinguish the brain's reactions to social interaction with other people, and they found that the portion of the brain that is stimulated by individual rewards and pleasures is the same portion of the brain that is stimulated by a person's *share* of social rewards and pleasures as well as the perceived pleasures that other people experience. Humans are, therefore, capable of exhibiting **empathy**, which is the ability to experience and understand what others feel. Empathy also affects an individual's sense of happiness. For example, Jean Decety and Claus Lamm (2006) found that when humans take time to conceptualize another person's situation, their own brain's response to their own first-hand experience is reduced in favor of processing the feelings of pain and happiness experienced by others. In general, neuroscientific evidence reveals very clearly that individual happiness depends, to a significant extent, on the well-being of others.

However, research also suggests that human feelings of empathy are not constant or easily predictable. They seem to depend, among other things, on the level of familiarity with other people, whether there is visual contact, and whether the other people behave in culturally familiar ways. Foreigners generally receive much less empathy than people belonging to the same community. And people's sense of empathy has to compete with negative feelings of envy, revenge, and fear, among many other mental reactions. Studies find that even parental behavior towards their own children varies greatly across a range of external circumstances.

All of these findings from philosophy, psychology, and neuroscience make it very clear that simple summary measures like GDP or even the Human Development Index are not reliable indicators for judging how economic activity affects human well-being. But, before we reach any final conclusions about economic activity and human well-being, there is one more area of recent research that we need to examine: survey evidence of how people feel about their own lives.

2.5 Happiness Studies

Given the difficulties in developing simple behavioral functions that can be used to explain and evaluate economic decisions, outcomes, and policies, some researchers have chosen a more direct approach to quantifying human well-being and happiness: simply approach people in their social environment and ask them how happy they are! Actually, consumer research firms and

professional polling organizations have been polling people about their level of satisfaction with life for many years, so we do have quite a bit of accumulated data. Research studies using this survey data on human satisfaction are commonly referred to as **happiness studies**.

One set of such happiness studies are those that have used the results from surveys undertaken by the University of Michigan's *Survey Research Center (SRC)*. These yearly surveys have, for the past five decades, asked people the question:

Taken all together, how would you say things are these days — would you say that you are (1) very happy, (2) pretty happy, or (3) not too happy?

Another source of happiness data are *The World Value Surveys*, a collaborative effort by social scientists in the Netherlands and the U.S. that conducts surveys every few years across a large sample of countries, which ask the question:

Taken all together, how happy would you say you are: (1) very happy, (2) quite happy, (3) not very happy, or (4) not at all happy?

Finally, the level of happiness in Europe is revealed in the annual *Eurobarometer Survey* conducted in the European Union, which asks:

On the whole are you (1) very satisfied, (2) fairly satisfied, (3) not very satisfied, or (4) not at all satisfied with the life you lead?

The average values of these surveys take the form of a number between 1 and 3 for the three-option question by the University of Michigan, and between 1 and 4 for the latter two surveys. These numbers represent a ranking, not an absolute measurement of happiness, because there is no way of knowing precisely how, for example, “very happy” compares to “pretty happy.” Because the surveys also ask the same people other questions about themselves, their social conditions, and their economic situation, it becomes possible to analyze how the responses on happiness vary with these other personal characteristics and living conditions.

Table 2.7 - Time-Series Data on Reported Happiness

<i>United States</i>	<i>1972–1976</i>	<i>1977–1982</i>	<i>1983–1987</i>	<i>1988–1993</i>	<i>1994–1998</i>
Not too happy	14%	12%	12%	10%	12%
Pretty happy	52	54	56	58	58
Very happy	34	34	32	33	30
<i>12 European Countries¹</i>	<i>1973</i>	<i>1983</i>	<i>1997</i>		
Not at all satisfied	4%	6%	5%		
Not very satisfied	16	16	17		
Fairly satisfied	58	59	59		
Very satisfied	22	19	19		

¹ Belgium, Denmark, France, West Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and United Kingdom.

Source: Eurobarometer; taken from David G. Blanchflower and Andrew J. Oswald (2000).

2.5.1 Country survey data

Table 2.7 presents data from annual surveys on happiness in the United States and in a sample of European countries. This data is what statisticians call **time-series data**, because it consists of data observed along a series of points in time, years in this case. Specifically, Table 2.7 shows the responses by people who were asked about how happy they were in several different years. Notice how the proportions of people in each of the categories barely changed at all between 1972 and 1998. If anything, the data suggests that the proportion of people who classify themselves as very happy or very satisfied declined slightly from 1972 to 1998, a period when real per capita GDP increased by about 70% in the United States and more than 100% in Europe. There certainly is no indication that people felt much happier as their incomes rose over nearly three decades.

Also interesting are the findings from happiness studies for Japan over the post- World War II years. The series of annual survey responses by Japanese citizens did not reveal any increase in personal happiness over the four decades between 1950 and 1990 — the period of the so-called “economic miracle — when the Japanese economy increased per capita real GDP six-fold! The survey results are illustrated in Figure 2.2 is taken from Frey and Stutzer, (2002, p. 9): As Japanese per capita real GDP consistently increased, the average life satisfaction index remained about the same.

Studies that have looked at a large sample of different countries at a given point in time, which we call **cross-section data**, do seem to suggest that life satisfaction or happiness is positively related to income. However, the relationship is not linear. Figure 2.3, also taken from Frey and Stutzer (2002), suggests that the level of income positively affects human happiness in countries with annual incomes under \$5,000. But, once average income surpasses \$5,000, there is not much variation in how satisfied people are with their lives. The average satisfaction with life for people with incomes of \$10,000 per year is not much different from the life satisfaction in a country with an average per capita income of \$30,000 or higher. Another study of a large number of countries for an extended period from 1960 through 2005 by Rafael Di Tella and Robert MacCoulloch (2008) confirms the lack of effect of income on happiness after basic needs are met, which it estimates occurs at a level of GDP per capita that prevailed in Europe at about 1960; Maddison (2006) estimates 1960 European GDP per capita at \$7,000 in the 1990 dollars used by Frey and Stutzer.

There have been several statistical studies published after 2000 that seem to contradict the conclusion that real income has no effect on happiness in high income countries. These studies

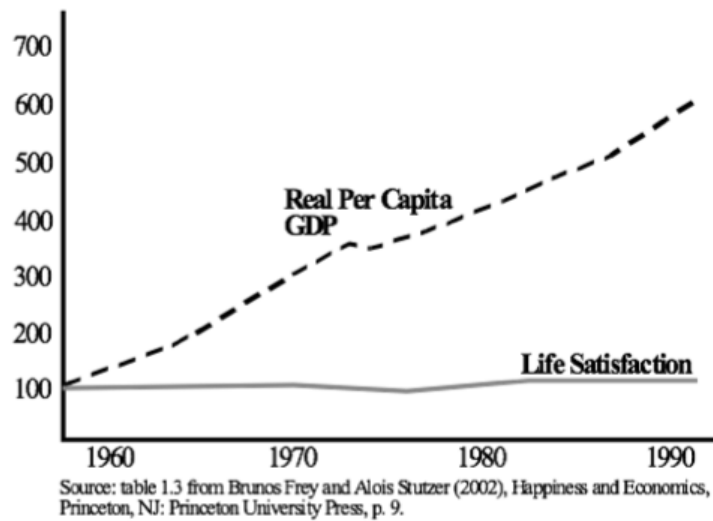


Figure 2.2 - Life Satisfaction and GDP in Japan

did not compare levels of income and happiness; rather, they compared reported happiness and the annual change in income. They found that even in high income countries people reported higher levels of life satisfaction or happiness when they experienced increases. But when Richard Easterlin et al. (2010) carefully differentiated between shifts in happiness during short-run business cycles versus the long run that covers several economic expansions and contractions, they found no statistically significant correlation. Hence, the statistical finding by some studies that the *level* of happiness is correlated with *increases* in real GDP is most likely due to short run effects of increased income on happiness — people are happier during economic expansions than they are during economic contractions. The statistical relationship fades over the long run, however.

Figure 2.3 - Cross-section Happiness Data

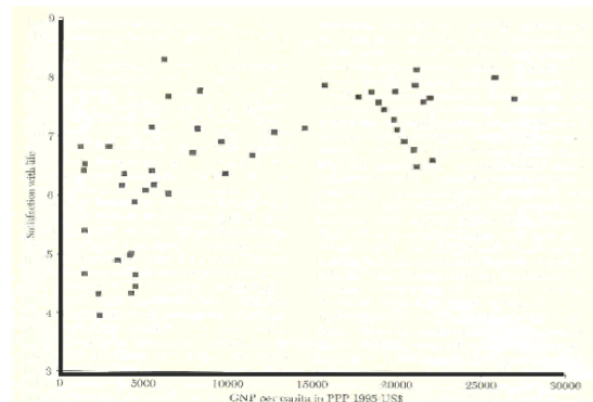


Table 2.8 - Cross Section Data on Individual Happiness in Europe and the U.S.

<i>United States</i>	<i>Lowest</i>	<i>Income Quartiles:</i>		
		<i>2nd</i>	<i>3rd</i>	<i>Highest</i>
Not too happy	18.28%	13.20	8.56	5.81
Pretty happy	57.43	58.07	57.53	52.48
Very happy	24.28	28.73	33.91	41.71
<i>12 European Countries¹</i>				
Not very/not at all satisfied	28.58%	21.10	16.48	12.47
Fairly satisfied	49.52	54.54	56.71	54.96
Very satisfied	21.90	24.36	26.81	32.58

¹ Belgium, Denmark, France, West Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and United Kingdom.

Source: Eurobarometer; taken from David G. Blanchflower and Andrew J. Oswald (2000).

2.5.2 Cross-section surveys

The time-series data on happiness do not give the complete story, however. **Cross-section studies** that compare people from different income groups within one country at the same point in time — a specific year in this case — suggest that on average rich people are happier than poor people. Table 2.8 shows how average levels of happiness differ across income groups within individual countries. The lowest income *quartile* (25 percent of the population at the bottom of the income distribution) contains the highest proportion of people reporting they were “not too happy” in the United States and “not very happy” or “not at all happy” in a group of European coun-

tries. Nearly 20 percent of the poorest Americans were not happy, but only 5 percent of wealthy Americans were not happy. Less than 25 percent of poor Americans, but over 40 percent of wealthy Americans, were very happy. All other things equal, rich people are more likely to be happy than poor people.

2.5.3 Summarizing the country happiness data

In sum, the data from surveys of human happiness reveals that:

- At a given point in time within the same country, people with higher incomes are happier, on average, than people with lower incomes.
- In the long-run, in high-income developed countries average human happiness does not change much as real average per capita income grows.
- Cross-section studies that compare average national levels of happiness for low-income developing and high-income developed countries show that overall happiness rises with average per capita income only until real per capita income reaches about \$10,000.
- It seems that, at least in middle- and high-income societies, relative status, not individual income, explains the variations in reported human happiness.

2.5.4 Statistical regression studies of happiness

Many studies have used happiness survey data in statistical regression equations to estimate and compare the influence of alternative hypothesized determinants of human happiness or life satisfaction. These survey results allow us to relate changes in the happiness index number to hypothesized determinants of happiness such as income, health, age, marriage status, gender, educational achievement, and myriad other human conditions.¹⁰

Typical of such happiness studies is the paper by David Blanchflower and Andrew Oswald (2000), who used survey data from the Michigan Survey for the United States and from the Eurobarometer survey for the United Kingdom over the period 1972–1998 to explain the variations in individual happiness for people with different personal characteristics. They estimated whether (1) age, (2) gender, (3) race, (4) marital status, (5) employment status, (6) student status, and (7) the presence of a spouse had an effect on a person's reported level of happiness. Table 2.9 presents the regression results for both countries.¹¹

¹⁰ Results of these surveys are in the World Database of Happiness, Center for Happiness Studies, Erasmus University, Rotterdam, Netherlands, available at <http://www.eur.nl/fsw/research/happiness>.

¹¹ A survey of many happiness studies for other countries, time periods, and data sets by Dolan, Peasgood, and White (2008) fully confirm Blanchflower and Oswald's findings. Among the many authors surveyed are Ruut Veenhoven (1988), Richard Easterlin (1995), Ed. Diener, Marissa Diener, and Carol Diener (1995), Oswald (1997), and Bruno Frey and Alois Stutzer (2000). This growing literature has, so far, strengthened the conclusions outlined in the text above.

Table 2.9 - Happiness Regressions for the U.S. and the U.K.: 2000

	<i>United States</i>	<i>United Kingdom</i>
Age	-0.0220	-0.0424
Male	-0.1595	-0.1555
Black	-0.4494	-
Unemployed	-0.8321	-1.1337
Retired	-0.0410	-0.0371
Student	0.1245	0.0141
2 nd marriage	-0.1063	-
Widowed	-1.1109	-0.2894
Divorced	-0.9874	-0.6061
Separated	-1.2523	-0.6531
Never Married	-0.7384	-0.7830
Married	-	0.3972
Education	0.0482	

¹ Belgium, Denmark, France, West Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and United Kingdom. Source: Eurobarometer; taken from David G. Blanchflower and Andrew J. Oswald (2000).

In both the United Kingdom and the United States, people are less happy, all other things equal, when they are unemployed, not married, older, male rather than female, retired, or have lost their spouse. Blanchflower and Oswald's statistical results suggest that, in order to achieve greater happiness, people should get married, stay married, stay employed, become educated, never retire, and males should contemplate a sex change. The negative coefficients shown in Table 9 for being widowed, divorced, or separated no doubt reflect the human need for friendship and company. The large negative coefficients for unemployment need an explanation. Helena Lopes (2011, p. 70) provides some insight: "... if organized in the right way, work provides people with the opportunity to satisfy needs essential for well-being, such as the need for self-realization, the need for relatedness and the need to live a meaningful life." She cites evidence from behavioral economics showing that income for consumption is not the sole purpose of work. For most people, being productive and producing something that society recognize as valuable seems to give meaning to one's life.

There have been many more studies like that of Blanchflower and Oswald. Dolan, Peasgood, and White (2008) combined the results of a large number of such studies for different countries, time periods, and data sets, and they find statistically significant relationships between reported individual happiness and a) gender, b) friendship, c) age, d) marital status, e) education, f) health, g) relative income, h) self-employment, i) blood pressure, j) regular sex with the same partner, k) political leaning, l) religious beliefs, m) membership in organizations, n) volunteer work, and o) regular exercise. In short, happiness studies confirm that people value their individual health, but they mostly care about social participation, economic participation, status, and the respect of others. The evidence clearly shows that people are social animals. They exhibit individual self-interest when it comes to where they stand in reference to others, but they value their social relations. Their individual well-being depends on the well-being of others. And, people's well-being is affected by what happens throughout the economic and social systems.

2.6 Net Domestic Product: Economic, Social, and Natural Reproduction

There is still one more flaw in the logic of GDP that we must confront, a flaw that unequivocally invalidates GDP and the alternative measures, like the Human Development Index, that build GDP into their calculations. Recall that we related GDP to the circular flow diagram by equating GDP with aggregate demand $Y = C + I + G$ shown in the circular flow diagram. This inclusion of total investment in GDP constitutes a serious logical error.

Total investment consists of the value of all capital goods produced in the economy. And, from a macroeconomic policy perspective, such production employs labor and other factors of production. This is important information for policymakers because keeping workers employed is a very worthy macroeconomic goal. However, when we use GDP as a measure of human well-being, the inclusion of gross (total) investment is misleading because a substantial share of the new capital goods produced do not directly increase human well-being; they merely replace existing capital that wears out. Economists refer to this “wearing out” as **depreciation**.

2.6.1 Economic reproduction

The 19th century French economist, Frédéric Bastiat, described the case where a young man recently fired by a local shopkeeper heaves a rock through the front window of the shop, completely shattering the expensive glass pane. An observer on the street immediately declares: “Well, this is a good day for the glazer.” And so it was, for the glazer was well paid to repair the window. In fact, French GDP went up by the value of the glass and the glazer’s services, further giving the impression that the rash young man’s action was good for the economy. That makes little sense, of course, because the day ends with the same window in place. The time spent by the glazer could have been spent actually putting in a window where there had been none before.

The breaking of the glass is an example of the depreciation of capital. Other examples of depreciation and new investments that leave the total stock of capital as it was includes the scrapping of your 20-year old car and buying a new one, implosion of an old apartment building and its replacement by a new housing complex, and every 10 or 15 years calling the plumber to replace the water heater in your home. Capital is not permanent, it wears out, requires maintenance, and must be replaced periodically. To include this investment in GDP overstates the real value of production because such replacements do not change the economic system’s capacity to produce at all. Of course, not replacing capital that wears out leaves us in a worse situation. An economy will shrink if it does not continually **reproduce** its capital stock. We will refer to the investment — the production of capital goods — that covers depreciation as **economic reproduction**.

2.6.2 Reproduction of nature

The physical capital stock is not the only “stock” of productive resources that society needs to continually reproduce. Environmentalists and ecologists argue that GDP is an inaccurate measure of human welfare because it fails to accurately account for the environmental damage caused by

the production of goods and services. For example, some production damages the ecosystem and reduces nature's capacity to provide renewable resources and critical life-sustaining services. The obvious example of this is global warming, caused by the use of carbon energy and the emission of carbon into the atmosphere.

Nature provides humanity with vital services, such as fresh water, air, fertile soil, and a stable climate, that humans depend on for survival. There is indisputable scientific evidence that human activity is causing global warming, climate change, destruction of the ecosystem, and an unprecedented loss of living species and biodiversity. Human economic activity, the product of the number of people times the amount of material production per person, now requires nature's resources in amounts that nature can provide on a sustainable basis, that is, in amounts that enable nature — the ecosystem — to continually reproduce itself.

Natural resources fall into two categories: (1) **renewable resources** and (2) **exhaustible resources**. Renewable resources are those that nature replenishes after humans make use of them. Nature generates the oxygen that humans breathe, for example. Evaporation, condensation, winds, and gravity distribute water throughout the world after humans put it to use in agriculture, industry, and throughout their communities. Soils are replenished by the decomposition of organic material after humans harvest their crops. Natural processes are resilient, but nature's capacity to provide its life-supporting services are certainly not unlimited. For example, the processes of evaporation, condensation, precipitation, and replenishment of the stores of fresh water take time and have strict capacity limits. In many parts of the world, falling water tables, dry lakes, and empty rivers reveal humanity's overuse of water. There is clearly a limit to how much water is available for human use at any one time. Similarly, when we cut down a forest, we can replant and nurture another to grow in its place. But, again, such restoration takes time. Given the rate of natural growth of trees, there is some maximum rate of recovery of board feet of lumber per year. Another example of the over-exploitation of nature's renewable services is ocean fishing. Fish species that for centuries were a major source of protein for human consumption, such as cod and tuna, have nearly disappeared from areas where they were abundant.

In short, the more intensively we use renewable resources, the more explicit and costly actions we must take to conserve the natural sphere and help nature replenish the resources we depend on for our social and economic existence. We could also improve the efficiency with which we use nature's services, such as eliminating waste during the harvesting, transport, storage, and transformation of nature's products and services into useful products. The human effort necessary to prevent a reduction in nature's renewable resources increases the more intensively we make use of these resources. Like Bastiat's broken window, the added costs of replenishing the soil with fertilizers, pumping water from greater depths because water tables are declining from excessive water usage, and building dams to hold back the rising sea levels caused by melting ice sheets all increase GDP. But, these costs are merely for replacing nature's lost productive capacity due to our overexploitation.

According to a study by the environmental economist Mathis Wackernagel *et al.* (2002):

Sustainability requires living within the regenerative capacity of the biosphere. Our accounts indicate that human demand may well have exceeded the biosphere's regenerative

capacity since the 1980s. According to this preliminary and exploratory assessment, humanity's load corresponded to 70 percent of the capacity of the global biosphere in 1961, and grew to 120 percent in 1999.

Similarly, the World Wildlife Fund (2008) conducted a comprehensive study that estimated that in 2005 the Earth's use of nature's resources exceeded the planet's capacity to reproduce itself by about 30 percent. In 2014, The World Wildlife Fund revised its estimates and found that humanity's demand on the planet's living resources had come to exceed the planet's regenerative capacity by nearly 50 percent.¹² Figure 2.4 illustrates the estimated path of resource use relative to the ecosystem's capacity to reproduce itself. In short, humanity was using water faster than the ecosystem could replenish it, it was destroying living species so fast that extinctions were increasing 100 to 1,000-fold over historic rates of extinction, and, as already pointed out, emitting carbon into the atmosphere more rapidly than the ecosystem could process. Hence, the ecosystem was losing its resilience, and the natural environment in which humanity evolved was changing.

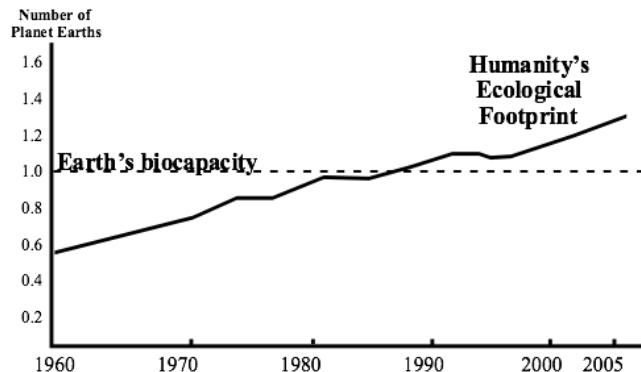


Figure 2.4 Humanity's Ecological Footprint: 1960 - 2005

From a macroeconomic perspective, the destruction of nature and the natural systems that produce the natural services on which human life and human production depends should be accounted for in our measures of economic growth and wealth. The exploitation of nature is causing nature to depreciate, and human societies are, as a whole, not *reproducing* nature generating new technologies fast enough to avoid a decline in natural resources. This failure, in turn, reduces our capacity to produce the, and that implies less productive capacity and output by humans in the future.

Nature can largely reproduce its own productive capacity, but such natural reproduction does require time. Most obvious is nature's provision of fresh water; this requires the time-consuming process of evaporation, condensation (rainfall), and finally gravity's pull to distribute the water across the face of the earth. Maintaining healthy soils requires the growth of plants, their decomposition, and eventually their natural transformation back into soil. And, maintaining

¹² Reported in *Le Monde* (2014), "L'homme dévore 1,5 Terre par an," 1 October.

constant atmospheric temperatures means we must limit the amount of carbon we emit into the air. You can no doubt think of many other examples of renewable natural resources.

In some cases, natural reproduction does not occur; when a natural resource is used up, it is not eventually reproduced by nature. When we pump crude oil out of the ground, it is not replaced — at least not within a time period that is relevant to human existence. When gold is mined, nature does not quickly put a new vein in its place. In the latter cases of exhaustible resources, technological change can mitigate the problem by creating substitutes for the used-up natural resources. Perhaps artificial fertilizers can restore soils to their former productive levels, or, in the case of gold, we can develop paper or digital money to replace gold coins in our monetary system.

Human economic activity is responsible for humanity's ecological footprint rising above nature's capacity to reproduce itself and humanity's capacity to create substitutes for exhaustible resources. Again using the same examples from above, nature has been increasingly blocked from reproducing its soils because with modern agriculture, the plants grown are usually transported far from where they emerged from the soil. Therefore, the dead plant does not return to the soil where it grew. And, the growth of human population and its average use of fresh water — for daily showers, swimming pools, washing cars, watering lawns, etc. — has caused water use to exceed rainfall and river capacity. In many parts of the world, water tables have fallen as people pump more and more water out of the ground. As for exhaustible resources, technological change has only partially been able to substitute new resources for those that have been depleted. In fact, much of our “technological progress” over the past two centuries consisted of using carbon energy, which triggered and drove atmospheric warming, climate change, and so many other natural changes as the earth adjusts to the higher temperatures. We will come back to natural reproduction in Chapter 11; this is an issue that deserves its own chapter.

2.6.3 Social reproduction

A third type of reproduction on which human survival depends is social reproduction. Human societies are also subject to depreciation: people do not live forever, and future generations must be raised to replace those who pass away. The costs of preparing new generations of people are not trivial. Humans require about 20 years to attain full adulthood. If the adults do not produce enough to both survive and to support their children, then the population does not reproduce itself, and the total population declines.

Social reproduction involves more than just replacing people who pass away. People consist of more than a physical body; they also embody knowledge, culture, experience, and social relationships. When an older person dies, the knowledge they acquired, the cultural behaviors they adopted, and the social relationships with other people also perish. This is why it takes so long for humans to raise their offspring: they must be taught many things, they must learn to navigate complex human societies, and they must embrace myriad habits, perspectives, norms, and myriad other patterns of behavior. Childbearing, child nurturing, child education, and socialization are forms of investment that must be undertaken to reproduce the human population over time.

2.6.4 Net domestic product (NDP)

It should be obvious that the economic activities that we call *reproduction* do not add to humanity's capacity to provide for itself. Reproduction of existing productive resources, whether economic, social, or natural, merely replaces what we use up; when reproduction exactly equal depreciation, there is no net gain. Yet, we include many reproductive activities in GDP. For example, we earlier defined GDP to be equal to the sum of consumption, investment, and government purchases, or what we defined as $C + I + G$ in the circular flow diagram of the economy. Investment, of course, is defined as the creation of physical capital, and normally much of this newly created physical capital is used to replace older physical capital that wears out. So, in a strict sense, some component of GDP is not really production that “adds” to the value of products and productive inputs.

Some economists have proposed a measure called net domestic product (HDP), which they would measure simply as GDP minus the expenditures for different forms of capital that merely replaces older capital. Realistically, calculating such a measure is not as easy as it might seem. First of all, we would need to have an accurate measure of the existing stock of capital in the economy, and, secondly, we would need to have an accurate measure of how much of that existing stock of capital actually wore out. We do not have good measures of either. And finally, most new capital is not identical to the older capital it replaces. New machines incorporate newer technologies, they are manufactured differently, and they work differently. How much of a new machine replaces what the old machine did, and how much of the new machine adds to output or quality of output? These things are impossible to quantify precisely.

It should be obvious that it would make sense to try to calculate NDP rather than GDP if we really want to measure how our economy is growing over time or how it is adding to people's well-being compared to other countries. The agencies that calculate GDP seldom do this, however, and for the time being we can anticipate economists using GDP in most of their macroeconomic analyses. But, at least you are now aware of the shortcomings GDP.

2.7 Conclusions and Looking Forward

The major points made in this chapter are:

- The simple welfare function used in neoclassical economics, which takes individual welfare as a specific positive function of the sum of some finite set of consumption items, cannot capture important determinants of long-run human well-being like friendship, dignity, security, good health, participation in productive activity, compatibility with the natural environment, and social status.
- Human well-being depends on relations as well as material things; humans are social animals who evolved to value personal relationships and their social conditions.
- Individual welfare depends on the welfare of the whole society and their position within that society — humans exhibit empathy, love, pride, envy, greed, competitiveness, etc.

- GDP per capita, by itself, is not a very useful indicator for framing economic analysis or designing policies to influence how the economic system performs.
- Per capita GDP is, at best, only partially correlated with human happiness and life satisfaction.
- In rich countries there may be no strong relationship between the two at all.
- On the other hand, substantial gains in well-being can be achieved if many people in a society are raised from living standards that do not satisfy people's basic needs — nourishment, shelter, and personal safety — to living standards where people no longer face hunger, homelessness, violence, or indignity.

If it is true that the mere growth of output of goods and services does little for human well-being or life satisfaction in relatively wealthy countries like the United States, Canada, or France, then we must also question the usefulness of economic policies designed to do nothing more than expand the production of goods and services. In these cases, macroeconomic policies should focus on more narrow goals of, perhaps, expanding certain types of production over other types of production or dealing with issues such as equality, unemployment, or environmental sustainability. On the other hand, in countries where a significant segment of society still lacks basic security, shelter, education, health, and dignified social inclusion, then macroeconomic policy may need policies that both expand overall production and redirect some of that production explicitly to where basic needs are not satisfied.

Reflecting a bit on the evolution of human society over the past few thousand years, it appears that the idea of economic growth is actually a very recent human ambition. For most of human history, life consisted essentially of slight variations around an unchanging level of income that barely provided basic subsistence and survival. People ended life pretty much in the same economic state they were born into, and they expected little change for their children and grandchildren. Long run change was usually too slow for an individual person to notice over the course of their [often short] lifetime. You might ask: Were people less happy thousands of years ago, when there was no apparent upward trend in life's condition? Or, are we really happier today in our world of rapid technological change and growing material consumption? And, why do economists now view an economy with slow growth in per capita GDP as a failure?

John Maynard Keynes, who is best known for developing macroeconomics and macroeconomic policies to address the Great Depression, provided an insightful perspective on the desirability of yet another century of rapid growth of GDP per capita. In an essay written in 1930, just as the world began to fall into the Great Depression, Keynes (1930) said:

Now it is true that the needs of human beings may seem to be insatiable. But they fall into two classes — those needs which are absolute in the sense that we feel them whatever the situation of our fellow human beings may be, and those which are relative in the sense that we feel them only if their satisfaction lifts us above, makes us feel superior to, our fellows.

Keynes recognized that personal well-being depends on both the absolute amount of stuff we have and how much more we have than our neighbor, just as the happiness studies would reveal

many years later. Keynes then argued from his 1930 perspective that if world output grows ten-fold, humanity's absolute needs would be abundantly satisfied. But, because it is impossible for everyone to do better than everyone else, relative gains for everyone would remain as impossible as ever. Amazingly, a ten-fold increase in material production has indeed been achieved in developed economies. But now, twenty years into the 21st century, it is not obvious that humans feel as satisfied as Keynes predicted.

Keynes was convinced in 1930 that the eventual solution to the traditional economic problem of scarcity would create a unique opportunity for humanity:

Thus, we have been expressly evolved by nature — with all our impulses and deepest instincts — for the purpose of solving the economic problem. If the economic problem is solved, mankind will be deprived of its traditional purpose. Will this be a benefit? If one believes at all in the real values of life, the prospect at least opens up the possibility of benefit. Yet I think with dread of the readjustments of the habits and instincts of the ordinary man, bred into him for countless generations, which he may be asked to discard within a few decades.

Thus for the first time since his creation man will be faced with his real, his permanent problem — how to use his freedom from pressing economic cares, how to occupy the leisure, which science and compound interest will have won for him, to live wisely and agreeably and well.

Note that Keynes' focus on the "habits and instincts of the ordinary man" is compatible with what we discussed about human psychology and neuroscientific evidence on how humans think, as well as the happiness survey data. Interestingly, Keynes even suggested that by the beginning of the 21st century the average workweek would be just 16 hours, enough hours of work to satisfy the psychological need to productive work and contribute to society, but few enough hours to leave plenty of free time for people to do what they individually prefer to do.

However, as great an economist as he was, Keynes failed to grasp that the capitalist economic system in place in the 20th century could not survive without continual growth of material production and consumption. Because the political, social, and economic power was — as it always tends to be — in the hands of people whose interests are wrapped up in the current system, capitalist interests have worked very hard to push government, education, advertising, and culture to counter any tendencies for societies to move in the direction of Keynes' predicted less materialistic but, potentially, happier system.

Indeed, this continued growth of material production has not necessarily made humanity happier, but it has definitely led to the emergence of a huge new problem for humanity: environmental catastrophe. Our material growth has caused the depletion of resources, atmospheric warming, climate change, water scarcity, loss of bio-diversity, and many other forms of destruction of the natural ecosystem that human life depends on. Perhaps we will find ways to keep expanding output without completely destroying the natural environment, although so far there is no evidence suggesting we can safely continue doing what we are doing. Or, perhaps we humans will change the way we go about providing for ourselves, as Keynes (1930) seemed to hope:

The strenuous purposeful money-makers may carry all of us along with them into the lap of economic abundance. But it will be those peoples, who can keep alive, and cultivate into a fuller perfection, the art of life and so not sell themselves for the means of life, who will be able to enjoy the abundance when it comes.

The only certain prediction we can make with any degree of certainty is that future economic growth, whatever form it takes, will have to be sustainable. By definition, if something is *unsustainable*, it will, sooner or later, stop.

In one way, the evidence on human happiness is reassuring: We humans can be perfectly happy without growth. We could even become happier without any growth of material production if we would distribute the rewards from work more evenly, leave time for much more leisure, enhance social interaction, and stabilize the economic system to where it provides for our needs in a more stable and reliable manner. But, will our current capitalist economic system, driven by the pursuit of ever more profit, permit such a transition toward sustainable economic and social structures? We will see.

Key Terms and Concepts

Civil rights	Exhaustible resources	Human Development Index (HDI)
Consciousness	Expected individual lifetime welfare (EILW)	Natural reproduction
Convergence	GDP per capita	Net Domestic Product (NDP)
Cross-section data	Gross Domestic Product (GDP)	Renewable resources
Depreciation	Gross National Product (GNP)	Social reproduction
Divergence	Happiness Studies	Sustainable development
Earnwork	Hierarchy of needs	Time-series data
Economic freedom	Human capital	Uneconomic growth
Economic reproduction		

Questions and Problems

1. Many social scientists have interpreted the evidence on happiness as confirming the need for government action to change the social and natural environments we reside in. Is such an interpretation correct? Precisely explain your yes or no answer.
2. What is the secret to happiness? Base your answer on the available evidence from behavioral economics, psychology, happiness studies, neuroscience, and any other scientific sources you can find.

3. Is work a cost or a benefit? What does orthodox economic theory suggest? What do happiness studies suggest?
4. Write a brief essay describing the advantages and disadvantages of using the growth of GDP per capita to represent economic development. Why do you think economists use this measure so often? What else should they use?
5. Describe the Human Development Index developed by the United Nations. Is this a better measure of human or social welfare than GDP? Why or why not?
6. Explain in detail the measure called *Expected Individual Lifetime Welfare (EILW)*. Is this an improvement on GDP per capita or not? What are its shortcomings as a measure of human well-being?
7. Discuss the assumption about the relationship between per capita income and human welfare that lies behind the Human Development Index calculated by the United Nations. Specifically, explain how the assumption changed with the 1999 index. (Hint: use Figures 2.5 and 2.6 to illustrate your answer.)
8. How would you define *happiness*? Use this definition to explain how much a doubling of your income would contribute to your happiness. How well do your perceptions of what makes you happy coincide with the description of findings from happiness studies and psychology?
9. Do the measures of economic development discussed in this chapter account for the depletion of natural resources and the environmental damage that is beginning to manifest itself in the form of climate change, species losses, depletion of the ecosystem's critical life-support services, and simple congestion? Discuss how ecological destruction could be incorporated into measures of economic development.
10. Do you think people have economic rights, such as the right to healthcare, education, or employment? Why or why not? Does your answer influence which of the available measures of economic development you would prefer to use? Explain your thinking.
11. Explain the terms Earnwork and Volwork introduced by Robert Fogel. Are both of these categories of human activity included in GDP? Which should be included in the measure of human well-being that we use to calculate the rate of growth of economic development? Explain.
12. One of the difficulties in coming up with a single measure of economic well-being is that it requires some type of aggregation of individual measures. Given that human beings are social animals who value both individual well-being and social status, is it possible to just add up individual measures to derive a national measure of well-being? Discuss.
13. "Social connectedness" shows up as a positive contributor to human happiness in the many happiness studies. For example, people who are married and employed are happier than single and unemployed people. How could measures of social connectedness be incorporated into summary measures of social well-being?
14. Write a brief essay describing the advantages and disadvantages of using the growth of GDP per capita to represent economic development. Why do you think economists use this measure so often? What else should they use?
15. One of the difficulties in coming up with a single measure of economic well-being is that it requires some type of aggregation of individual measures. Given that human beings are social animals who value both individual well-being and social status, is it possible to just add up individual measures to derive a national measure of well-being? Discuss.

16. Why have hours worked not fallen very much in countries like the United States despite large increases in real income?
17. Write an essay explaining why humans seem to have such difficulty accepting the scientific evidence on global warming and biodiversity loss. (Hint: focus on the nature of these two phenomena, especially their complexity, their long-term nature, and the difficulties of perceiving their consequences in our capitalist market economy.)
18. Explain the three forms of reproduction that a sustainable human society must carry out. Are we doing this, and are we a sustainable society?

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