Economics 100

Answers to Homework #5

Due November 19, 2013

**Directions:** The homework will be collected in a box **before** the lecture. Please place your name, TA name and section number on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade. Late homework will not be accepted so make plans ahead of time. **Please show your work.** Good luck!

**Please realize that you are essentially creating “your brand” when you submit this homework. Do you want your homework to convey that you are competent, careful, professional? Or, do you want to convey the image that you are careless, sloppy, and less than professional. For the rest of your life you will be creating your brand: please think about what you are saying about yourself when you do any work for someone else!**

1. In your own words explain what the retirement poverty problem is and what the retirement uncertainty problem is. Then, reflect on the class lectures on retirement planning and write a brief (no more than three paragraph essay on what you found interesting, intriguing, thought provoking, new information to you and/or worrisome about that topic.

Answer:

The retirement poverty problem refers to the problem of providing retirement funds to those who are too poor during their working lives to be able to save a sufficient amount of money to cover their living expenses once they are no longer working.

The retirement uncertainty problem refers to the problems associated with the uncertainties of retirement: how much money will I need to retire; how long will I live once I am retired; will I or my significant other incur significant health costs in retirement; what will be the return on the funds that I set aside for retirement expenses?

Your response on the question of what you found interesting, etc. with regard to the lectures on retirement will obviously vary. But, here are some of the observations I hope you may be led to make:

* It takes a lot of discipline and a lot of delayed gratification to save enough to finance your own retirement
* There is a lot uncertainty surrounding issues of being able to afford your retirement years
* Social Security is an income transfer program: people currently working are providing the funds that currently retired people are living on
* Social Security implicitly involves a social contract where the current workers in the economy take care of retired workers and these workers expect the next generation to continue to honor this social contract
* If you are going to self-finance your retirement and also take care of people who are close to retirement (those who have paid into Social Security for many, many years) it is going to be very expensive for you
* Managing your own retirement savings plan is difficult and many people may lack the skills and wisdom to do this well
* The “choice architecture” or the design of the retirement program offered as a Defined
Contribution Plan is important if you care about large percentages of people actually participating in these plans
* Actively thinking about the “choice architecture” is important: explicitly or implicitly, you are making a choice about the design choice-here paternalism may give us better outcomes than we would otherwise get

2. Many companies, including insurance companies, worry a great deal about two types of asymmetric information problems: adverse selection and moral hazard. Moral hazard refers to behavior that one party engages in after the transaction is made that is potentially hazardous in its impact on the other party to the transaction. For example, if you borrow your parent’s car on the day you get your driver’s license and then go out and drive 80 miles per hour you are acting in a morally hazardous manner toward your parents: they have agreed to lend you their car and now your behavior puts at risk the car (if you crash its worth may be completely lost) and your life (something that most parents value very highly). For each of the following scenarios determine what the morally hazardous behavior is.

a. Howard, has just gotten approval for his health insurance coverage at his place of employment. Howard decides that he will take up chain smoking and heavy drinking after getting this coverage.

Answer:

Howard’s personal choices about smoking and drinking are likely to increase the cost of providing medical care for him. His insurance company having provided him with insurance based upon his health habits will view these new health habits as potentially hazardous to them since they will likely result in the insurance company having higher costs to provide Howard with health insurance. Howard is acting in a morally hazardous manner toward his insurance company.

b. Susie has a car insurance policy that covers her use of any kind of motorized vehicle. Susie decides that now that she is insured she will trade her Volvo for a Ferrari.

Answer:

When Susie got her car insurance policy its premiums were based upon her driving a relatively heavy, slow, very safe car and now she wants to start driving a “souped-up” sports car capable of going at very high speeds. Susie’s probability of an expensive accident that the car insurance company will have to pay out coverage for increases when she switches from the Volvo to the Ferrari. Susie is acting in a morally hazardous manner toward her insurance company.

c. Bank of Midfield has deposits from many different depositors who earn a low rate of return on their deposits at the bank. Bank of Midfield uses these deposits to provide mortgages to borrowers, to buy different financial assets, and to make a variety of investments which they hope will result in higher returns than they must pay to depositors: in this manner, Bank of Midfield can hope to earn profits as a banking institution. Bank of Midfield has deposit insurance with the FDIC (Federal Deposit Insurance Corporation) which means that should the bank fail, all depositors will get the full amount of their deposits back due to the government’s guarantee of these deposits. Currently, Bank of Midfield knows it has made a number of bad investments (think mortgages that will likely not be repaid and where the value of the house has fallen below that of the mortgage) and that it is bankrupt, but the bank examiners have yet to discover this. So, Bank of Midfield is pursuing a very aggressive campaign consisting of investing in much higher risk, but much higher potential return (or loss), than their more normal investment strategy.

Answer:

Although you might be tempted to think that Bank of Midfield is acting in a morally hazardous manner toward its depositors, you need to remember that these depositors will not lose anything if the bank fails due to the presence of FDIC insurance on the bank deposits. If the bank fails, the individuals that will be hurt are the taxpayers that reside in this economy since they will have to pay greater taxes to cover the losses incurred by the bank. FDIC insurance is very effective at preventing bank runs (where individuals hear a rumor and on the basis of that rumor decide to remove their funds en masse) but it does create a significant moral hazard problem. An effective way to deal with this moral hazard problem is to require bank owners to have capital (net worth) in the bank so that the bank owners if the bank becomes insolvent will lose their own funds. This will tend to make the bank owners more prudent in the type of loans they are willing to make.

3. Many companies, including insurance companies, worry a great deal about two types of asymmetric information problems: adverse selection and moral hazard. Adverse selection refers to behavior that one party engages in before the transaction is made that results in the pool of applicants that the other party faces being “adversely selected” from the other party’s perspective. For example, in the case of healthcare insurance the individual seeking insurance knows more about their general health and well-being than does the insurance company: it is likely that the pool of people seeking healthcare insurance is adversely selected from the perspective of the insurance company since it is likely that the pool will be a less healthy pool than the general population. For each of the following scenarios determine whether there is an adverse selection problem or a moral hazard problem. Explain your answer.

a. Healthy Choices Insurance Company offers health insurance to young people under age thirty. Their premiums for this health insurance is quite reasonable based upon the company assuming that most young people under thirty will likely have low health care costs. Healthy Choices Insurance Company is surprised at the end of the year to find that their costs exceed their revenues by a significant amount.

Answer:

The problem Healthy Choices Insurance Company faces is that the pool of young people who are most likely to sign up for the insurance plan is a pool that is adversely selected: young people who know that they are at risk of high health care costs will find it advantageous to sign up for the plan while young people that are healthy and less apt to incur significant health care expense will decide to self-insure.

b. Bob meets with a life insurance representative and answers a battery of questions attesting to his health status and his mental state. The life insurance representative provides Bob with a life insurance policy that promises to pay Bob’s beneficiaries $200,000 if Bob dies during the current year. The day after the policy is issued Bob commits suicide.

Answer:

Bob’s suicide occurs after the transaction (the life insurance policy) has been made: the life insurance company views Bob’s actions as morally hazardous to the company since it results in higher costs than the company anticipated based on their screening of Bob. This very real potential for moral hazard in the life insurance market leads life insurance policies to typically have a clause exempting them from paying out in the event of a suicide in the first six months to a year that they policy is in effect. This is to prevent an individual from misrepresenting the status of their health with regard to potential suicide risk in order to then create a situation where their beneficiaries can benefit from their untimely death.

c. Jenny when she moved to Madison needed to set up a checking account at a local financial institution. She selected her bank by choosing the one that was located closest to campus. Jenny did not check out the bank’s financial statement, its solvency, its Board of Directors, or anything having to do with how well the business operated. Jenny reasoned that her account would be protected by the FDIC, the Federal Deposit Insurance Corporation, or the NCUA, the National Credit Union Association, should her institution become financially insolvent.

Answer:

Jenny’s behavior represents a potential moral hazard problem not for herself or the financial institution, but for the taxpayer who ultimately has to stand behind the financial guarantees of the FDIC and the NCUA.

d. Bobby is out of money and out of work, but he thinks he can get dressed up and pose as a good loan candidate at his local bank. He doesn’t really care what the interest rate on the loan is as long as he can get the loan.

Answer:

Banks always need to be concerned about whether the people asking for loans at their banks are adversely selected: that is, are these people likely to not pay back their loans (that is, are they likely to default on their loans). Banks work to evaluate this by having a would-be loan applicant provide information about their assets, their liabilities, their work history, their current salary, their credit report, etc. If the individual banks at the bank, the bank also has access to their account history so that they can evaluate what kind of loan risk the individual represents. As currently worded this is an adverse selection problem, but if the bank actually makes the loan then Bobby may represent a moral hazard problem for the bank since he is likely to have no intention of repaying the loan if he gets it.

4. For each of the following scenarios determine the effect on GDP in 2013 of the described event. Then, explain the reasoning behind your answer.

a. Mary’s Tops produces 1000 spinning tops in 2012 and sells 800 of these tops in 2012 for a price of $8 per top. In 2013 Mary’s Tops produces another 1000 tops and sells 1200 tops in 2013 for a price of $8 per top.

Answer:

In 2013 the effect of Mary’s activities on GDP will be $8,000 since in 2013 the new production is 1000 tops with each top having a value of $8. The additional 200 tops sold in 2013 were counted in GDP in 2012 since they were produced in 2012. In 2012 the 1000 tops got valued as $6400 in consumption expenditure and $1600 in inventory expenditure (a part of investment spending). In 2013 the 1200 tops were valued as $9600 in consumption expenditure and -$1600 in inventory expenditure (a part of investment spending).

b. Bart’s Marketing in 2013 decided to expand the business and to do this it needed to raise financial capital. The company issued 200 shares of stock and sold these shares for $50 per share. The business expansion is slated to begin sometime in mid-2014.

Answer:

This transaction has no effect on GDP in 2013 since it does not represent any kind of production that has occurred.

c. Sammy and Joan live next door to each other and they each have two children that are under the age of five. During the week Sammy looks after Joan’s children and on the weekend Joan looks after Sammy’s children. The value of these childcare services is equal to $300 per week for each household. Sammy and Joan, recognizing that the value is equivalent for both of them, do not actually write each other a check in payment for the services and they do not record this income on their respective tax returns.

Answer:

Although there is productive activity going on here (the minding of children is work!), the productive activity is not going through a legal market. We know this because neither Sammy nor Joan is reporting this activity on their tax returns. Hence, even though there is productive work going on GDP in 2013 is not affected. This example should make us pause and reflect on the many instances when productive work is not included in GDP: GDP figures may have a tendency to grossly under report important productive activities in an economy.

d. Harry and Megan live next door to each other and they each have two children that are under the age of five. During the week Harry looks after Megan’s children and on the weekend Megan looks after Harry’s children. The value of these childcare services is equal to $300 per week for each household. Harry writes Megan a check each week for fifty weeks (two weeks both households are on vacation) and Megan writes Harry a check each week for fifty weeks. Both Megan and Harry comply with all income tax regulations and social security regulations with regard to reporting this income.

Answer:

Harry earns ($300 per week)(50 weeks) = $15,000 as does Megan. The total of $30,000 gets counted as GDP in 2013 since the income is reported on income tax returns.

e. Elizabeth has a vase she purchased in 1995 for $55 that was created in 1890. In 2013 she realized that the vase needed repair after years of heavy use. She took it in to “Dr. Phil”, a local fine art restorer, who re-glued and repaired the vase. The bill for this work was $115.89.

Answer:

In 1995 Elizabeth purchased the vase for $55, but this sum did not affect the GDP for 1995 since the expenditure did not reflect new production but just an exchange of ownership of existent production. The value of the vase was part of GDP in 1890 when it was produced. But, in 2013 Elizabeth did get the repair of the vase done and this reflected new production. So, the value of $115.89 is credited to GDP for 2013.

5. Suppose you are told that in the economy of Millsville that rent payments for land resources are equal to $100 million in 2010, interest payments for capital are equal to $150 million in 2010, consumer expenditures on goods and services are equal to $320 million in 2010, profits are equal to $50 million in 2010, government expenditures on goods and services are equal to $90 million in 2010, and net exports are equal to -$20 million in 2010. You also know that in Leesville in 2010 that wage income was two times bigger than the level of investment spending on goods and services during that same year. Determine the level of GDP in Millsville in 2010, the level of wage income in 2010, and the level of investment spending in 2010. In determining these levels verbally describe how you are finding these answers and in your verbal description make specific reference to the definition(s) of GDP you are using to find the answers.

Answers:

To find these three measurements-GDP, I and wages-it is helpful to first organize the data you have been given. In your organization it is worth thinking about the various definitions of GDP: in particular, it is helpful to think about the factor payment approach to GDP measurement as well as the expenditure approach to GDP measurement. Recall the following:

Factor payment approach: GDP = wages + interest + rent + profits

Expenditure approach: GDP = C + I + G + (X – M)

Looking at the data we have:

Factor payment approach: GDP = wages + 150 + 100 + 50 or GDP = wages + 300

Expenditure approach: GDP = 320 + I + 90 + (-20) or GDP = 390 + I

GDP should be equivalent using these two different methods of measurement, so we can write:

Wages + 300 = 390 + I or Wages = 90 + I

Looking at the given data we also know the relationship between wages and investment: wages = 2I or I = (1/2)wages. So, use this equation to substitute into the first equation:

Wages = 90 + (1/2)(wages)

(1/2)(wages) = 90

Wages = $180 million

Investment = $90 million

Factor payment approach: GDP = wages + 300 = 180 + 300 = $480 million

Expenditure approach: GDP = 390 + I = 390 + 90 = $480 million

6. Consider the community of Richville. There are two hundred people who live in Richville and your task is to answer the following set of questions based on the information below:

* In Richville there are 40 people who are less than 16 years old
* In Richville there are 30 people who are over 70 years old and are fully retired
* In Richville there are 15 people who are currently not working, are available to work, and have submitted job applications during the past four weeks
* In Richville there are 20 people who are currently not working, are available to work, but who have given up submitting job applications because they do not believe there is any work to be had in Richville
* In Richville there are 50 full-time college students who are not currently seeking work
* In Richville there are 25 people who are working part-time but who would like to work full-time
* The rest of the Richville population is over 16 years old and currently working

a. What is the number of employed people in Richville? Explain how you got your answer.

Answer:

The number of employed people in Richville includes all those individuals who are 16 years old or older and who are currently working, whether working part-time or full-time. Thus, the number of employed people in Richville is equal to the 25 part-time workers plus the 20 full-time workers. To get the 20 full-time workers you need to start with the total population of Richville which is 200. Then subtract out the 40 children, the 30 people who are retired, the 20 people who are not working but who have also given up searching for work, the 15 people who are not working but who are still seeking a job, the 50 college students, and the 25 part-time workers. The total number of employed people in Richville is 45 people.

b. What is the number of unemployed people in Richville? Explain how you got your answer.

Answer:

The number of unemployed people in Richville includes all those individuals who are 16 years old or older and who are currently not working, but who are available to work and who are also actively looking for a job. All three of these criteria must be met to be considered unemployed. Thus, in Richville the number of unemployed is equal to 15 people.

c. What is the labor force equal to in Richville?

Answer:

The labor force is defined as the number of employed plus the number of unemployed. In Richville the labor force is therefore equal to 60 people.

d. What is the unemployment rate in Richville? Show how you found your answer.

Answer:

d. The unemployment rate is equal to [(the number of unemployed)/(labor force)] \* (100%). In this case we have that the unemployment rate is equal to [(15)/(60)] \* 100% = 25%.

e. How would the unemployment rate change in Richville if discouraged workers were counted as unemployed workers? Verbally describe how the unemployment rate would change and then calculate a numeric value based on this change in the definition of unemployment.

Answer:

e. If discouraged workers were counted as unemployed workers this would cause the unemployment rate to increase. In this example, changing the definition of unemployed so that it includes the discouraged workers would cause the number of unemployed to increase by 20 to 35 people; it would also cause the labor force to increase by 20 to 80 people. Thus, the unemployment rate with this change would equal [(35)/(80)] \* 100% or approximately 43.75%.

f. How would the unemployment rate change in Richville if part-time workers were counted as unemployed workers rather than employed workers? Verbally describe how the unemployment rate would change and then calculate a numeric value based on this change in the definition of unemployment.

Answer:

If part-time workers were counted as unemployed workers this would cause the unemployment rate to increase. In this example, changing the definition of unemployed so that it includes the part-time workers would cause the number of unemployed to increase by 25 to 40 people; it would not affect the labor force which is equal to 60 people. Thus, the unemployment rate with this change would equal [(40)/(60)] \* 100% or 67%.

7. For each of the following scenarios decide whether the person is employed or unemployed. Explain the reasoning behind your answers.

a. Joe will turn sixteen on June 6, 2013. He currently works at a local fast-food restaurant twenty hours a week.

Answer:

Joe is not necessarily in the labor force: it depends upon what you assume the current date is. If you assumed the current date is before 6/6/13 then Joe would not be included in the employment statistics since he is not yet 16. If you assume the date is after 6/6/13 then Joe would be 16, he would be considered employed since he is working for pay.

b. Mary is eighteen years old and works in her family’s restaurant business twenty hours a week. She does not get paid for this work.

Answer:

Mary is employed since she is 16 years old or older. She does not need to be paid in the family business in order to be considered employed. She just needs to work 15 or more hours a week.

c. Jordan volunteers at a local food pantry twenty five hours a week. He is otherwise in school full-time. Jordan is twenty years old.

Answer:

 Jordan is not in the labor force (neither employed nor unemployed) since volunteer activity, although valuable, is not considered employment.

d. Vince is currently out of work but is looking for work. However for the next four weeks he will be on an extensive family vacation that will take him away from the town where he lives. Vince is thirty five years old.

Answer:

 Vince is not in the labor force (neither employed nor unemployed). To be unemployed Vince must be i) out of work; ii) available for work; and iii) actively applying for jobs. Vince meets the first and third criteria, but he does not meet the second criteria since he will be unavailable for work over the next four weeks while he travels.

e. Leann is currently out of work, is available for work and is looking for work but has recently had trouble finding any possible positions that would suit her skills and interests. She last filled out an application for a potential job in January 2013 and it is now June 2013. Leann is forty five years old.

Answer:

Leann appears to be unemployed, but she fails the three criteria to be categorized as unemployed (see the answer to (d)) since she is not actively submitting applications. To be considered unemployed you must have submitted a job application within the last four weeks: Leann does not meet this standard. She does meet the standards of i) being out of work and ii) being available for work.

f. Michael is currently working twenty hours a week but would prefer to be working full-time. He has submitted applications for potential jobs in the last four weeks but has not found anything that is full-time yet. Michael’s birthdate is 8/15/1998.

Answer:

Michael is only fifteen years old. So, even though he has a job he is not considered employed because he is not 16 years old or older. He is also not considered unemployed since he is not at least 16 years old.

g. Cory works for a local auto body shop for forty hours a week. Cory is twenty six years old. Cory has been on vacation for the past two weeks and has not been to the auto body shop to work during this time.

Answer:

Cory is considered employed even though he has been on vacation from his job. He is over 16years old and he has a paid position with a company.

8. Suppose that an economy consists of only two types of final goods: computers and automobiles. Sales and price data for these two goods for two different years are as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Quantity of Computers Sold | Price per Computer | Quantity of Automobiles Sold | Price per Automobiles |
| 1990 | 500,000 | $6,000 | 1,000,000 | $12,000 |
| 2013 | 5,000,000 | $2,000 | 1,500,000 | $20,000 |

a. Nominal GDP in any year is calculated by multiplying the quantity of each final good sold by its price and summing over all final goods. Calculate nominal GDP in 1990 and in 2013.

Answer:

Nominal GDP in 1990 = $6,000\*500,000 + $12,000\*1,000,000 = $15 billion;

Nominal GDP in 2013 = $2,000\*5,000,000 + $20,000\*1,500,000 = $40 billion.

b. Real GDP in any year is calculated by multiplying that year’s quantity of each final good sold by its price in the base year and summing over all final goods. Using 1990 as the base year, calculate real GDP in 1990 and in 2013.

Answer:

Since 1990 is used as the base year, real GDP in 1990 is equal to nominal GDP in 1990.

Real GDP in 2013 = $6,000\*5,000,000 + $12,000\*1,500,000 = $48 billion.

c. Calculate the percentage change in the real GDP between 1990 and 2013 using 1990 as the base year

Answer:

The percentage change in the real GDP between 1990 and 2013 = [(48-15) / 15](100%) = 220%.

d. Using 2013 as the base year, calculate real GDP in 1990 and in 2013. Calculate the percentage change in the real GDP between 1990 and 2013 using 2013 as the base year

Answer:

Since 2013 is used as the base year, real GDP in 2013 is equal to nominal GDP in 1990.

Real GDP in 1990 = $2,000\*500,000 + $20,000\*1,000,000 = $21 billion;

The percentage change in the real GDP between 1990 and 2013 = [(40-21) / 21](100%) = 90.5%.

e. Explain why the base year chosen affects the percentage change in the real GDP between 1990 and 2013.

Answer:

In 1990, computers were expensive relative to automobiles. Consequently, when 1990 is used as the base year, the dramatic increase in the quantity of computers produced between 1990 and 2013 is multiplied by a big price ($6,000), resulting in a large increase in real GDP.

In 2013, however, computers are cheap relative to automobiles. Consequently, when 2013 is used as the base year, the increase in the quantity of computers produced between 1990 and 2013 is multiplied by a relatively low price ($2,000), resulting in a much smaller increase in real GDP.

f. The CPI in a given year is equal to the (cost of a fixed market basket of consumer purchases in that year divided by the cost of that same market basket in a base year)\*(scale factor). Although the cost of the market basket changes over time, the composition of the market basket remains the same. For ease in reporting, the official CPI is equal to this ratio multiplied by 100. Thus, if 1990 is the base year, the reported CPI for 1990 would equal 100. If the fixed market basket is the total amounts of computers and automobiles purchased in 1990, calculate the CPI in 2013, using 1990 as the base year and a 100 point scale.

Answer:

Cost of the basket in 2013 = $2,000\*500,000 + $20,000\*1,000,000 = $21 billion;

Cost of the basket in 1990 = $6,000\*500,000 + $12,000\*1,000,000 = $15 billion;

CPI in 2013 = (21/15)(100) = 140.

g. The GDP deflator for any year is equal to (nominal GDP in that year divided by real GDP)\*(scale factor). Calculate the GDP deflator in 2013, using 1990 as the base year and a 100 point scale.

Answer:

GDP deflator in 2013 = (40/48)(100) = 83.3

h. Calculate the percentage changes in CPI and the GDP deflator between 1990 and 2013. Explain why your answers to the two percentage changes are so different.

Answer:

The percentage change in CPI = (140-100)/100 = 40%

The percentage change in GDP deflator = (83.3-100)/100 = -16.7%

In 1990, computers comprised a small portion of the consumer market basket. Therefore, in the CPI, the dramatic reduction in the price of computers will be outweighed by the increase in the price of automobiles. In GDP deflator, however, the weight given to computers is much greater because they comprise a much larger portion of the GDP in 2013 than in 1990. Consequently, in the index the reduction in computer prices will outweigh the increase in automobile prices.

9. Frictional unemployment is short-term unemployment experienced by people between jobs or by those who are just entering the job market. Structural unemployment results from mismatches—in skills or location—between jobs and workers. What, if anything, could the government do to reduce frictional and structural unemployment?

Answer:

Frictional and structural unemployment might be reduced with government policies. Suggestions for specific policies will vary. Examples include job-training programs to reduce structural unemployment, and programs to improve information flows between employers and job-seekers (e.g., a national job databank). You might also suggest policies designed to increase the cost of being unemployed (e.g., lowering unemployment insurance benefits, shortening the duration of unemployment insurance, or tightening eligibility requirement for receiving welfare payments).

But some amount of unemployment can be a good thing. For example, some frictional unemployment is necessary if workers are to end up in the jobs they are best suited for. And even some structural unemployment is necessary if the economy is to respond to changes in consumer tastes and changes in technology.