Principles of Economics II (Spring 2013)
Homework #3 Answers
(Chapter 25, 26, 28, due on Apr. 24, 2013, submitted in class)

Note: All textbook problem numbers refer to "Problems and Application" part in corresponding chapter, the 6th international student edition of the textbook.

TAs will score even-number problems.

For Chapter 25

1. Textbook, Chapter 25, #5
   a. When a German firm opens a factory in South Carolina, it represents foreign direct investment.

   b. The investment increases U.S. GDP because it increases production in the United States. The effect on U.S. GNP would be smaller because the owners would get paid a return on their investment that would be part of German GNP rather than U.S. GNP.
2. Textbook, Chapter 25, # 6
   a. The United States benefited from the Chinese and Japanese investment because it made our capital stock larger, increasing our economic growth.
   b. It would have been better for the United States to make the investments itself because then it would have received the returns on the investment itself, instead of the returns going to China and Japan.

3. Textbook, Chapter 25, # 10
   a. If output is rising and the number of workers is declining, then output per worker must be rising.
   b. Policymakers should not be concerned as long as output in the manufacturing sector is not declining. The reduction in manufacturing jobs will allow labor resources to move to other industries, increasing total output in the economy. An increase in productivity of workers (as measured by output per worker) is beneficial to the economy.
4. True or False? Other things the same, a country with low income per person can have a higher growth rate than a country with a high income per person even if the countries have identical saving rates. Try to use equations to explain your answers.

正确。考虑生产函数 Y=F(K)，Y 为产出，K 为资本，这里假定其他要素不变（人口单位化为 1）。容易推导得到增长率：

$$\Delta Y/Y=F'(K)\Delta K/Y=F'(K)I/Y=F'(K)*s,$$

这里，I 为投资，s 为储蓄率。由于穷国 K 相对较小（因为 Y 相对较小），根据资本边际报酬递减，则穷国的 F'(K)相对较大，导致其增长率更大。

5. Suppose there are constant returns to scale. Now suppose that over time a country doubles its workers, its natural resources, its physical capital, and its human capital, but its technology is

unchanged. Which of the following would double?

a. both output and productivity

b. output, but not productivity

c. productivity, but not output

d. neither productivity nor output

For Chapter 26

6. Textbook, Chapter 26, #3

To a macroeconomist, saving occurs when a person's income exceeds his consumption, while investment occurs when a person or firm purchases new capital, such as a house or business equipment.

a. When your family takes out a mortgage and buys a new house, that is investment because it is a purchase of new capital.

b. b. When you use your $200 paycheck to buy stock in AT&T, that is saving because your income of $200 is not being spent on consumption goods.

c. When your roommate earns $100 and deposits it in her account at a bank, that is saving because the money is not spent on consumption goods.

d. When you borrow $1,000 from a bank to buy a car to use in your pizza-delivery business, that is investment because the car is a capital good.

7. Textbook, Chapter 26, #5

Private saving is equal to $(Y - C - T) = 10,000 - 6,000 - 1,500 = 2,500$.

Public saving is equal to $(T - G) = 1,500 - 1,700 = -200$.

National saving is equal to $(Y - C - G) = 10,000 - 6,000 - 1,700 = 2,300$.

Investment is equal to saving = 2,300.

The equilibrium interest rate is found by setting investment equal to 2,300 and solving for r:

$3,300 - 100r = 2,300$.

$100r = 1,000$.

$r = 10$ percent.

8. Textbook, Chapter 26, #7

a. Harry will have $\$1,000(1 + 0.05) = \$1,050$. Ron will have $\$1,000(1 + 0.08) = \$1,080$. Hermione will have $\$1,000(1 + 0.20) = \$1,200$.

b. Each student would compare the expected rate of return on his or her own project with the market rate of interest (r). If the expected rate of return is greater than r, the student would borrow. If the expected rate of return is less than r, the student would lend.

c. If $r = 7\%$, Harry would want to lend while Ron and Hermione would want to borrow. The quantity of funds demanded would be $2,000, while the quantity supplied would be $1,000.

If $r = 10\%$, only Hermione would want to borrow. The quantity of funds

demanded would be $1,000, while the quantity supplied would be $2,000.

d. The loanable funds market would be in equilibrium at an interest rate of 8%. Harry would want to lend and Hermione would want to borrow. Ron would use his own savings for his project, but would want to neither borrow nor lend. Thus quantity demanded = quantity supplied = $1,000.

e. Harry will have $1,000(1 + 0.08) = $1,080. Ron will have $1,000(1 + 0.08) = $1,080. Hermione will have $2,000(1 + 0.20) – $1,000(1 + 0.08) = $2,400 – $1,080 = $2,320. Both borrowers and lenders are better off. No one is worse off.

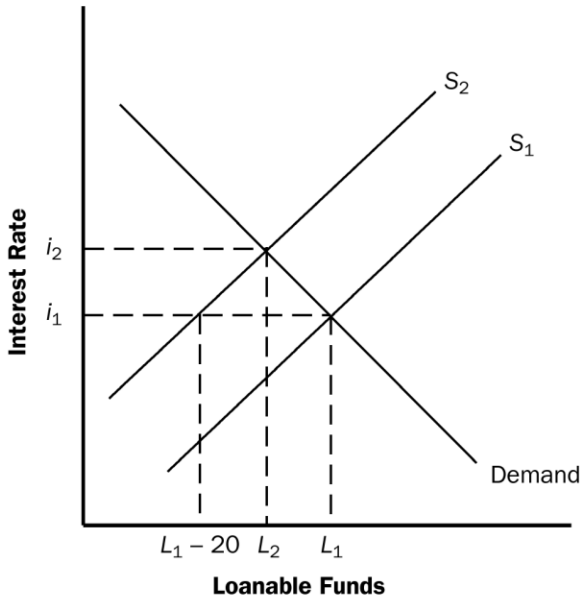


Figure 1

9. Textbook, Chapter 26, #9

a. If new regulations increase the cost of investment, the demand for loanable funds will decline as shown in Figure 4. This will reduce the equilibrium interest rate along with the levels of saving and investment. With a reduction in investment, the economy will face a lower rate of economic growth in the long run.

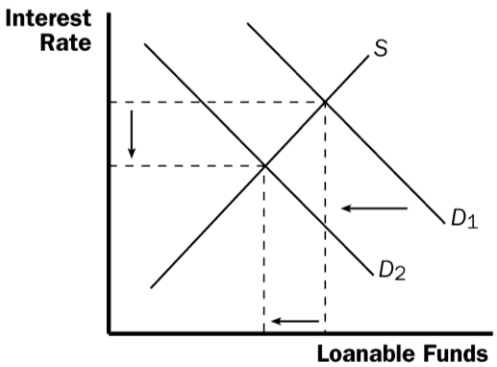


Figure 4

b. If the new regulations improve savers' confidence in the financial system, the supply of loanable funds will increase. The impact can be seen in Figure 5. The interest rate will fall, but saving and investment will rise. Greater investment will increase the rate of economic growth in the long run.

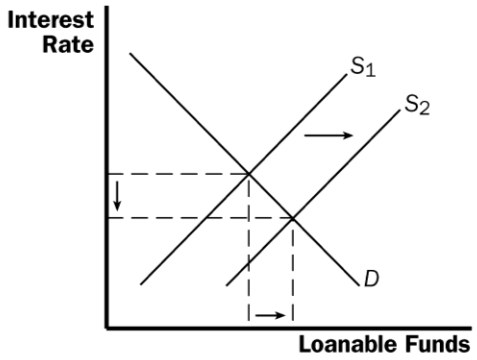


Figure 5

10. According to the definitions of national saving and private saving, if Y, C, and G remained the same, an increase in taxes would
    a. raise national saving and private saving.
    b. raise national saving and reduce private saving.
    c. leave national saving and private saving unchanged.
    d. leave national saving unchanged and reduce private saving.

11. 政府政策与投资 Government policy and investment

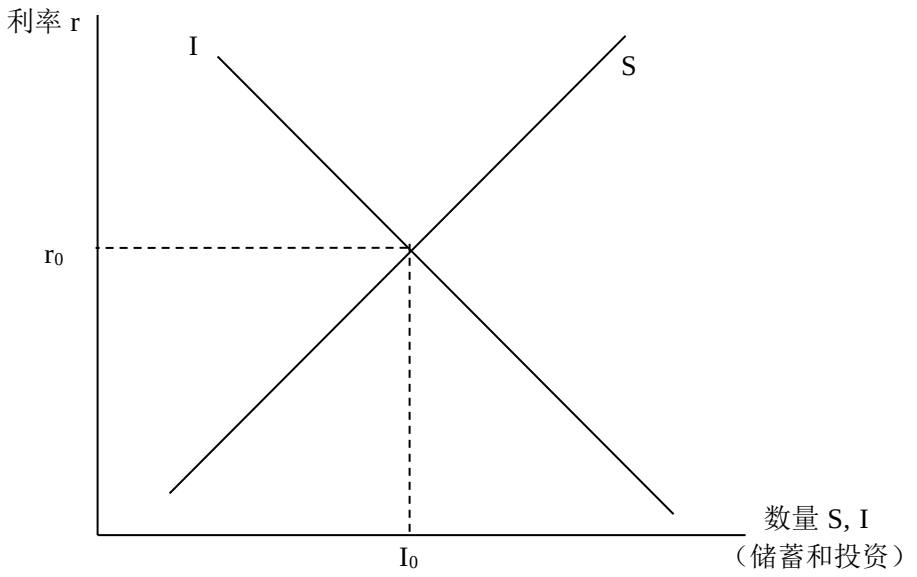
一国政府考虑通过公共政策以鼓励投资。有两种可以选择的方法：一是对私人储蓄减税；二是通过减少政府支出来减少政府预算赤字。

A country considers encouraging its investments through public policies. There are two alternatives: to reduce tax on private saving, or to reduce the government budget deficit by reducing government expenditures.

（1） 画出该国的可贷资金供求曲形，标出均衡的利率和投资数量。

Draw a supply-demand diagram of the country's market for loanable funds. Label the equilibrium interest rate and investment.

如下图。均衡利率为 r_0，均衡投资数量为 I_0。



（2） 分别画图表示对私人储蓄减税和减少预算赤字的影响。各自的利率如何变动？各自的投资数量如何变动？两种政策都能鼓励投资吗？

Draw separate graphs to show the effects on this market of reducing tax on private saving and of reducing the government budget deficit. In each case, how does the interest rate change? How does the investment change? Can each policy encourage investment?

对储蓄减税如下图(a)，减少赤字如下图(b)。（准确来讲，前者是储蓄（供给）曲线下移，含义是在更低的税前利率下，储蓄可以维持不变；后者是储蓄曲线右移，含义是既定利率下储蓄上升。此处不必说明，但以下分析会利用这一点。）

对储蓄减税使得投资者支付的利率下降（图形即表示这一利率），储蓄者得到的利率上升（图形未表示，但可根据均衡储蓄量增加反推）。

减少赤字使得（投资者支付和储蓄者得到的）利率下降。

二者都能鼓励投资（图形中均表示为 I_0 至 I_1 的增加）。

（3） 虽然图形上不易看出，但你能说出两种政策是否都鼓励了私人储蓄吗？解释你的理由。

Although it's not easy to see in the graphs, can you tell how the private saving changes in each case? Explain.

对储蓄减税增加了私人储蓄，因为储蓄者得到的利率上升。

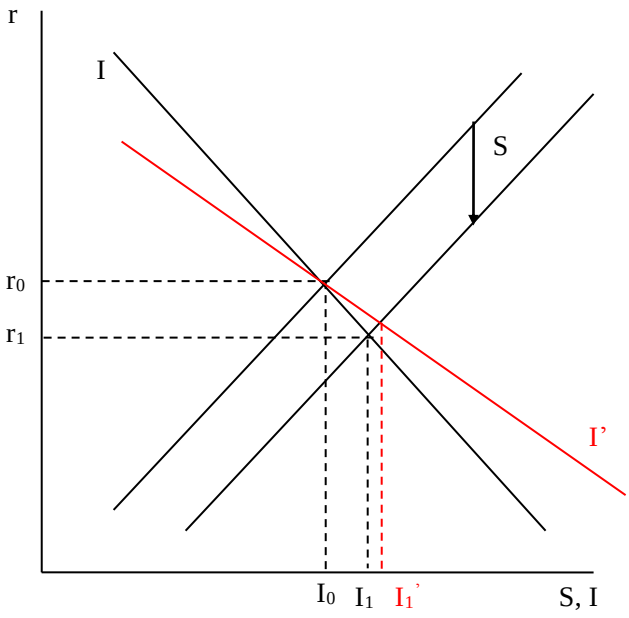
减少赤字减少了私人储蓄，因为利率下降。

（4） 如果投资对利率的弹性比预想的更大，上述两种政策各自对于投资的影响是更大还是更小？用图形明确表示你的答案。

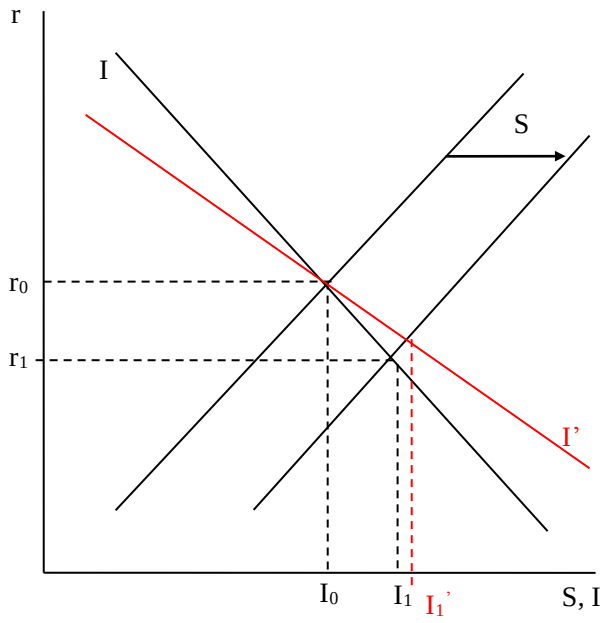
If the interest rate elasticity of investment is larger than expected, will the effect of each policy on investment be larger or smaller? Show your answers clearly by graphs.

如图。两种政策对于投资的影响都变大。（图中用 I'表示弹性更大的投资曲线，I_1'表示投资利率弹性更大时的投资数量）。

（注：要求画出弹性变动后曲线准确的变动——绕原始均衡点旋转）



(a) 对储蓄减税



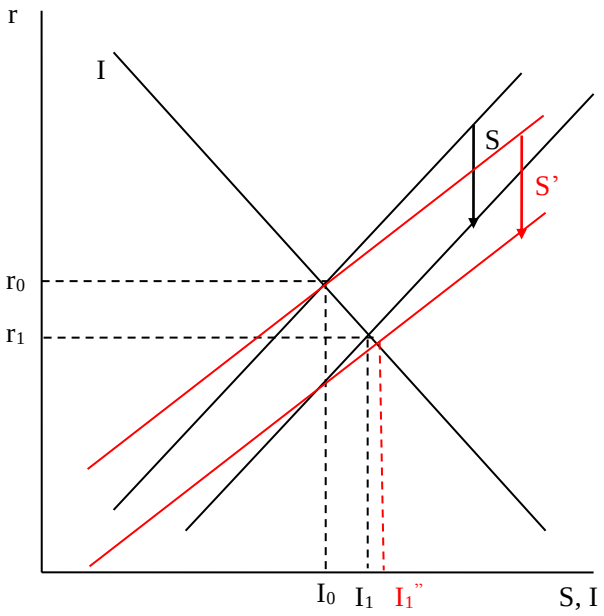
(b) 减少赤字

（5） 如果私人储蓄对利率的弹性比预想的更大，上述两种政策各自对于投资的影响是更大还是更小？画出图形以明确表示你的答案。

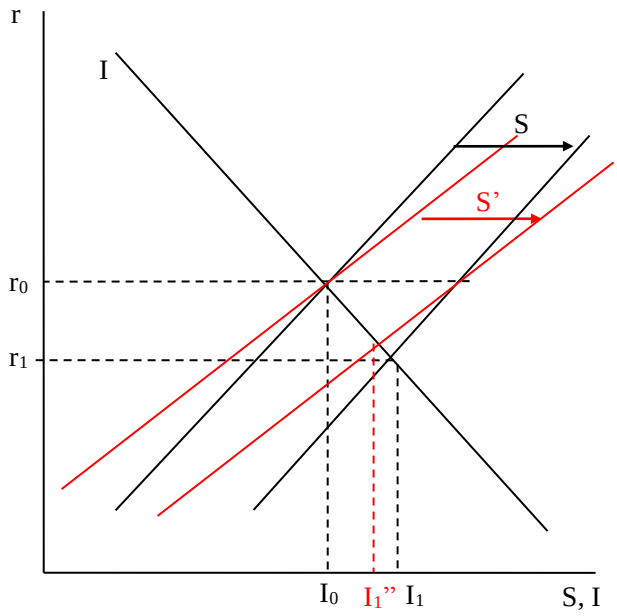
If the interest rate elasticity of private saving is larger than expected, will the effect of each policy on investment be larger or smaller? Show your answers clearly by graphs.

如下图。其中，对储蓄减税政策对于投资的影响更大，但减少赤字政策对于投资的影响更小（图中分别用 S'表示弹性更大时政策影响，I_1"表示弹性更大时均衡投资量）。

（注：对储蓄减税是储蓄曲线向下移动固定距离，无论储蓄曲线弹性如何；而减少赤字是储蓄曲线向右移动固定距离。）



(a) 对储蓄减税



(b) 减少赤字

（6） 政府同时实施这两项政策是困难的。为什么？

Why is it difficult to implement both of these policies at the same time?

困难来自这两项政策面临权衡取舍。当对储蓄减税时，赤字倾向于上升。

（7） 给定这一困难，当投资对利率弹性较大时，你倾向于推荐哪一项政策，还是不能判断？当私人储蓄利率弹性较大时，你倾向于推荐哪一项政策，还是不能判断？说出你的理由。

Given this difficulty, when the interest rate elasticity of investment becomes larger, which policy do you tend to rely on? Or cannot judge? When the interest rate elasticity of private saving becomes larger, which policy do you tend to rely on? Or cannot judge? Explain your answers.

当投资利率弹性较大时，两项政策对于鼓励储蓄的作用是相同的。因此无从判断。（也可以答：对储蓄减税更好，因为此时均衡的投资和储蓄量增加较多，从而对储蓄减税导致的税收收入减少可能较小）。

但私人储蓄对利率弹性较大时，倾向于使用对储蓄减税的政策，因为此时鼓励投资的效果更加明显。

For Chapter 28

12. Textbook, Chapter 28, #1

The labor force consists of the number of employed (139,445,000) plus the number of unemployed (15,260,000), which equals 154,705,000.

To find the labor-force participation rate, we need to know the size of the adult population. Adding the labor force (154,705,000) to the number of people not in the labor force (82,614,000) gives the adult population of 237,319,000. The labor-force participation rate is the labor force (154,705,000) divided by the adult population (237,319,000) times 100%, which equals 65.2%.

The unemployment rate is the number of unemployed (15,260,000) divided by the labor force (154,705,000) times 100%, which equals 9.9%.

13. Textbook, Chapter 28, #4

4. a. If an auto company goes bankrupt and its workers immediate begin looking for work, the unemployment rate will rise and the employment-population ratio will fall.

b. If some of the unemployed auto workers give up looking for a job, the unemployment rate will fall and the employment-population ratio will remain the same.

c. If numerous students graduate from college and cannot find work, the unemployment rate will rise and the employment-population ratio will remain unchanged.

d. If numerous students graduate from college and immediately begin new jobs, the unemployment rate will fall and the employment-population ratio will rise.

e. If a stock market boom induces earlier retirement, the unemployment rate will rise and the employment-population ratio will fall.

f. Advances in health care that prolong the life of retirees will not affect the unemployment rate and will lower the employment-population ratio.

14. Textbook, Chapter 28, #8

8. a. Wages between the two industries would be equal. If not, new workers would choose the industry with the higher wage, pushing the wage in that industry down.

b. If the country begins importing autos, the demand for domestic auto workers will fall. If the country begins to export aircraft, there would be an increase in the demand for workers in the aircraft industry.

c. In the short run, wages in the auto industry will fall, while wages in the aircraft industry will rise. Over time, new workers will move into the aircraft industry bringing its wage down until wages are equal across the two industries.

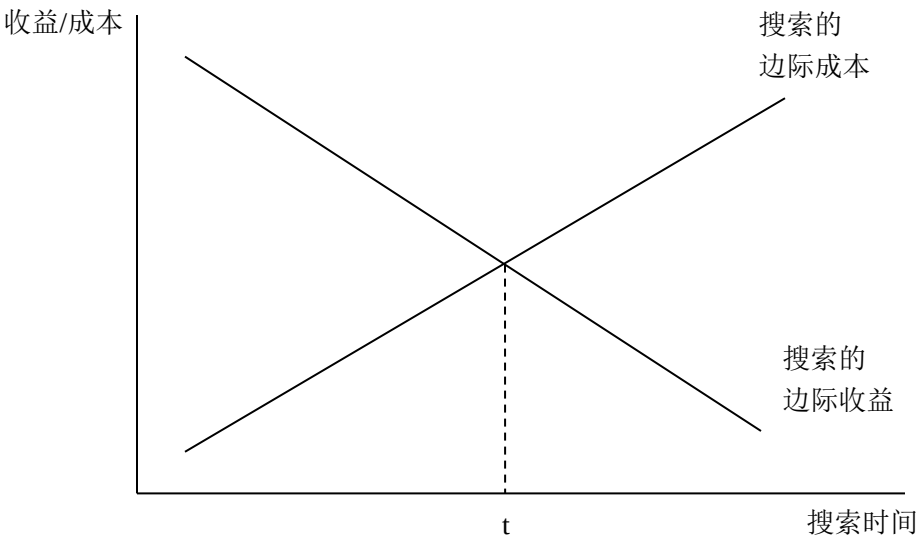
d. If the wage does not adjust to its equilibrium level, there would be a shortage of workers in the aircraft industry and a surplus of labor (unemployment) in the auto industry.

15. 搜索与婚姻

假定一个社会中的婚姻都是适龄人口中无配偶的男士寻找无配偶的女士而达成的。每一位适龄无配偶男士从达到婚配年龄且无配偶的第 1 天起就开始搜寻，该搜寻时间长度的总成本及其边际成本是递增的。随着搜索时间的延长，找到更加合意的配偶的可能性也增加，也就是说，来自搜索时间的收益也是增加的；但搜索时间的边际收益是递减的。

（1） 以搜索时间为横轴，以收益和成本为纵轴，画出搜索时间的边际收益和成本曲线，标出男方选择的最优的搜索时间，记为 t。单位为月。（1 分）

如图。



（2） 假定该社会中每一位适龄无配偶男士搜索时间都是第（1）问求出的时间 t（月），则给定一个适龄无配偶男士的群体，每个月在这中间有多大比例的男士将找到配偶？以符号 f 表示，称之为结婚率。（1 分）

每个月找到配偶的比例为 f=1/t。

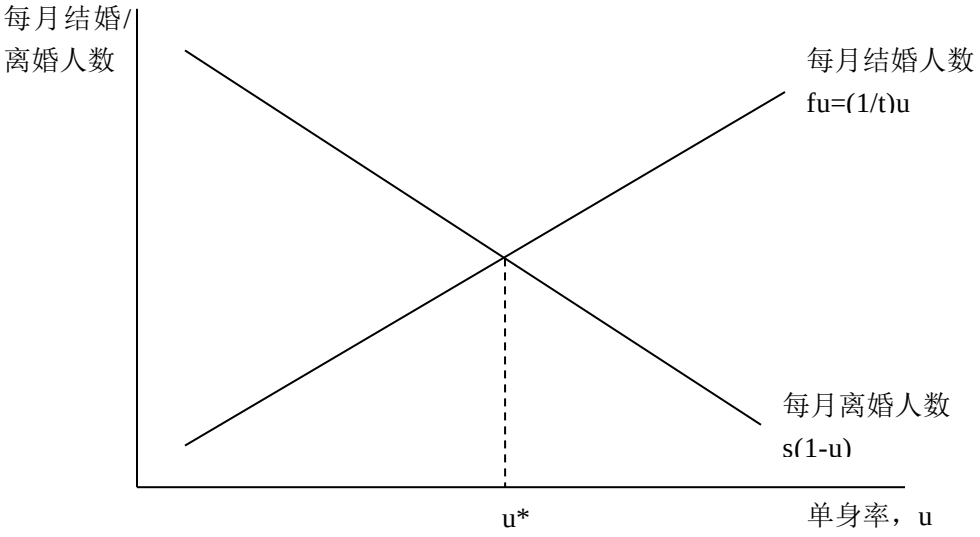
现在假定社会中适龄男士和女士的人口相等，均单位化为 1。以符号 e 表示其中处于婚姻状态（即已婚）的男（女）士人数（或比率），以符号 u 表示处于单身状态（包括从未结婚和离异）的男（女）士人数（或比率）。所有适龄的男士和女士必然处于其中一种状态，即 1=e+u。进一步，假定这个社会每月的离婚率（即每个月当中在处于婚姻状态的男（女）人数中选择离婚的比率）为 s。

（3） 这个社会每月离婚的人数是多少？每月结婚的人数是多少？以符号 f, s, u 加以表示。以单身率 u 为横坐标，以每月的结婚和离婚人数为纵坐标。分别画出两条曲线表示该经济的结婚人数、离婚人数与单身率的关系（假定其他条件不变）。（2 分）

该社会每月离婚人数为：s(1-u)。

该社会每月结婚人数为：fu。

图形如下。



（4） 这个社会处于稳定状态——即单身人数或单身率既不上升也不下降——的单身人数（或单身率）——是多少？（1 分）

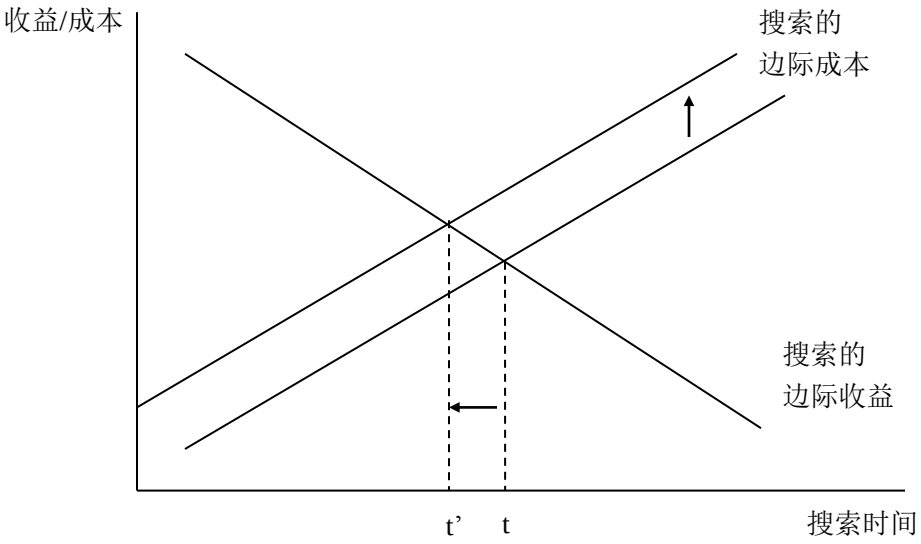
稳态的单身率要求每月结婚和离婚人数相等（对应图形中交点）。

由：s(1-u)=fu，可求得：u*=s/(s+f)。

假定政府出台一项旨在针对已婚男女的福利制度，例如，向已婚男女发放住房补贴。

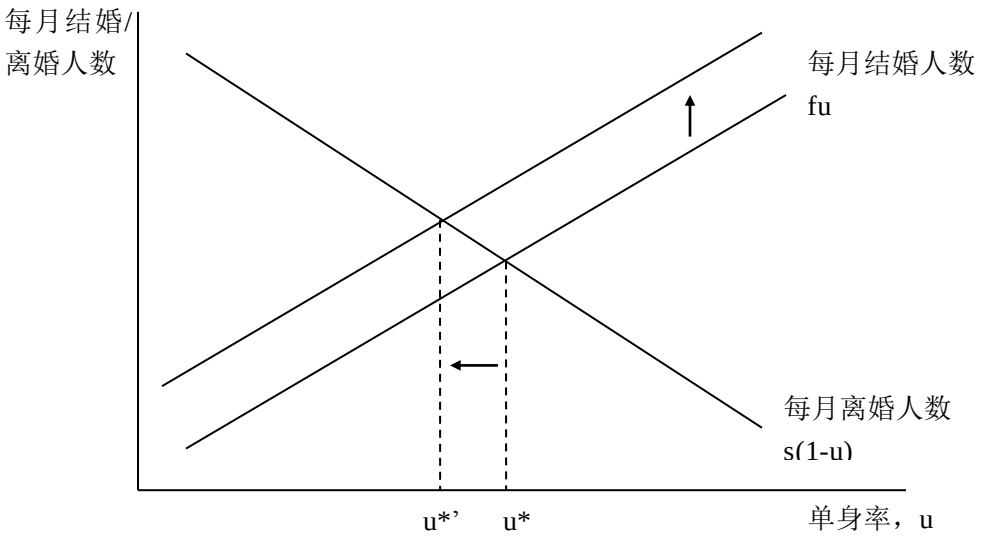
（5） 该政策将如何影响结婚率 f？在类似第（1）问的图形中表示。（1 分）

这将增加保持单身继续搜索的机会成本（在保持单身期间无法享受住房补贴），这将上移搜索的边际成本曲线，导致搜索时间 t 变短，进而增加结婚率 f=1/t。



（6） （紧接第（5）问）该政策将如何影响单身率？如何影响每月结婚和离婚人数？在类似于第（3）问的图形中表示。（1 分）

政策将上移每月结婚人数曲线，最终导致单身率下降。每月结婚和离婚人数增加。



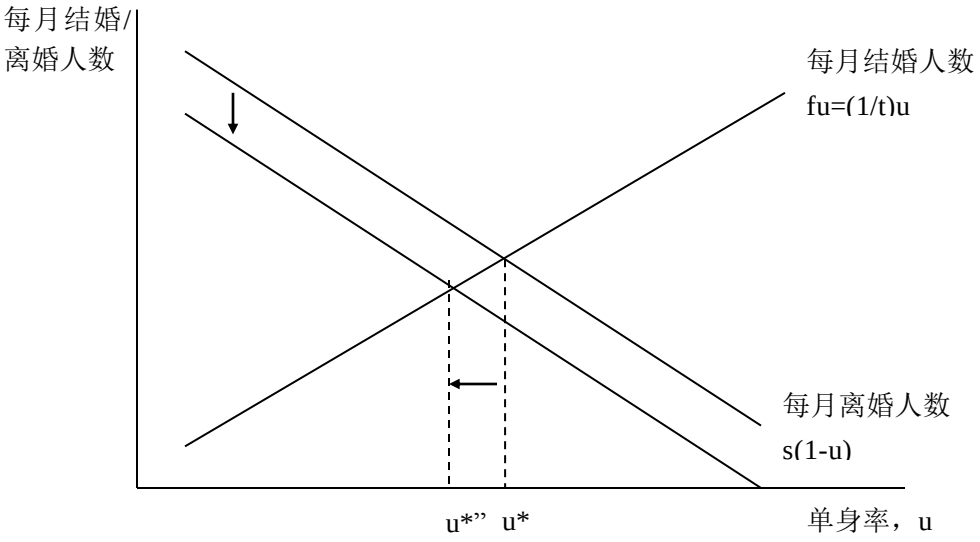
（7） 该政策对婚姻质量将有怎样的影响？解释你的回答。（1 分）

将导致婚姻质量下降，因为搜索时间减少导致寻找到的配偶更不合意。

现在假定政府修改《婚姻法》增加了离婚的诉讼成本。

（8） 上述政策将如何影响离婚率？如何影响单身率？如何影响每月结婚和离婚人数？用图形分析。（1 分）

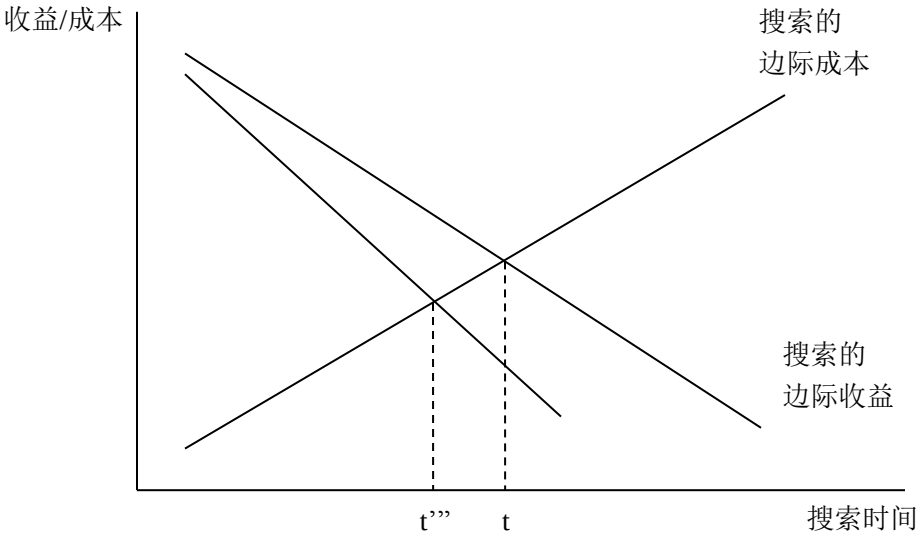
该政策将减少离婚率，导致每月离婚人数曲线下移（如图）。这又导致单身率下降，每月结婚和离婚人数下降。



现在假定网络与电视的普及缩短了单身人群的搜索时间。

（9） 你认为在类似于第（1）问的搜索时间图形中怎样来表示这一影响更为合理？作图表示并用文字解释。（1 分）

表示为边际收益曲线下移也许比较合理，此时，由于在较短时间内就能搜索得到合意的配偶，使得进一步增加搜索时间的边际收益下降了。如图所示。



（10） 这一网络与电视的普及如何影响单身率？如何影响婚姻质量？解释你的回答。（2分）

这将减低单身率（图形类似于第（6）问）。

这将提高婚姻质量，因为搜索的技术进步了。

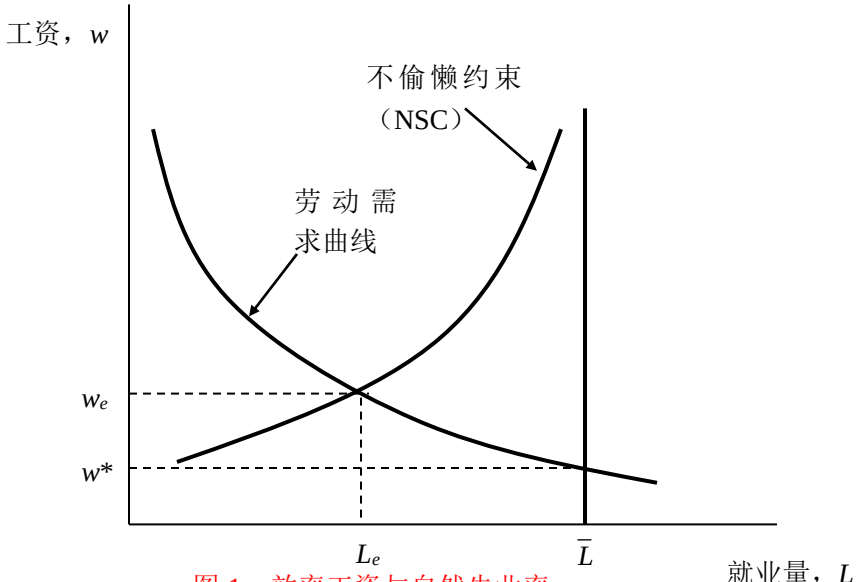


图 1：效率工资与自然失业率