Principles of Economics (Double Degree, Fall 2022)

Note: All textbook problem numbers refer to "Problems and Application" part in corresponding chapter, the 8th Chinese/U.S. edition of the textbook.

For Chapter 17

1

1. a. If there were many suppliers of diamonds, price would equal marginal cost ($1,000), so the quantity would be 12,000.

   b. With only one supplier of diamonds, quantity would be set where marginal cost equals marginal revenue. The following table derives marginal revenue:

Price	Quantity	Total Revenue	Marginal Revenue
$8,000	5,000	$40,000,000	----
7,000	6,000	42,000,000	2,000,000
6,000	7,000	42,000,000	0
5,000	8,000	40,000,000	–2,000,000
4,000	9,000	36,000,000	–4,000,000
3,000	10,000	30,000,000	–6,000,000
2,000	11,000	22,000,000	–8,000,000
1,000	12,000	12,000,000	–10,000,000

With marginal cost of $1,000 per diamond, or $1 million per thousand diamonds, the monopoly will maximize profits at a price of $7,000 and a quantity of 6,000. Additional production beyond this point would lead to a situation where marginal revenue is lower than marginal cost.

c. If Russia and South Africa formed a cartel, they would set price and quantity like a monopolist, so the price would be $7,000 and the quantity would be 6,000. If they split the market evenly, they would share total revenue of $42 million and costs of $6 million, for a total profit of $36 million. So each would produce 3,000 diamonds and get a profit of $18 million. If Russia produced 3,000 diamonds and South Africa produced 4,000, the price would decline to $6,000. South Africa's revenue would rise to $24 million, costs would be $4 million, so profits would be $20 million, which is an increase of $2 million.

d. Cartel agreements are often not successful because each party has a strong incentive to cheat to make more profit. In this case, each could increase profit by $2 million by producing an extra 1,000 diamonds. However, if both countries did this, profits would decline for both of them.

2

6. a. The payoffs are:

		Your Decision	
		Work	Shirk
Classmate's Decision	Work	You get 15 units of happiness Classmate gets 15 units of happiness	You get 30 units of happiness Classmate gets 5 units of happiness
	Shirk	You get 5 units of happiness Classmate gets 30 units of happiness	You get 10 units of happiness Classmate gets 10 units of happiness

b. The likely outcome is that both of you will shirk. If your classmate works, you're better off shirking, because you would rather have 30 units of happiness than 15. If your classmate shirks, you are better off shirking because you would rather have 10 units of happiness than 5. Your dominant strategy is to shirk. Your classmate faces the same payoffs, so she will also shirk.

c. If you are likely to work with the same person again, you have a greater incentive to work, so that your classmate will work, and you will both be better off. In repeated games, cooperation is more likely.

d. The payoff matrix would become:

		Your Decision	
		Work	Shirk
Classmate's Decision	Work	You get 15 units of happiness Classmate gets 55 units of happiness	You get 30 units of happiness Classmate gets 25 units of happiness
	Shirk	You get 5 units of happiness Classmate gets 50 units of happiness	You get 10 units of happiness Classmate gets 10 units of happiness

Work is a dominant strategy for this new classmate. Therefore, the Nash

equilibrium will be for you to shirk and your classmate to work. You would get a B and thus would prefer this classmate to the first. However, she would prefer someone with a dominant strategy of working as well so that she could get an A.

3

8. a. The playoff matrix for this game is:

		Player One's Decision	
		Take Drug	Don't Take Drug
Player Two's Decision	Take Drug	Player 1 gets $5{,}000 - X$ Player 2 gets $5{,}000 - X$	Player 1 gets 0 Player 2 gets $10{,}000 - X$
	Don't Take Drug	Player 1 gets $10{,}000 - X$ Player 2 gets 0	Player 1 gets 5,000 Player 1 gets 5,000

b. Taking the drug will be a dominant strategy for each player as long as X is less than 5,000.

c. Making the drug safer (lowering X) raises the likelihood of taking the drug because it increases the payoff.

4

9. a. If Kona enters, Big Brew would want to maintain a high price. If Kona does not enter, Big Brew would want to maintain a high price. Thus, Big Brew has a dominant strategy of maintaining a high price.

If Big Brew maintains a high price, Kona would enter. If Big Brew maintains a low price, Kona would not enter. Kona does not have a dominant strategy.

b. Because Big Brew has a dominant strategy of maintaining a high price, Kona should enter. This is the only Nash equilibrium.

c. Little Kona should not believe this threat from Big Brew because it is not in Big Brew's interest to carry out the threat. If Little Kona enters, Big Brew can set a high price, in which case it makes $3 million, or Big Brew can set a low price, in which case it makes $1 million. Thus, the threat is an empty one, which Little Kona should ignore; Little Kona should enter the market.

d. If the two firms could successfully collude, they would agree that Big Brew would maintain a high price and Kona would remain out of the market. They could then split a profit of $7 million.

15.D

For Chapter 18

1. Textbook, Chapter 18, #5

5. a. The firm's demand for labor is the same as its value of the marginal product. The firm will set wage equal to *VMP*:

$w = VMP = P \times MP_L = 2(100 - 2L) = 200 - 4L$

The market demand curve for labor will be the horizontal summation of the 20 firm demand curves (summed across L).

Rearranging the firm's demand, we get $L = 50 - 0.25w$. Thus, the market demand curve must be $L = 20(50 - 0.25w) = 1{,}000 - 5w$.

b. If labor supply is inelastic at 200, then we can solve for wage by determining the market equilibrium:

$200 = 1{,}000 - 5w$
$w = 160$.

Each firm will hire 10 workers (200 workers/20 orchards) and produce $Q = 100(10) - (10)^2 = 900$ apples. Total revenue for each firm will be (2)(900) = 1,800. Assuming that wages are the firm's only costs, total costs will be (160)(10) = 1,600, leaving each firm with profit = 200. Total income for the country will be (200)(160) + (20)(200) = 36,000.

c. If the world price of apples rises to $4, the value of the marginal product (and thus each firm's demand for labor) rises.

$w = VMP = P \times MP_L = 4(100 - 2L) = 400 - 8L$

Rearranging for L, we get $L = 50 - 0.125w$. Thus, the market demand for labor becomes:

$L = 20(50 - 0.125w) = 1{,}000 - 2.5w$. Finding the new equilibrium wage, we get:

$200 = 1{,}000 - 2.5w$
$w = 320$

Each firm will still hire 10 workers and produce 900 apples. Thus total revenue will be (4)(900) = 3,600. Total cost will be (320)(10) = 3,200. Profit will be 400.

Total income will be (320)(200) + (400)(20) = 72,000.

d. Now there are 10 orchards, so the market demand is 10 times the individual firm demand curves:

$L = 10(50 - 0.25w) = 500 - 2.5w$. Solving for the equilibrium wage, we get:
$200 = 500 - 2.5w$
$w = 120$

Each firm will now hire 20 workers and produce $Q = 100(20) - (20)^2 = 1{,}600$.

Total revenue = (2)(1,600) = 3,200

Total cost = (120)(20) = 2,400. So profit = 800.

Total income in the country equals (120)(200) + (800)(10) = 32,000. Thus, income has fallen in the country.

2. Textbook, Chapter 18, #7

7. a. Leadbelly should hire workers up to the point where *VMP* is equal to the wage of $150 per day.

b. Since *VMP* is equal to $150 at the profit-maximizing level of output, and *VMP* = *MP* × *P*, the price of pencils must be $5 per box.

c. As Figure 8 shows, the market wage is determined in the labor market ($150 per day). The firm takes this wage as given and chooses its level of labor where *VMP* is equal to $150 per day.

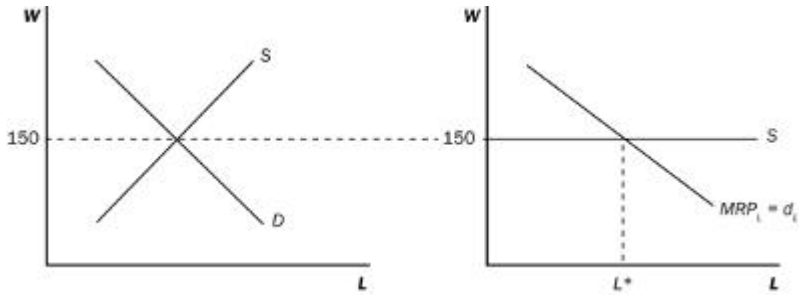


Figure 8

d. The decrease in the supply of labor will raise the equilibrium wage (see Figure 9). The increase in wage will reduce the profit-maximizing level of labor hired

in both the pencil market and by Leadbelly. The value of the marginal product of workers will rise to the level of the new wage. Because the price of pencils has not changed and the value of the marginal product increases, the marginal product of labor must increase. This change in the marginal product of labor is consistent with diminishing marginal product and a lower level of labor.

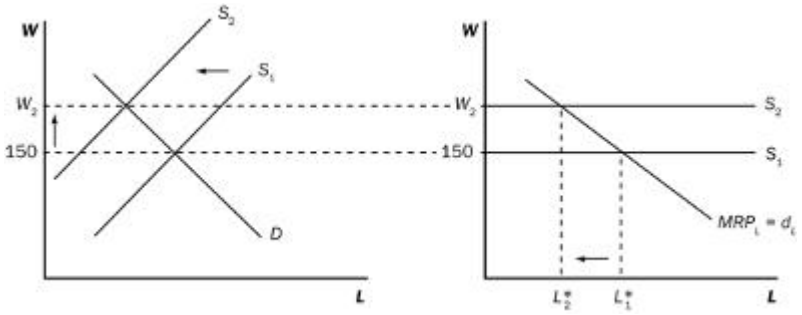


Figure 9

3. Textbook, Chapter 18, #8

8. a. If a firm already gives workers fringe benefits valued at more than $3, the new law would have no effect. But a firm that currently has fringe benefits less than $3 would be affected by the law. Imagine a firm that currently pays no fringe benefits at all. The requirement that it pay fringe benefits of $3 reduces the value of the marginal product of labor effectively by $3 in terms of the cash wage the firm is willing to pay. This is shown in Figure 10 as a leftward shift in the firm's demand for labor from D_1 to D_2, a shift of exactly $3.

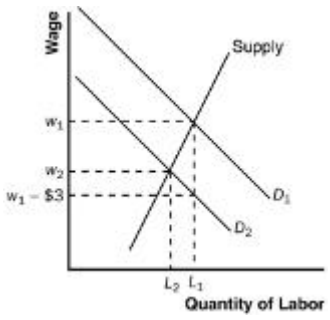


Figure 10

b. Because the supply curve has a positive but finite slope, the new equilibrium will be one in which the new wage, w_2, is less than the old wage, w_1, but $w_2 > w_1 - \$3$. The quantity of labor also declines.

c. The preceding analysis is incomplete, of course, because it ignores the fact that the fringe benefits are valuable to workers. As a result, the supply curve of

labor might increase, shown as a shift to the right in the supply of labor in Figure 11. In general, workers would prefer cash to specific benefits, so the mandated fringe benefits are not worth as much as cash would be. But in the case of fringe benefits there are two offsetting advantages: (1) fringe benefits are not taxed; and (2) firms offer cheaper provision of health care than workers could purchase on their own. Thus, whether the fringe benefits are worth more or less than $3 depends on which of these effects dominates.

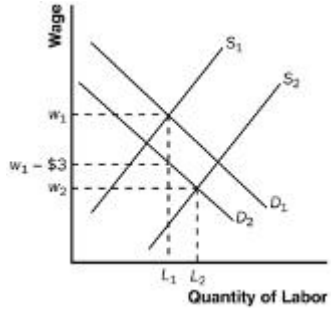


Figure 11

Figure 11 is drawn under the assumption that the fringe benefits are worth more than $3 to the workers. In this case, the new wage, w_2, is less than w_1 – $3 and the quantity of labor increases from L_1 to L_2.

If the shift in the supply curve were the same as the shift in the demand curve, then $w_2 = w_1 - \$3$ and the quantity of labor remains unchanged.

If the shift in the supply curve were less than the shift in the demand curve, then $w_2 > w_1 - \$3$ and the quantity of labor decreases.

In all three cases, there is a lower wage and higher quantity of labor than if the supply curve were unchanged.

d. Because a minimum-wage law would not allow the wage to decline when greater fringe benefits are mandated, it would lead to increased unemployment, because firms would refuse to pay workers more than the value of their marginal product.

4. Textbook, Chapter 18, #9

9. a. Substituting the values given, output

and the dollar value of the output, PY, is $60,000.

b. The wage is equal to the value of the marginal product, which is equal to the marginal product of labor multiplied by the price:

and the real wage *W/P* is \$40/\$2 = \$20.

c. The labor share *(WL)/(PY)* is .

d. i. When inflation increases P from 2 to 3, output *Y* remains constant at 30,000, wage *W* increases from \$40 to \$60, the real wage *W/P* remains constant at \$20, and the labor share *(WL)/(PY)* remains constant at 2/3.

ii. When technological progress increases from 3 to 9, output *Y* increases from 30,000 to 90,000, wage *W* increases from \$40 to \$120, the real wage *W/P* increases from \$20 to \$60, and the labor share *(WL)/(PY)* remains constant at 2/3.

iii. When capital accumulation increases from 1,000,000 to 8,000,000, output *Y* increases from 30,000 to 60,000, wage *W* increases from \$40 to \$80, the real wage *W/P* increases from \$20 to \$40, and the labor share *(WL)/(PY)* remains constant at 2/3.

iv. When a plague decreases L from 1,000 to 125, output *Y* decreases from 30,000 to 7,500, wage *W* increases from \$40 to \$80, the real wage *W/P* increases from \$20 to \$40, and the labor share *(WL)/(PY)* remains constant at 2/3.

e. The observation that the labor share is relatively stable over time in spite of changes in the U.S. economy is consistent with this Cobb-Douglas production function. With all of the changes, the labor share remained constant at 2/3.

5.

技术进步与劳动市场

某城市有许多家相同的快递公司，他们雇佣的送快递工每人每天可以送 10 份快件。该城市每天需要送快递的潜在顾客数量为 10 万人（份），每个顾客愿意为每份快件支付 10 元。送快递工处于一个竞争的劳动市场上。

（1） 画出送快递工市场的劳动需求曲线。

（2） 画出送快递工市场的劳动供给曲线。送快递工的均衡工资是多少？均衡的送快递数量是多少？是否可能有多种结果？如果是，分别在图形中加以表示。解释你的结论。

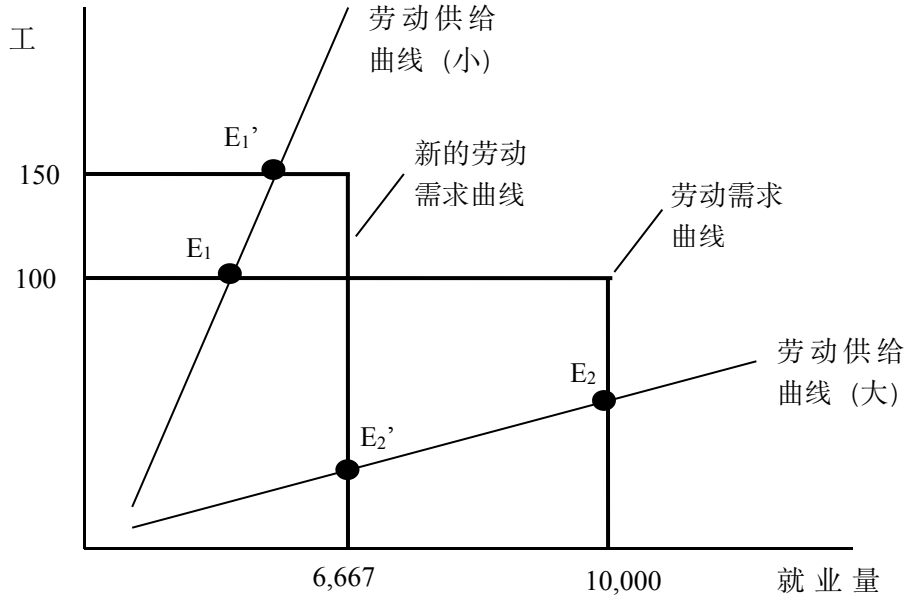
(3) 现在，技术进步使得每个送快递工每天可以送 15 份而非 10 份快件。重新画出劳动需求曲线。送快递工的均衡工资是上升，下降，还是都有可能？此时，均衡的送快递数量是上升，下降，还是都有可能？利用图形解释你的结论。

(4) 假定技术进步不仅使得每个送快递工每天可以送 15 份而非 10 份快件；而且经济增长使得潜在的顾客数量从 10 万人（份）增加到 15 万人（份）。此时，送快递工的均衡工资是上升，下降，还是都有可能？均衡的送快递数量是上升，下降，还是都有可能？利用图形解释你的结论。

某城市有许多家相同的快递公司，他们雇佣的送快递工每人每天可以送 10 份快件。该城市每天需要送快递的潜在顾客数量为 10 万人，每个顾客愿意为每份快件支付 10 元。送快递工处于一个竞争的劳动市场上。

(1) 画出送快递工市场的劳动需求曲线。

如图。



(2) 画出送快递工市场的劳动供给曲线。送快递工的均衡工资是多少？均衡的送快递数量是多少？是否可能有多种结果？如果是，分别在图形中加以表示。解释你的结论。

如上图。可能有多种结果。如果劳动供给比较小，均衡工资为 100 元（图中点 E_1）；此时均衡的送快递数量小于（最多等于）潜在顾客数量 10 万。

如果劳动供给比较大，均衡工资小于（最多等于）100 元（图中点 E_2）；此时均衡的送快递数量等于潜在顾客数量 10 万。

(3) 现在，技术进步使得每个送快递工每天可以送 15 份而非 10 份快件。重新画出劳动需求曲线。送快递工的均衡工资是上升，下降，还是都有可能？此时，均衡的送快递数量是上升，下降，还是都有可能？利用图形解释你的结论。

如上图。劳动需求曲线变得更窄但也更高。

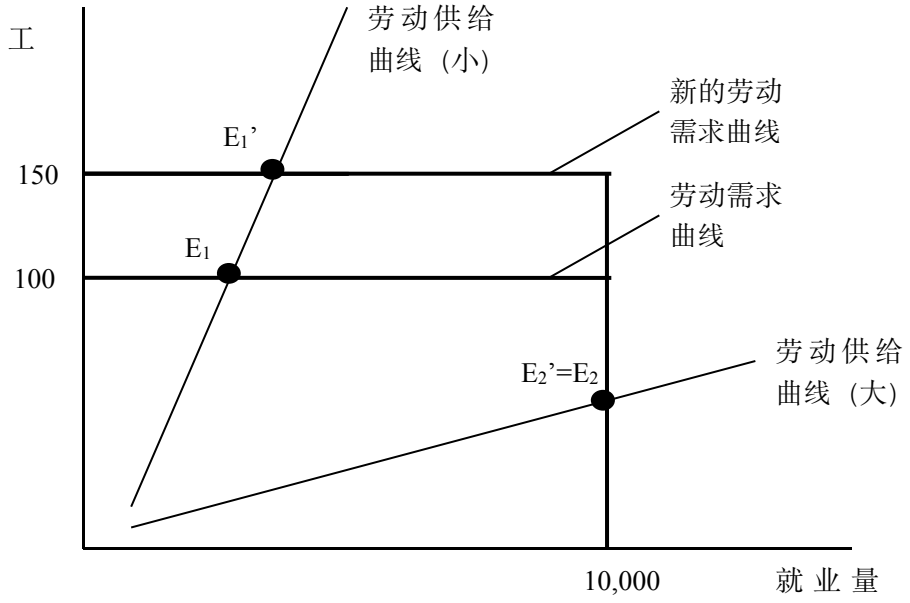
当送快递工的劳动供给较小，使得原来的均衡就业小于 6,667 时，其均衡工资上升，最高可达 150 元（图中 E_1’ 点）。相反，当送快递工的劳动供给较大时，使得原来的均衡就业大于 6,667 时，其均衡工资下降（图中 E_2’点）。

均衡的送快递数量总是上升或不变。当劳动供给较大使得原来的均衡就业大于 6,667 时，送快递数量最终必然等于潜在顾客数量 10 万，只可能是不变（类似图中 E_2，E_2’点）或上升。

相反，当劳动供给较小使得原来的均衡就业小于 6,667 时，根据刚才的分析，此时送快递工的均衡工资上升，这使得均衡就业量上升，而单个工人送快递数量也上升，因此总的送快递数量必然上升（图中 E_1，E_1'点）。

(4) 假定技术进步不仅使得每个送快递工每天可以送 15 份而非 10 份快件；而且经济增长使得潜在的顾客数量从 10 万人增加到 15 万人。此时，送快递工的均衡工资是上升，下降，还是都有可能？均衡的送快递数量是上升，下降，还是都有可能？利用图形解释你的结论。

如下图。劳动需求曲线整体向外移动（部分不移动）。因此工人的均衡工资肯定增加或不变，均衡就业肯定增加或不变（分别对应图中点 E_1，E_1'或点 E_2，E_2'）。均衡的送快递数量肯定增加（不可能不变，因为即使均衡就业不变，单个工人送快递数也增加了）。



For Chapter 19

6. 超级明星现象

杰克和吉尔分别是幸福小镇与和谐小镇的两位歌手。相比较而言，杰克是一位略微优秀一些的歌手，两个小镇的每个居民每个月都愿意花 10 美元听杰克的一场音乐会，而只愿意花 9 美元听吉尔的音乐会。小镇演出场地很小，每一场音乐会只能容纳 100 人，而每个小镇有 1,000 个居民。两位歌手开办一场演唱会的成本为 500 美元。不过，他们每个月最多只能办两场音乐会——再增加场次会极大损害两位歌手的嗓子，带来巨大的成本。

(1) 假定这两个小镇距离遥远，交通不便，因而杰克和吉尔分别成为了两个小镇演唱会的垄断提供者。计算他们各自的月收入（即作为企业的利润）。二者的收入相差多少美元？

(2) 现在假定由于交通设施的改进，两位歌手可以无成本地来往两地，进行巡回演出。这使得杰克和吉尔成为了两个小镇演唱会的竞争提供者。你预计此时他们各自的月收入是多少？二者的收入相差多少？给出你的分析过程。

(3) 现在，技术进入使得两位歌手可以每月灌制一张唱片以满足小镇居民的需求。假定小镇居民对于听唱片和听演唱会的支付意愿是相同的。灌制一张唱片需支付固定成

本为 1,000 美元，复制每张唱片的额外成本为 1 美元，可以复制任意数量。考虑两个歌手分别是各自小镇歌曲市场的垄断提供者的假定。此时，两个歌手会选择继续开演唱会，还是灌制唱片？如果是后者，唱片的价格为多少？他们各自的月收入是多少？收入差距是多少？

(4) 紧接第（3）问。现在考虑两位歌手的唱片均可以在两个小镇销售，忽略运输成本。这使得两位歌手成为了歌曲市场的竞争提供者。此时，两个歌手会选择继续开演唱会，还是灌制唱片？如果是后者，唱片的价格为多少？他们各自的月收入是多少？收入差距是多少？（假定当消费者从不同歌手提供产品中获得相同消费者剩余时，他略微倾向于购买更优质的产品，即杰克的产品。）

(5) 紧接第（4）问。考虑以下条件改变对杰克和吉尔收入差距的影响。(i) 消费者对吉尔的演唱的评价下降到 8 美元。(ii) 两个小镇的居民人数各自上升至 2,000 人。通过计算回答。

(6) 通过以上分析，总结在劳动力市场上产生超级明星的条件。

(1) 假定这两个小镇距离遥远，交通不便，因而杰克和吉尔分别成为了两个小镇演唱会的垄断提供者。计算他们各自的月收入（即作为企业的利润）。二者的收入相差多少美元？

杰克：10*100*2-500*2=1,000。

吉尔：9*100*2-500*2=800。

二者收入相差 200 美元。

(2) 现在假定由于交通设施的改进，两位歌手可以无成本地来往两地，进行巡回演出。这使得杰克和吉尔成为了两个小镇演唱会的竞争提供者。你预计此时他们各自的月收入是多少？二者的收入相差多少？给出你的分析过程。

注意到此时小镇演唱会的需求仍然远大于两位歌手的供给能力。两位歌手都没有降低价格以扩大需求的激励。因此，他们仍然可以收取消费者的支付意愿，即杰克对每位居民收取 10 美元，吉尔收取 9 美元。

二者收入不变，各为 1,000 和 800 美元，收入差距为 200 美元。

(3) 现在，技术进入使得两位歌手可以每月灌制一张唱片以满足小镇居民的需求。假定小镇居民对于听唱片和听演唱会的支付意愿是相同的。灌制一张唱片需支付固定成本为 1,000 美元，复制每张唱片的额外成本为 1 美元，可以复制任意数量。考虑两个歌手分别是各自小镇歌曲市场的垄断提供者的假定。此时，两个歌手会选择继续开演唱会，还是灌制唱片？如果是后者，唱片的价格为多少？他们各自的月收入是多少？收入差距是多少？

先来计算灌制唱片带来的利润。两位歌手仍然可以对唱片收取等于消费者的支付意愿的价格，分别为 10 美元和 9 美元。由于复制唱片的边际成本低于价格，他们会选择复制最大数量——即小镇居民人数。各自的利润为：

杰克：（10-1）*1,000-1,000=8,000。

吉尔：(9-1)*1,000-1,000=7,000。

注意到出售唱片的边际利润（9 美元或 8 美元）均高于开办演唱会的边际利润（5 美元和 4 美元），因此出售唱片对于两个歌手在任何数量下都更合算。因此他们会选择灌制唱片。

此时，二者的收入差距为 1,000 美元。

(4) 紧接第（3）问。现在考虑两位歌手的唱片均可以在两个小镇销售，忽略运输成本。这使得两位歌手成为了歌曲市场的竞争提供者。此时，两个歌手会选择继续开演唱会，还是灌制唱片？如果是后者，唱片的价格为多少？他们各自的月收入是多少？收入差距是多少？（假定当消费者从不同歌手提供产品中获得相同消费者剩余时，

他略微倾向于购买更优质的产品，即杰克的产品。

假定两位歌手选择灌制唱片，且一开始的唱片价格分别为 10 美元和 9 美元，则各自仍然在各自小镇销售。则任何一方略微降低一点价格是有利可图的：他可以吸引对方所有顾客（1000 人），而只付出微小的价格下降的成本。按此逻辑，双方会持续降低价格，只到一方利润为零退出市场。由于杰克具有的"支付意愿优势"，最终退出市场的会是吉尔。假定此时杰克的价格为 P，则吉尔的价格为 P-1，其零利润条件为：

（P-1-1）*2000-1,000=0

解得：P=2.5。

注意到此时唱片价格已低于演唱会的边际成本（5 美元），因此开演唱会必定不合算。双方的均衡是选择灌制唱片，杰克唱片定价 2.5 美元，吉尔 1.5 美元。吉尔退出市场。

杰克利润：(2.5-1)*2,000-1,000=2,000。

吉尔利润：0

收入差距：2,000。

（5） 紧接第（4）问。考虑以下条件改变对杰克和吉尔收入差距的影响。（i）消费者对吉尔的演唱的评价下降到 8 美元。（ii）两个小镇的居民人数各自上升至 2,000 人。通过计算回答。

（i）此时通过类似第（4）问计算，杰克唱片的价格为 3.5 美元，吉尔退出市场（利润为零）。

杰克利润：（3.5-1）*2,000-1,000=4,000。

收入差距为 4,000。

(ii)首先按照类似的逻辑确定此时杰克唱片的定价：（P-1-1）*4000-1000=0

解得：P=2.25

杰克利润：(2.25-1)*4,000-1,000=4,000。

收入差距：4,000。

（6） 通过以上分析，总结在劳动力市场上产生超级明星的条件。

第一个条件：消费者希望享受最优生产者提供的服务。（哪怕差别很细微，也会被市场竞争所放大。）

第二个条件：低成本复制成为可能（否则边际成本递增会限制最优生产者挤出对手和占领市场的竞争能力。）

For Chapter 20

7. Textbook, Chapter 20, #4

4. Community 1 has ten families with income of $100,000 each and ten families with income of $20,000 each. Community 2 has ten families with income of $200,000 each and ten families with income of $22,000 each.

   a. Community 2 has more unequal income than Community 1. In Community 2 the rich have nearly ten times the income of the poor, while in Community 1 the rich have only five times the income of the poor. However, the problem of poverty is likely to be slightly worse in Community 1, since the poor have lower income and the rich are likely to pay less in taxes than the rich in Community 2.

b. Rawls would prefer the distribution of income in Community 2, since the worst-off family has more income than in Community 1.

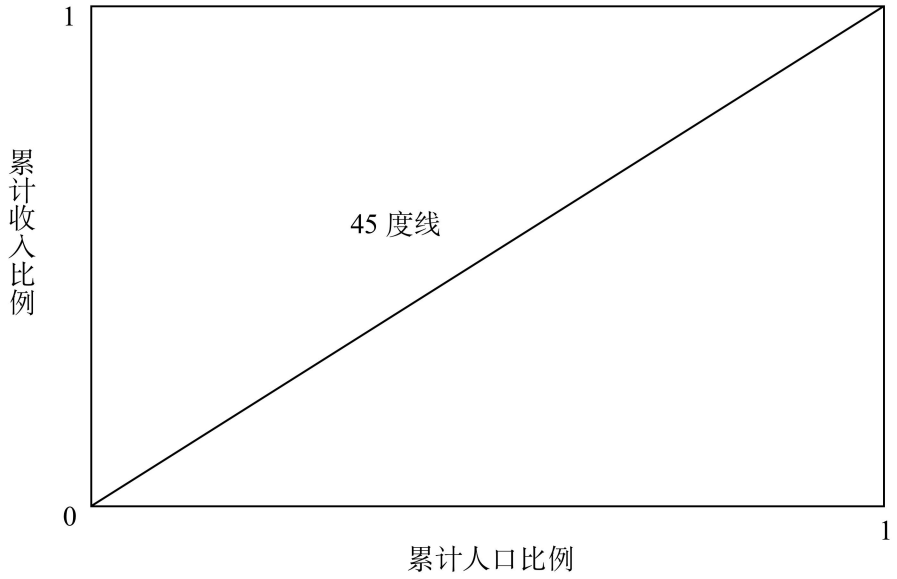
c. Most people will prefer the income distribution of Community 2, since both rich and poor families are better off than their counterparts in Community 1, even though inequality is greater.

d. A utilitarian may prefer the income distribution of Community 1 because income is more equal across its citizens.

8. 收入不平等

一个经济当中有三类人：低收入者、中等收入者和高收入者。每一类人内部收入没有差别。

(1) 在下图中画出由这三类人组成经济的洛仑兹曲线（即累计人口比例和累积收入比例的关系曲线）。如何根据图形计算衡量收入不平等的基尼系数？简单加以说明。



(2) 假定低收入者的收入提高了，但仍然低于中等收入者。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

(3) 假定高收入者的收入提高，其他两个收入阶层收入没有变化。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

(4) 假定中等收入者收入提高，其他两个收入阶层收入没有变化。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

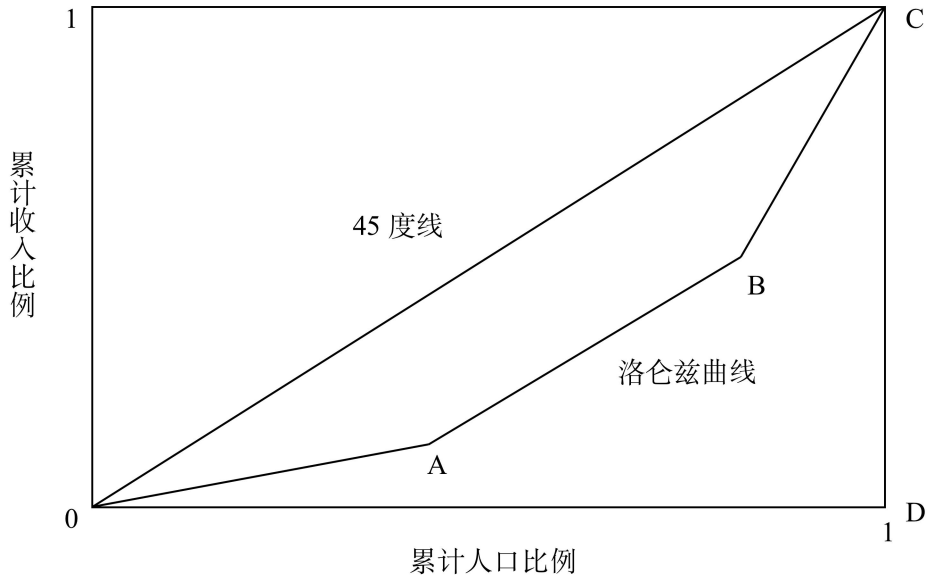
(5) 假定部分但非全部低收入者收入上升，成为了中等收入者。洛仑兹曲线将会如何

变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

(6) 政府对每个高收入者征收相同数量的税收，并转移给每个低收入者相同的收入。但高收入者收入仍然高于中、低收入者。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

(1) 在下图中画出由这三类人组成经济的洛仑兹曲线（即累计人口比例和累积收入比例的关系曲线）。如何根据图形计算衡量收入不平等的基尼系数？简单加以说明。

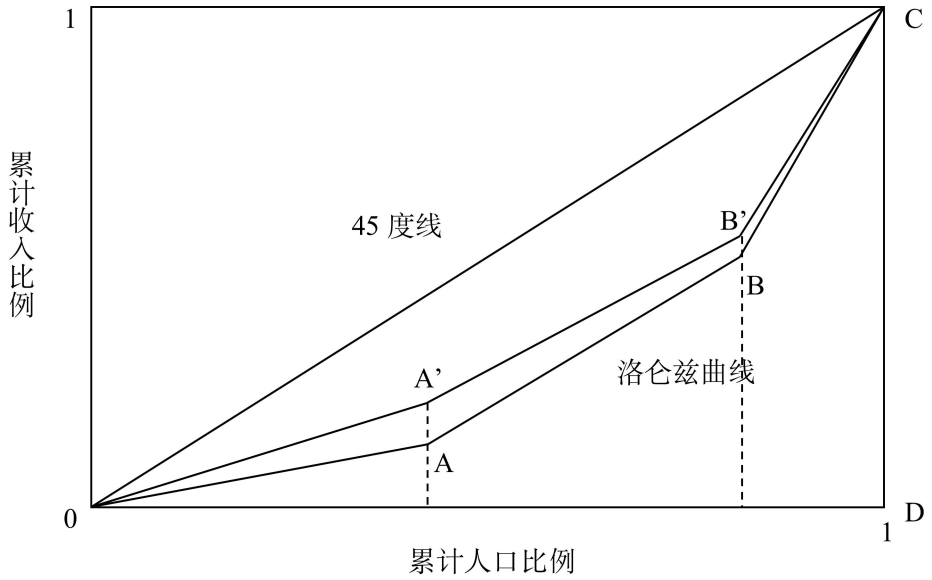
洛仑兹曲线如下图 OABC。基尼系数就是洛仑兹曲线与 45 度线所围面积（OABC）与等腰直角（边长为 1）三角形（ODC）的面积之比。



(2) 假定低收入者的收入提高了，但仍然低于中等收入者。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

如下图。洛仑兹曲线上移至 OA’B’C。（理由：低收入者所占收入比例上升，因而 A 点上移至 A’点。高收入者所占收入比例下降，因而 B 点上移至 B’点；但三类人的排序不改变。）收入不平等程度（基尼系数）下降。

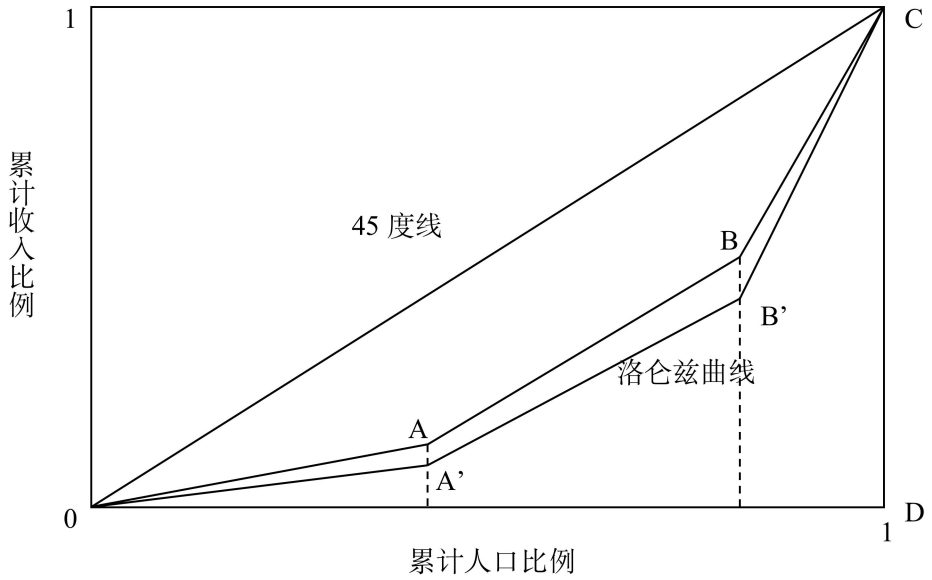
功利主义者会喜欢这种变化（因为他提高了每个人的收入，至少不变）。自由主义者也会欢迎这种变化（因为它增加了最低收入者的收入）。自由意志主者无所谓（因为他只关心机会而非结果平等）。



(3) 假定高收入者的收入提高，其他两个收入阶层收入没有变化。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

如下图。洛仑兹曲线下移至 OA’B’C (高收入者收入比例增加、中、低收入者收入比例下降)。收入不平等程度扩大。

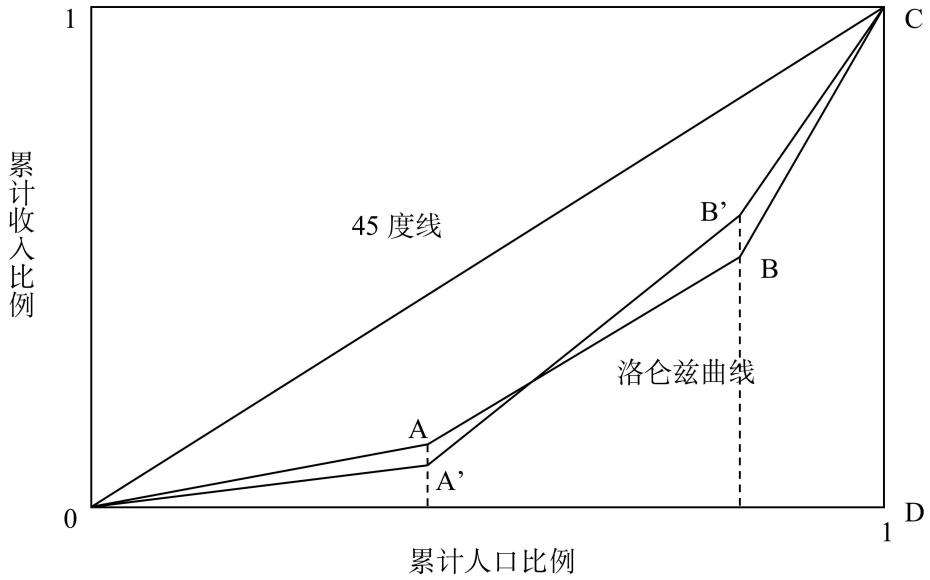
功利主义者喜欢这种变化；自由主义者和自由意志主义者均无所谓。



(4) 假定中等收入者收入提高，其他两个收入阶层收入没有变化。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

如图。新的洛仑兹曲线 OA’B’C 与原来曲线相交（低收入者、高收入者收入比例均下降）。收入不平等程度可能上升或下降，不能确定。

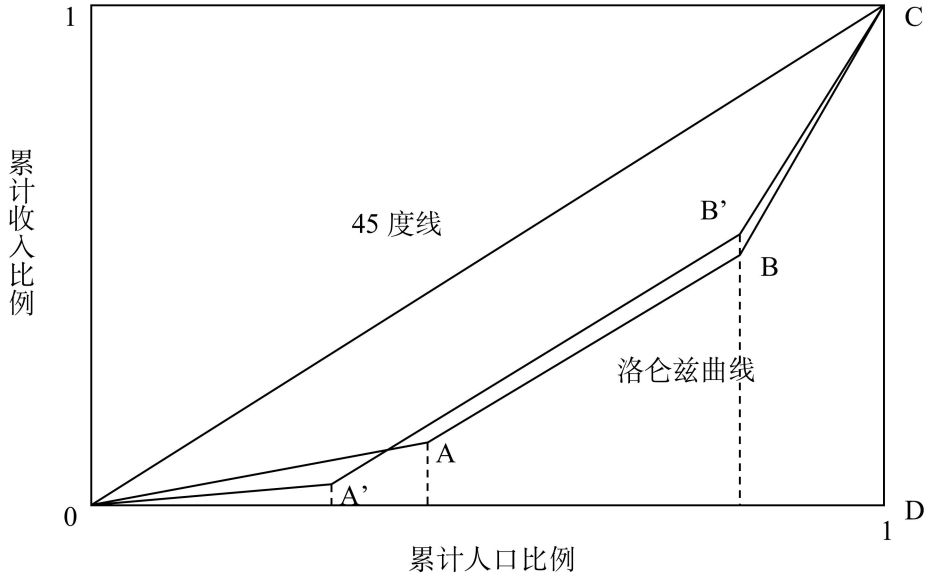
功利主义者喜欢这种变化。自由主义者和自由意志主义者无所谓。



(5) 假定部分但非全部低收入者收入上升，成为了中等收入者。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

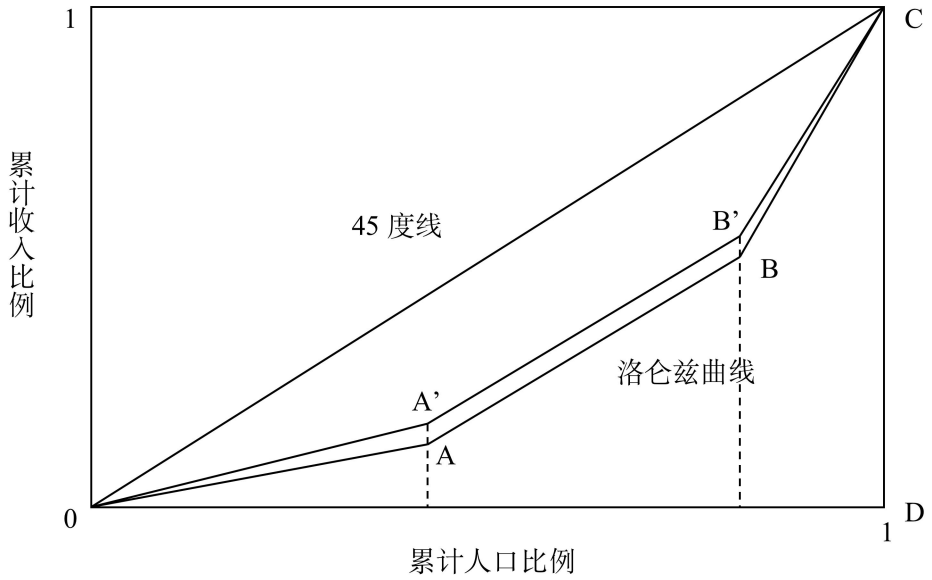
新的洛仑兹曲线 OA’B’C 与原曲线相交（理由：低收入人口比例减少导致 A 点左移至 A’点；同时，由于总收入上升，低收入者所占收入比例下降大于其人口比例下降，导致 A 点移至原曲线之下的 A’点。高收入者所占收入比例下降，但所占人口比例不变，B 点上移至 B’点）。收入不平等可能上升或下降，不能确定。（只有在极端情况下，例如低收入者全部成为中等收入者，才会导致收入不平等下降。）

功利主义者喜欢这种变化。自由主义者和自由意志主义者无所谓。（但是，极端情况下，如果低收入者全部消失，则自由主义者会喜欢这种变化。）



(6) 政府对每个高收入者征收相同数量的税收，并转移给每个低收入者相同的收入。但高收入者收入仍然高于中、低收入者。洛仑兹曲线将会如何变化？用图形表示。能够确定收入不平等程度如何变化吗？功利主义者、自由主义者和自由意志主义者会怎样看待这种变化？

如图。洛仑兹曲线向上移动至 OA'B'C（注意 AB 到 A'B'的移动是平行移动，因为中等收入者的收入比例不变）。收入不平等程度下降。
功利主义者喜欢这种变化（根据收入的边际效应递减）；自由主义者喜欢这种变化。自由意志主义者不喜欢这种变化（因为他们不支持任何形式的收入再分配。）



For Chapter 23

9. Textbook, Chapter 23, #1

1. a. Consumption increases because a refrigerator is a good purchased by a household.
   b. Investment increases because a house is an investment good.
   c. GDP is not affected because nothing new is produced.
   d. Consumption increases because a haircut is a service purchased by a household.
   e. Consumption increases because a car is a good purchased by a household, but investment decreases because the car in Ford's inventory had been counted as an investment good until it was sold.
   f. Investment increases because a car is an investment good to the car rental company.
   g. Government purchases increase because the government spent money to provide a good to the public.
   h. GDP is not affected because a Social Security check is a transfer payment, not a government purchase.
   i. Consumption increases because the bottle is a good purchased by a household, but net exports decrease because the bottle was imported.
   j. Investment increases because new structures and equipment were built.

10. Textbook, Chapter 23, #5

5. a. Calculating nominal GDP:

2016: ($1 per qt. of milk × 100 qts. milk) + ($2 per qt. of honey × 50 qts. honey) = $200

2017: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400

2018: ($2 per qt. of milk × 200 qts. milk) + ($4 per qt. of honey × 100 qts. honey) = $800

Calculating real GDP (base year 2016):

2016: ($1 per qt. of milk × 100 qts. milk) + ($2 per qt. of honey × 50 qts. honey) = $200

2017: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400

2018: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400

Calculating the GDP deflator:

2016: ($200/$200) × 100 = 100

2017: ($400/$400) × 100 = 100

2018: ($800/$400) × 100 = 200

b. Calculating the percentage change in nominal GDP:

Percentage change in nominal GDP in 2017 = [($400 – $200)/$200] × 100 = 100%.

Percentage change in nominal GDP in 2018 = [($800 – $400)/$400] × 100 = 100%.

Calculating the percentage change in real GDP:

Percentage change in real GDP in 2017 = [($400 – $200)/$200] × 100 = 100%.

Percentage change in real GDP in 2018 = [($400 – $400)/$400] × 100 = 0%.

Calculating the percentage change in GDP deflator:

Percentage change in the GDP deflator in 2017 = [(100 – 100)/100] × 100 = 0%.

Percentage change in the GDP deflator in 2018 = [(200 – 100)/100] × 100 = 100%.

Prices did not change from 2016 to 2017. Thus, the percentage change in the GDP deflator is zero. Likewise, output levels did not change from 2017 to 2018. This means that the percentage change in real GDP is zero.

c. Economic well-being rose more in 2017 than in 2018, since real GDP rose in 2017 but not in 2018. In 2017, real GDP rose but prices did not. In 2018, real GDP did not rise but prices did.

11. Textbook, Chapter 23, #9

9. a. GDP is the market value of the final good sold, $180.

b. Value added for the farmer: $100.
Value added for the miller: $150 – $100 = $50.
Value added for the baker: $180 – $150 = $30.

c. Together, the value added for the three producers is $100 + $50 + $30 = $180. This is the value of GDP. This example suggests that GDP could be calculated as the sum of the value added by all producers.

12. Textbook, Chapter 23, # 12

12. a. GDP equals the dollar amount Barry collects, which is $400.
b. NNP = GDP – depreciation = $400 – $50 = $350.
c. National income = NNP = $350.
d. Personal income = national income – retained earnings – indirect business taxes = $350 – $100 – $30 = $220.
e. Disposable personal income = personal income – personal income tax = $220 – $70 = $150.

13. 支出法 GDP 的计算

目前能够得到的我国年度 GDP 的最新数据为 2021 年数据。这可以通过查找《中国统计年鉴（2021）》或者登陆国家统计局网站（http://www.stats.gov.cn/）获得。通过查找数据，回答下列问题：

（1） 教材中对 GDP 构成的划分在我国被称为支出法 GDP。在年鉴中找出最近一年的支出法 GDP。它是根据什么价格计算的？反映的是名义值还是实际值？

亿元人民币
指标—国民经济核算—支出法国内生产总值。当年价格。名义值。

（2） 在年鉴中最近两年（即 2018、2019 年）的支出法 GDP 中，消费（C）、投资（I）

和净出口（NX）占 GDP 的比例各是多少？消费与投资的比例在两年之间的变化率（不是变化的百分数）是多少？

（3） 年鉴给出的最近两年之间 GDP 的增长率是多少？
指标—国民经济核算—国内生产总值指数—国内生产总值指数（上年=100）

（4） 你能否近似估计出消费、投资在最近两年间的实际增长率？说明你的计算过程。(提示：考虑通过第（2）问中得出的比例变化率、第（3）问中得出的 GDP 增长率来进行估算。)
使用近似公式：消费增长率 = 消费占 GDP 比例变化率 + GDP 增长率。(投资类似)
(推导如下：ΔC/C = C2/C1-1 = (C2/GDP2)*GDP1*(GDP2/GDP1)/C1-1
= [(C2/GDP2)/(C1/GDP1)]*(GDP2/GDP1)-1
= [1+%(C/GDP)]*(1+%GDP)-1 ≈ %(C/GDP)+%GDP)

（5） 政策制定者经常会关心在 GDP 整体增长的百分数当中各构成部分的增长，即各构成部分对于 GDP 增长的贡献百分数（contribution in percentage points）。例如，消费对 GDP 增长贡献百分数（或称拉动的百分数）的计算公式如下：

消费对经济增长贡献百分数 $_t$ = 消费增长百分数 $_t$ × 消费在 GDP 中所占的份额 $_{t-1}$

此处下标 t 表示年份。类似的，可以计算投资对增长的贡献率。解释这一计算公式。(提示：ΔGDP/GDP = (ΔC+ΔI+ΔNX)/GDP。)
GDP 增长率为：
ΔGDP/GDP = (ΔC+ΔI+ΔNX)/GDP= (ΔC/C)*(C/GDP)+ (ΔI/I)*(I/GDP)+ (ΔNX/NX)*(NX/GDP)
可见消费贡献百分数为：(ΔC/C)*(C/GDP)

（6） 计算消费、投资和净出口各自对中国最近两年间 GDP 增长贡献百分数，并与年鉴直接给出的百分数对比。消费、投资和净出口中，哪个在 GDP 的构成中所占比例最大？哪个在 GDP 增长中所贡献的百分数最大？为什么说扩大消费是经济增长的“关键”？

For Chapter 24

14. Textbook, Chapter 24, #5

5. a. The cost of the market basket in 2017 is (1 × $40) + (3 × $10) = $70.

The cost of the market basket in 2018 is (1 × $60) + (3 × $12) = $96.

Using 2017 as the base year, we can compute the CPI in each year:
2017: $70/$70 × 100 = 100
2018: $96/$70 × 100 = 137.14

We can use the CPI to compute the inflation rate for 2018:

(137.14 – 100)/100 × 100 = 37.14%

b. Nominal GDP for 2017 = (10 × $40) + (30 × $10) = $400 + $300 = $700.

Nominal GDP for 2018 = (12 × $60) + (50 × $12) = $720 + $600 = $1,320.

Real GDP for 2017 = (10 × $40) + (30 × $10) = $400 + $300 = $700.

Real GDP for 2018 = (12 × $40) + (50 × $10) = $480 + $500 = $980.

The GDP deflator for 2017 = ($700/$700) × 100 = 100.

The GDP deflator for 2018 = ($1,320/$980) × 100 = 134.69.

The rate of inflation for 2018 = (134.69 – 100)/100 × 100 = 34.69%.

c. No, it is not the same. The rate of inflation calculated by the CPI holds the basket of goods and services constant, while the GDP deflator allows it to change and holds the prices constant.

15. Textbook, Chapter 24, #6

6. a. introduction of new goods; b. unmeasured quality change; c. substitution bias; d. unmeasured quality change; e. substitution bias

16. 消费物价指数、GDP 平减指数与替代偏差

某国一个典型的消费者每年都会购买一件内衣。有两种内衣：白棉内衣和彩棉内衣，如果价格相等，消费者会认为彩棉内衣和白棉内衣没有任何差别。假定他每年只购买 1 件内衣。在 2005 年，他以价格 100 元购买了一件白棉内衣。此时，彩棉内衣的价格为 200 元。他在其他物品与服务上的花费为 800 元。

此外，该国的经济是一个封闭的“消费”经济。即该国每年的（人均）产出与当年的（人均）消费额相等。

（1） 在 2006 年时，彩棉内衣的价格为 50 元，白棉内衣价格不变。典型的消费者还会继续购买白棉内衣吗？

（2） 假定消费者在其他物品上的消费数量不变，其他物品价格也不变。以 2005 年为基年，2006 年的消费物价指数（CPI）为多少？以此衡量的通货膨胀率为多少？

（3） 以 2005 年为基年，2006 年的 GDP 平减指数为多少？以此衡量的通货膨胀率为多

少?

(4) 为使得该国典型消费者保持不变的生活水平，2006 年的生活费用应该是多少？由此你认为以 2005 年为基年的“理想”的生活费用指数为多少？以此衡量的通货膨胀率为多少?

(5) 消费者通过选择更为便宜的物品替代过去更为昂贵的物品，由此带来的物价水平与通货膨胀率的衡量偏差称为“替代偏差”。替代偏差使得 CPI 高估还是低估了通货膨胀率？使得 GDP 平减指数高估还是低估了通货膨胀率？并解释之。

(1) 在 2006 年时，彩棉内衣的价格为 50 元，白棉内衣价格不变。典型的消费者还会继续购买白棉内衣吗?

不会。

(2) 假定消费者在其他物品上的消费数量不变, 其他物品价格也不变。以 2005 年为基年, 2006 年的消费物价指数（CPI）为多少？以此衡量的通货膨胀率为多少?

2005 年生活费用为 100+800=900 元。固定篮子（即假定消费者仍然购买白棉内衣），2006 年的生活费用仍为 900 元。因此，2006 年的 CPI 指数为 900/900*100=100，与基年（2005 年）相同。
通货膨胀率：(100-100)/100*100%=0%。

(3) 以 2005 年为基年，2006 年的 GDP 平减指数为多少？以此衡量的通货膨胀率为多少?

2006 年 GDP 平减指数= (50+800)/(200+800)*100 = 85。
通货膨胀率：(85-100)/100*100% = -15%。
（GDP 平减指数 = 名义 GDP/实际 GDP*100
= 以当年价格衡量的人均消费额/以基年价格衡量的人均消费额*100）

(4) 为使得该国典型消费者保持不变的生活水平，2006 年的生活费用应该是多少？由此你认为以 2005 年为基年的“理想”的生活费用指数为多少？以此衡量的通货膨胀率为多少?

在 2006 年消费者选择购买彩棉内衣，生活水平即保持不变，生活费用为：50+800 = 850。
理想的生活费用指数为: 850/900*100=94.4。通货膨胀率: (94.4-100)/100*100 = -5.6%。

(5) 消费者通过选择更为便宜的物品替代过去更为昂贵的物品，由此带来的物价水平与通货膨胀率的衡量偏差称为“替代偏差”。替代偏差使得 CPI 高估还是低估了通货膨胀率？使得 GDP 平减指数高估还是低估了通货膨胀率？并解释之。

使得 CPI 高估了通货膨胀率，因为它“强迫”今天的消费者购买相对昂贵的物品，从而高估了今天的生活费用。

使得 GDP 平减指数低估了通货膨胀率，因为它“强迫”过去的消费者购买相对昂贵的物品，从而高估了过去的生活费用。