UNIT 5

coreecon

ANSWERS TO EXERCISES

EXERCISE 5.1 SUBSTANTIVE FAIRNESS

Consider the society you live in, or another society with which you are familiar.

1. To make society fairer, would you want greater equality of income, happiness, or freedom? Why? Would there be a trade-off between these aspects?
2. Are there other things that should be more equal to achieve greater fairness in this society?

Answer

1. Students may have different views on the suitability of the three attributes for substantive fairness. Income is easiest to measure. Measures of happiness and freedom exist, but there are differences of opinion on the adequacy of these measures. For example, is freedom a self-reported measure or an objective one? Is it defined as freedom to do certain things or freedom from certain constraints? In principle, one may want to ensure equality across all these measures, perhaps using some kind of index of human welfare. Freedom also may be considered an important aspect of procedural fairness, even if it cannot be easily measured for substantive fairness. Trade-offs between the three could arise since, for instance, equality of freedom may lead to an unequal distribution of income as individuals make different choices about participating in the labour force.
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2. Students may wish to discuss substantive fairness measures such as wealth, health outcomes, and educational outcomes.

EXERCISE 5.2 PROCEDURAL FAIRNESS

Consider the society in which you live, or another society with which you are familiar. How fair is this society, according to the procedural judgements of fairness listed above?

Answer

Procedural fairness concerns the rules of the game that brought about the allocation, rather than the allocation itself. In terms of the measures that are mentioned in the text:

- *Voluntary exchange of private property acquired by legitimate means:* Societies such as the UK have a large and complex set of laws designed to ensure that private property acquired legitimately

remains in the hands of the rightful acquirer. Should anyone illegally take property from another member of society, legal action can be used to hold them to account either through criminal or legal proceedings.

- *Equal opportunity for economic advantage*: In the UK it is possible for individuals from any background to succeed. There are numerous examples of people who have come from humble backgrounds to become well known and enjoy tremendous rewards. These include John Major, the former UK Prime Minister. who was the son of a bus driver; or Alan Sugar, who now owns a £800m company after starting off selling goods from a van at age 16. However, unequal access to certain institutions such as private schools and hospitals, which is related to family income, still mean that opportunities can depend on one's family circumstances. The under-representation of many groups (for example, those from low-income households) in the UK in highly paid professions and in higher education is evidence for this.

- *Deservingness*: The question here is whether the relative status of people in the UK economy is related to effort they have put into work and study. We would expect a higher degree of social mobility in the UK if this were true.

The Social Mobility Commission of the UK government has compiled data on social mobility in the UK (and its geographical variability). It shows that there is still considerable disadvantage in the UK and lack of social mobility based on area of residence. It suggests that effort pays off differentially within the UK.

Social Mobility Commission, 2016. *The Social Mobility Index*. UK Government (http://tinyco.re/8676549).

EXERCISE 5.3 SPLITTING THE PROFITS IN A PARTNERSHIP

Suppose you and a partner are starting a business involving each of you selling a new app to the public. You are deciding how to divide the profits and are considering four alternatives. The profits could be split:

- equally
- in proportion to how many apps each of you sells
- in inverse proportion to how much income each of you has from other sources (for example, if one of you has twice the income of the other, the profits could be split one-third to the former and two-thirds to the latter)
- in proportion to how many hours each of you has spent selling.

Order these alternatives according to your preference and give arguments based on the concepts of fairness introduced in this section. If the order depends on other facts about this joint project, say what other facts you would need.

Answer

There is no definitive answer here, and students will have to debate the good and bad points of the alternatives using the concepts of substantive and procedural justice.

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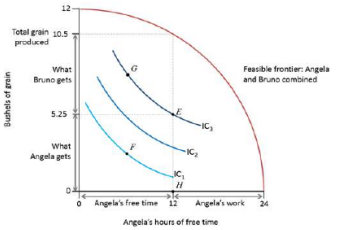
EXERCISE 5.4 USING INDIFFERENCE CURVES

In Figure 5.3, point F shows an allocation in which Angela works more and gets less than at point E, and point G shows the case in which she works more and gets more.

By sketching Angela's indifference curves, work out what you can say about her preferences between E, F and G, and how this depends on the slope of the curves.

Answer

G will be preferred to *F* because it contains more grain and the same amount of free time. It is therefore on a higher indifference curve. *E* is on a higher indifference curve than *F* because it contains more of both free time and grain. However, *G* could be on a higher or lower indifference curve than *E*. In the diagram, the intermediate case is shown where *E* and *G* are on the same indifference curve. If the indifference curve were flatter than the one shown so that it passed below *G*, then she would prefer *G*.



EXERCISE 5.5 CHANGING CONDITIONS FOR PRODUCTION

Using Figure 5.4, explain how you would represent the effects of each of the following:

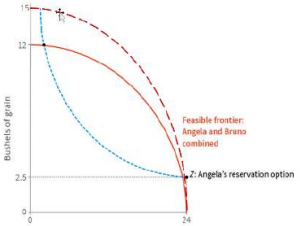
1. an improvement in growing conditions such as more adequate rainfall
2. Angela having access to half the land that she had previously
3. the availability to Angela of a better designed hoe making it physically easier to do the work of farming.

Answer

1. The line for the feasible frontier is higher for every hour of work Angela does except none.

2. The line is lower for every hour of work Angela does except none.

3. The line is higher for every hour of work Angela does except none. And the line for the biological survival constraint is lower because every hour of work is less demanding and requires fewer calories to sustain Angela.



EXERCISE 5.6 BIOLOGICAL AND ECONOMIC FEASIBILITY

Using Figure 5.6:

1. Explain why a point on the biological survival constraint is higher (more grain is required) when Angela has fewer hours of free time. Why does the curve also get steeper when she works more?
2. Explain why the biologically feasible set is not equal to the economically feasible set.
3. Explain (by shifting the curves) what happens if a more nutritious kind of grain is available for Angela to grow and consume.

Answer

1. Angela's biological survival constraint gets steeper as she works more because we assume she is getting increasingly tired and therefore working less efficiently (from a biological perspective). She will therefore need increasingly more grain for each hour worked.

2. The economically feasible set is the area between Angela's indifference curve and her feasible frontier. Angela now has an outside option and cannot be made worse off than this outside option. The economically feasible set is smaller than the biologically feasible set because there are points within the biologically feasible set that Angela likes less than the outside option. This means that there is some parts of the biologically feasible set that are not economically available, because Angela would never choose to work in this area.

3. As the grain is more nutritious, Angela needs to eat less of it to survive. Therefore, her biological survival constraint has shifted closer to the origin. Her feasibility frontier remains unchanged as nothing in the production process has changed. The shift in the reservation indifference curve depends on our assumptions about Angela's preferences. It will still pass through the reservation option, Z. If Angela cares about grain only for its nutritional qualities, the

indifference curve will become flatter; she will need fewer bushels of grain to compensate for one hour of work.

EXERCISE 5.7 WHY ANGELA WORKS FOR 8 HOURS

Angela's income is the amount she produces minus the land rent she pays to Bruno.

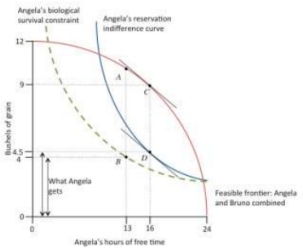
1. Using Figure 5.7a, suppose Angela works 11 hours. Would her income (after paying land rent) be greater or less than when she works 8 hours? Suppose instead, she works 6 hours, how would her income compare with when she works 8 hours?
2. Explain in your own words why she will choose to work 8 hours.

Answer

1. The figure is reproduced below. If Angela worked 11 hours she would have 13 hours of free time. If the rent that Bruno is charging remained at 4.5 bushels then she would now be worse off because the surplus generated at 13 hours of free time is less than 4.5, and so Angela would be below her reservation indifference curve. We know that the surplus at 13 hours of free time is less than 4.5 bushels because we know that the surplus is maximized at 8 hours of work, where it is exactly 4.5 bushels.
   Similarly, if she works 6 hours and has 18 hours of free time, the total surplus generated would be less than 4.5 bushels. If the rent remained at 4.5 bushels, Angela would be worse off.

2. Therefore the reason Angela works 8 hours is because this is the only level at which she is able to generate a surplus of 4.5 bushels which, after payment to Bruno, would leave her just on her reservation indifference curve.

Figure 5.7a Bruno's take-it-or-leave-it proposal when Angela can refuse



EXERCISE 5.8 TAKE IT OR LEAVE IT?

1. Why is it Bruno, and not Angela, who has the power to make a take-it-or-leave-it offer?
2. Can you imagine a situation in which the farmer, not the landowner, might have this power?

Answer

1. This is because Bruno owns the land, and therefore has the power to make the offer to Angela, who legally needs his permission to work the land. Angela owns her own labour so can choose to refuse to supply it, but Bruno may be able to employ any number of other farmers instead. Angela's alternatives may be more limited.

2. One could imagine other settings which give Angela some power in deciding how much she produces such as sharecropping or tenant farming. But this does not give her take-it-or-leave-it power. However, if she was a skilled farmer for a particular kind of high value product, or if farmers were in short supply, then she would have some power to make such an offer. Furthermore, if she were part of a trade union, she may also be able to credibly threaten to withhold her labour if her offer was not accepted.

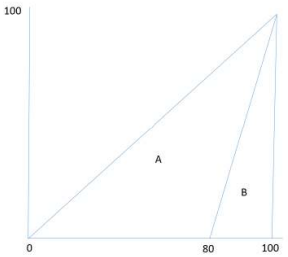
EXERCISE 5.9 COMPARING DISTRIBUTIONS OF WEALTH

The table shows three alternative distributions of land ownership in a village with 100 people and 100 hectares of land. Draw the Lorenz curves for each case. For cases I and III calculate the Gini. For case II, show on the Lorenz curve diagram how the Gini coefficient can be calculated.

I	80 people own nothing	20 people own 5 hectares each	
II	40 people own nothing	40 people own 1 hectare each	20 people own 3 hectares each
III	100 people own 1 hectare each		

Answer

1. In the diagram below the Lorenz curve is shown and the Gini is *A/(A + B)*. We can work out the area of *B* by noting it is a right-angled triangle with base 20 and height 100. So its area is 0.5 x 20 x 100 = 1,000. The area *(A + B)* can be found using the same formula with base 100 and height 100 to give 0.5 x 100 x 100 = 5,000. Then, area *A* is simply 5,000 - 1,000 = 4,000. Finally inserting these into the formula for the Gini gives 4,000/5,000 = 0.8.



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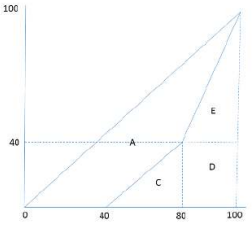
2. In the diagram below the Gini is given by *A/(A + C + D + E)*. The question does not ask for a calculation, but for the student to show how dividing the area into triangles and a rectangle allows the calculation to be made.



We can calculate *C* and *E* using the triangle formula used above. *C* is 0.5 x 40 x 40 = 800. *E* is 0.5 x 20 x 60 = 600. Then *D* is a rectangle whose area is 20 x 40 = 800. Thus, the area *(C + D + E)* = 2,200. The total area *(A + C + D + E)* = 0.5 x 100 x 100 = 5,000 which means that area A is 5,000 - 2,200 = 2,800. Using the formula for the Gini we get 2,800/5,000 = 0.56.

3. In this case there is complete equality. The Lorenz curve is the 45-degree line, and the Gini is 0.