

Examples and exercises on Pareto efficiency

Example

Consider an economy that contains only one good, which everyone likes. Then every allocation is Pareto efficient: the only way to make someone better off is to give them more of the good, in which case someone else will have less of the good, and hence be worse off.

Example

An economy contains two people and two goods, apples and bananas. Person 1 likes apples and dislikes bananas (the more bananas she has, the worse off she is), and person 2 likes bananas and dislikes apples. There are 100 apples and 100 bananas available.

The only allocation that is Pareto efficient is that in which **person 1 has all the apples** and **person 2 has all the bananas**. For any other allocation, one of the persons has some units of the good she does not like, and would be better off if the other person had those units.

Example

An economy contains two people and two goods, apples and bananas. Person 1 likes apples and doesn't care one way or the other about bananas (she is indifferent between any bundles (a,b) and (a,b') , where a is some number of apples and b and b' are numbers of bananas). Person 2 likes bananas and doesn't care one way or the other about apples. There are 100 apples and 100 bananas available.

The only allocation that is Pareto efficient is that in which **person 1 has all the apples** and **person 2 has all the bananas**. For any other allocation, one of the persons has some units of the good about which she doesn't care; transferring those units to the other person would have no effect on her and would make the other person better off.

Example

An economy contains two people and two goods, apples and bananas. Both people like both goods, but value them differently. For person 1, 1 apple is exactly equivalent to 2 bananas: she is indifferent between any bundles (a, b) and $(a - n, b + 2n)$, where a is some number of apples, b is some number of bananas, and n is some number. For person 2, 2 apples are exactly equivalent to 1 banana.

An allocation is Pareto efficient if and only if

- **either person 1 has no bananas**
- **or person 2 has no apples.**

Why? Suppose person 1 has some bananas and person 2 has some apples. Then by transferring one banana from person 1 to person 2 and one apple from person 2 to person 1 we make both of them better off. On the other hand, if person 1 has no bananas then any trade that makes her better off must involve her getting at least twice as many bananas as she gives up in apples, which results in person 2 being worse off. Similarly, if person 2 has no apples then any trade that makes her better off must involve her getting at least twice as many apples as she gives up in bananas, which results in person 1 being worse off.