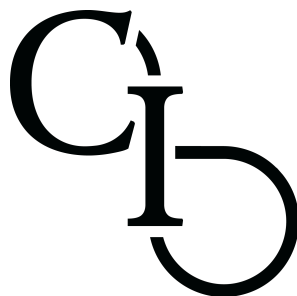


*Economics*

*Module 1*

# Preference Scales

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## Preference Scales

Consider a lone, modern man who has just washed up on the shore of an island. This man, Jack, has no technological means at his disposal, nor does he know anything about his new home. Initially, his only physical asset is his own body, which he may direct towards a large number of ends (he may use his legs to walk, his hands to grab things, his eyes to see, etc.). He is also equipped with a nontrivial amount of knowledge—just enough, perhaps, to bootstrap his way to survival. He knows he will die without food and water. He can guess that berries might grow inland and fish swim offshore. He knows that too much sunlight can harm him and open wounds can fester and kill him. And crucially, he knows his bare hands aren't the best he can do—a fishing net would catch more fish, a stick could reach further. His situation is improvable, and he knows it.

The action conjecture (see Module 0) tells us that an individual acts purposefully—he employs scarce means towards some desired ends. As soon as Jack understands his situation, he faces a limited set of options, and he can only pursue one at a time—he may choose to explore the shore for fish, build a rudimentary shelter along the beach using twigs and rocks he sees around him, or explore the island's interior. His body is *scarce* in the sense that it cannot be simultaneously employed towards all three of those *ends*. While fishing and building shelter would, if Jack was successful, result in a net increase in the consumer goods available to him, exploring the interior would not. Exploring the island's interior unto itself would not gain him berries to eat or caverns to use as shelter, but it could gain him useful *knowledge*, thereby expanding his options—his possible ends. Whenever we talk about an individual acting at a particular moment, we are taking their state of knowledge (their theories of how the world works, their values, and any relevant factual knowledge) as a given, knowing full well that updates to their knowledge will change their set of available options and their preference scale—that is, the order in which they prefer their various options.

For simplicity's sake, imagine that all three ends would cost Jack the same amount of time and effort, and that there was no risk in pursuing any of them—that is, that pursuing the ends guarantees that he attains them. He may then cleanly compare the three ends in terms of which would result in his greatest satisfaction relative to the others. For example, his preference scale may be such that he most prefers acquiring

fish, then acquiring shelter, and then acquiring knowledge of the island's interior. Because we have set the costs of attaining these ends to be equal, we know that Jack will pursue the end most valued on his preference scale—acquiring fish. In doing so, he is giving up pursuing the other two ends in the same timeframe. In particular, the *opportunity cost* of acquiring fish is what he would have done instead—the next item on his preference scale, acquiring shelter. Jack cannot employ his scarce means—his body—towards all three ends simultaneously and must therefore *economize*—he must employ his body only towards his most valued end. Because his body can go towards more of Jack's ends than it can possibly satisfy, it is an *economic good*.

Had the acquisition of fish been unavailable to him, or had he not considered it as a possibility, his most valued end would be acquiring shelter, and he would have pursued that instead. The opportunity cost of *that* would have been knowledge of the island's interior.

On the other hand, Jack may think of a new option before choosing between his ends, say, that he could rest on the beach in the same time as would be required to attain the other possible ends. This affects his ultimate choice only if resting on the beach grants him greater satisfaction than even his top choice of acquiring fish. If resting on the beach satisfies him less than eating fish, then the new idea would not affect his decision. But, while his decision has not changed, and the time and effort to acquire fish has not changed, his opportunity cost of choosing fish may have increased. Before the new idea, the best thing he was giving up was shelter. If resting on the beach is even more satisfying than shelter, then resting replaces shelter as the thing he's sacrificing. His opportunity cost rises as a result of a changing preference scale, which is now (1) acquiring fish, (2) resting on the beach, (3) acquiring shelter, (4) acquiring knowledge of the island's interior.

In acquiring fish, Jack increases his stock of *consumer goods*—goods that he consumes directly to satisfy his wants. He does this by transforming Nature's *raw materials* of fish-in-water into the consumer good of fish-in-hand.

Had Jack chosen to acquire a shelter, he also would have increased his stock of consumer goods (i.e., from zero shelters to one shelter) , but he would have needed to increase his stock in and employ *capital goods* (or *producer goods*) to do so—those goods that are not consumed directly but are instead created from Nature's raw materials and then

employed towards the creation of consumer goods. In particular, he would have taken the raw materials of nearby trees, transformed them into the building blocks of the eventual shelter (such as deliberately shaped wooden slabs and leafy covers), and then employed those capital goods towards the creation of the hut. In this case, the capital goods could only be used once, but in general this is not the case—a fishing net, for example, can be used many times.

Had Jack chosen to explore the island's interior, he would not have increased his stock of goods at all. However, he would have increased his knowledge, thereby expanding his set of options. As with the hypothetical new option of resting on the beach, fresh insights about the island's interior may not turn out to affect Jack's actual choices, since it could be that he still prefers acquiring fish more than any option that the additional knowledge of the island provides. On the other hand, he could, for example, discover a dense shrub of berries that he'd prefer to pick more than grabbing fish from the shore.

## Knowledge and Goods

When obtaining fish, Jack did not merely employ his body (which we may regard as a capital good). He also necessarily consumed air during the time that was required to capture fish. Jack did not have to economize air, as its supply is unlimited *relative to his possible ends*. In reality, air is no more unlimited than any other physical quantity in the universe, but with respect to how Jack might choose to economize his time and body, the amount of air available to him plays no role in his assessment of his various options. This would not be the case if the island was somehow cordoned off from the rest of the world such that, for example, there was enough air for him to survive for only one day (and assuming that he *knows* of this state of affairs). This would have a drastic effect on his preference scale, bringing to the fore options that were, in Jack's initial situation, far below all his highest ranked three options. In this new state of affairs, Jack may prefer to attempt to create a boat out of the island's raw materials as a means of (hopefully) escaping. Note that he *could* have attempted this in our original scenario, but he preferred to acquire fish instead. Imagine that, in our original scenario, building a boat and trying to escape (during a timespan of one day) was the sixtieth most valued end on his preference scale. In those circumstances, he would only pursue this end if his first fifty-nine possible ends were made unattainable.

As we saw with the admittedly contrived example of air, any part of Jack's environment can be made into an economic good by change of circumstances. But this conversion can also be caused by a change in an economic actor's *knowledge*. For example, the waters around the island are initially not an economic good for Jack, as its supply for bathing and catching fish is effectively infinite. But now suppose that Jack learns (we don't care how) that he can more effectively cleanse his wounds by immersing them in salt water. Further assume (implausibly) that he also learns that the waters in which he has been bathing and acquiring fish are salty, and that he has therefore learned of a new end to which the water may be employed. However, he may further learn (perhaps through a combination of theory and experience) that each time he dips a cut in the water, he drains out enough of the salt from the water that the water's effectiveness at cleansing his wounds decreases. Unlike the effectively infinite air around him, water is suddenly *not* infinitely plentiful *relative to one of Jack's newly discovered ends*. Before Jack learned that the water could alleviate his wounds, the water's salt concentration would have made no difference to his usage of it (assume that the density of fish is independent of salt concentration). But he happened to learn about a new means to employ the water such that its economization would be necessary to achieve his newly discovered end.

Thus, an economic actor's knowledge plays a fundamental role in determining whether a physical system is an economic good or a given part of his environment. Whether a resource is a capital good or a consumer good is similarly not intrinsic to the asset but depends on the economic actor's knowledge (and his preference scale, which is a kind of knowledge). We saw that Jack could have chosen to create the building blocks of a hut out of trees, but if he did not know that this was possible, then such 'building blocks' would not be capital goods that he could employ towards the creation of the consumer good that is the hut. That is, even if we carved out bits of trees with the same shape, texture, and every other characteristic as what the hut building blocks would have been, absent the knowledge of how to use them to build a hut, they are not building blocks at all but are in the same economic class as the trees from which they came.

Moreover, a physical system's status as consumer good or capital good is not an intrinsic attribute but similarly depends on the economic actor's knowledge of what he could do with it. For example, Jack may use a stick to more efficiently catch fish (here, the stick is a capital good employed to acquire the consumer good that is fish), or he may use it to

scratch his back (here, the stick is a consumer good used directly to attain a more satisfactory state of affairs—a less itchy back).

An economic good once thought of as only a consumer good or capital good may attain the status of both upon the acquisition of knowledge. For example, Jack may initially use fish only for direct consumption, but he may learn that he can lure landbound prey animals with fish that he had caught, thereby granting fish dual status as both a consumer good (when he eats them) and as a capital good (when he uses them to catch prey).

An economic actor may have knowledge of some physical system, but if he has no end towards which he would employ it, then it is not an economic good—that is, the system does not enter his preference scale and, therefore, his decision-making process. For example, Jack may discover a spiderweb on the island. Whether he is ignorant about how it may be used to achieve any of his current possible ends or whether he is ignorant about how the spiderweb may expand his set of possible ends, the spiderweb has the same economic status as the air around him—simply a given of his environment. Note that this shared status with the air is an approximation, since the air is nearly entirely uncontrollable, while he *could* squash the spiderweb—it is just that doing so would not improve his lot.

We have seen how Jack’s knowledge determines *which* physical systems are means that he may employ to achieve his ends, and that knowledge determines which elements of his environment constitute economic goods in general and capital goods and consumer goods in particular. Now, most of the capital goods that he knows how to create are not given as raw materials, and he must exert creativity to bring them about by transforming Nature. But how does he choose how much to divert precious time and energy away from acquiring consumer goods like fish towards the creation of capital goods like fishing nets? In the next Module, we will explain the relationship between saving, investment, and consumption with a concept called *time preference*.



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