A student asked me how efficiency relates to benefit-cost comparisons

Specifically, he asked, "Does undertaking a project increase social welfare if the benefits of the project are greater than its costs?

Assume one has correctly measured the benefits and costs of the project in $, and the benefits are greater than the costs.

What's the answer? Will implementing the project increase social welfare?

The fact that benefits are greater than costs just means that the amount of money the gainers would pay to have the project implemented is greater than what the losers would have to be compensated to accept the project.

We would describe this project as a *Potential Pareto Improvement* in that the gainers **could** pay off the losers and everyone **could** be better off.

One can conclude that before the project is implemented the allocation is inefficient and implementing the project increases efficiency.

If the compensation was paid when the project was implemented, the change would be a *Pareto improvement*. Many argue that Pareto Improvements increases social welfare. Some are better off, and no one is worse off.[1]

What if the compensation was not paid? We know the initial allocation was inefficient because one could have changed things and made everyone better off. Does undertaking the project w/o compensation increase social welfare?

It increases efficiency, but it does not necessarily increase social welfare. For example, what if the benefits all go to rich people and the costs are born only by the poor. Is undertaking the project w/o compensation efficiency increasing? Yes. But society might prefer the status quo.

If the benefits from a project, measured in dollars, are less than its costs, all measured correctly, implementing the project is not efficiency increasing (the project is not a Pareto Improvement nor a PPI). It is efficiency decreasing. That said, the project might increase social welfare. For example, many would argue that while increasing the minimum wage often makes things less efficient, increasing it is justified on equity grounds if it is the only politically feasible way to help the poor.

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[1] Note everyone would. For example, if the there were no losers and the only gainer is a despised billionaire, some people might conclude that while aggregate welfare increased, social welfare did not.

Benefit-cost analysis of government projects is quite common. It is mandated for many Federal projects.

An early example of benefit-cost analysis is embedded in what has become known as "Pascal's wager." Blaise Pascal (1623-1662) was, and remains, a famous French mathematician and Catholic philosopher.

Blaise had a benefit-cost argument for why you should believe in God.

If God exists and you believe, you get bliss for eternity
If God exists and you don't believe, you get hell (immense suffering) for eternity
If you don't believe, you get to experience some sinful pleasures during your lifetime (very short compared to eternity).
If you believe, you miss out on some sinful pleasures during your lifetime, but maybe experience some pious joy, and experience joy from the belief you will get, when dead, eternal bliss.

Sounds like a "no brainer" in terms of the benefits and costs, unless you have a very high discount rate.[2]

For the Stanford Encyclopedia's take on Pascal's wager, see
http://plato.stanford.edu/entries/pascal-wager/

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[2] The argument is not without problems. On problem, phased over by Blaise, is not everyone agrees on who is God, so you might go to hell because you believed in the wrong one. Another issue: maybe God thinks it more rational for us not to believe in him, and likes rationality, so sends to hell all of the believers, and to heaven all of the non-believers.

For those convinced by the argument but having trouble, in their heart, believing, Pascal suggested faking it, arguing that if you faked belief long enough you would start believing.

As in, if you do not love your partner, fake it, and faking will make you love him or her.