

Innovation and competitiveness

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Economics of innovation

Introduction

We have seen how innovation can contribute to wealth creation.

We argued that the effects on innovation were not limited to the channel described in the simple linear model, but were much more diverse.

Moreover, the model we used, contained a large number of feedback effects. So, in short, the effects of innovation on wealth creation could follow quite a variety of complex paths.

Now, having said all that, the immediate reason why most companies innovate is not, in the first instance, because that increases wealth in the economy.

More often, the immediate reason is that innovation enhances their **competitiveness** and is perhaps essential for their survival.

Introduction

In short, if we focus on producer-centred innovation, we must recognise a potential divergence of objectives. As economists, our objective in encouraging innovation stems from its wealth-creating effects. But those who innovate have a different objective: to ensure their competitiveness and survival.

Does this difference in objectives matter?

This is a very fundamental question.

If we believe in the simple linear model then it could be argued that the difference in objectives does not matter. For that simple model, the only way in which innovation can impact on wealth is if companies market new and improved products and services or offer better value for money. Companies have their own motivation, albeit a different one, for doing this. And when they have innovated, we can wait for the wealth-creating effects to follow.

So even though there is a difference in objectives, innovation still takes place and will succeed in satisfying both objectives.

That argument is too simplistic however.

Introduction

We shall see in this lesson that the value of innovations to the innovator is not necessarily directly related to the value of these to the customer for the innovations.

This means that the divergence in objectives may lead to an imbalance in the sorts of innovations we see.

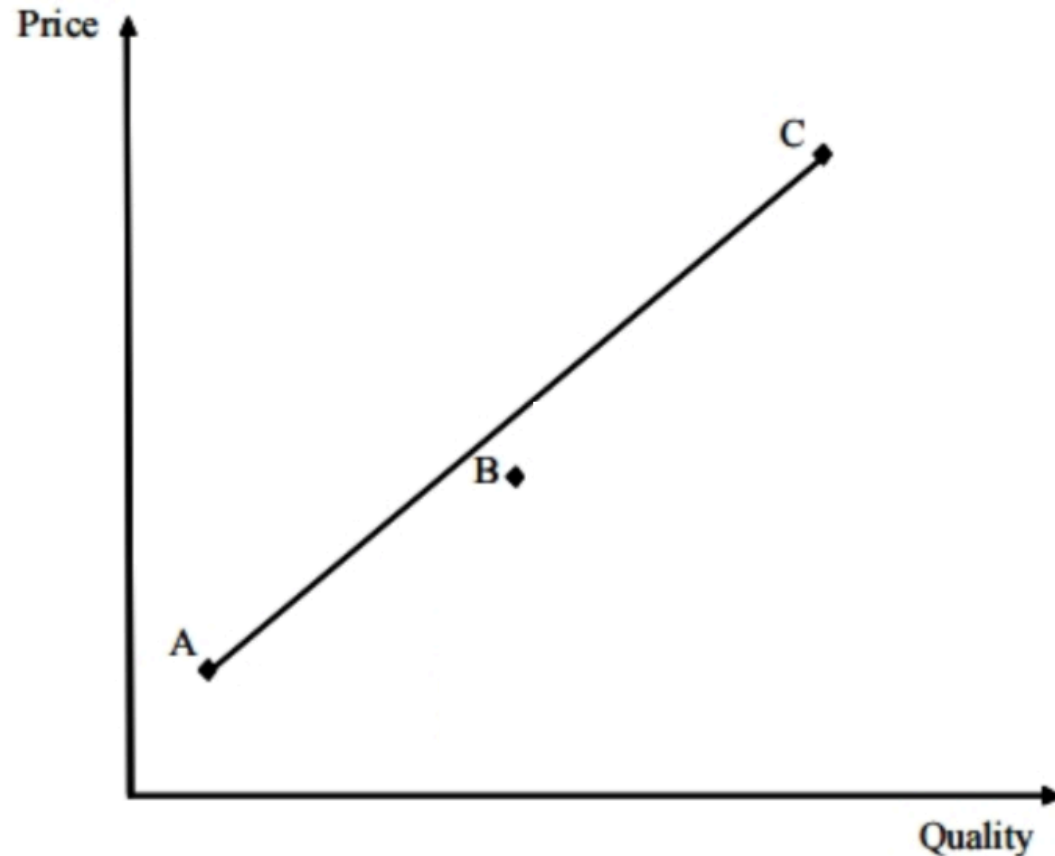
Moreover, when we admit a more complex model, then it is much harder to maintain that a difference in objectives does not matter. Innovation can impact on wealth creation in different ways.

The approach to innovation that might maximise wealth creation may look very different to the strategy for maximising competitiveness of the innovator.

Introduction

- In this lesson we will outline that the value of innovations to the innovator is not necessarily directly related to the value of these to the customer for the innovations.
- Finally, we will show that to have a preoccupation with the effects of innovation on competitiveness is equivalent to ignoring some important parts of the complex model.

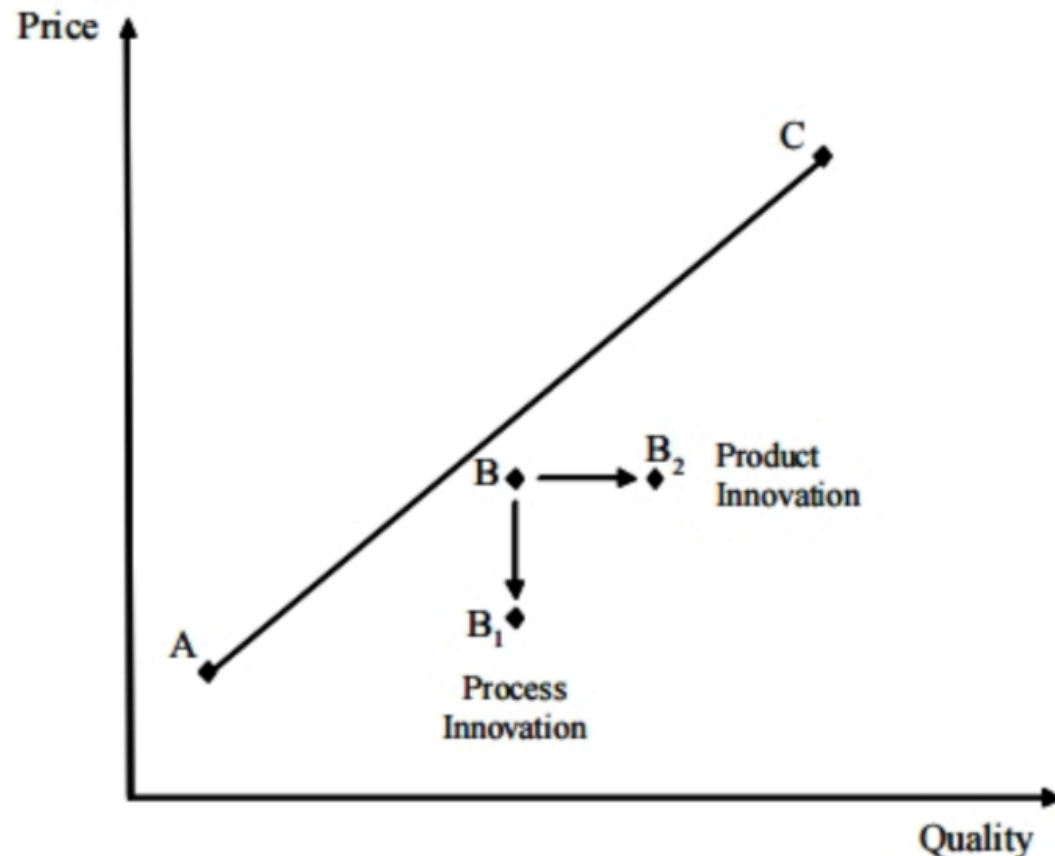
HOW INNOVATION ENHANCES COMPETITIVENESS



Here we have a very simple diagram which describes how innovation enhances competitiveness.

The diagram shows a product market with three competing products: A, B, and C. As drawn, and if we assume that all consumers have WTP (willingness-to-pay) lines as shown, product B does not look very competitive. Most consumers would prefer A or C, and only a very few (such as those with the WTP line as drawn) will wish to choose B.

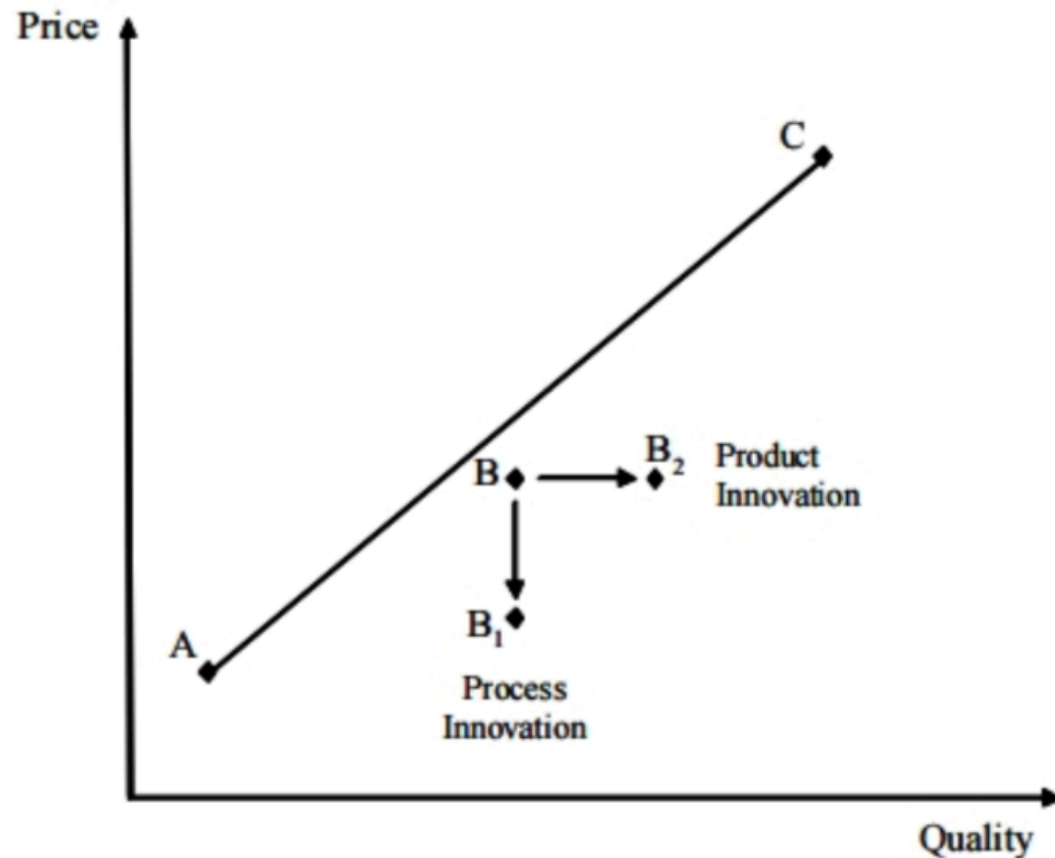
HOW INNOVATION ENHANCES COMPETITIVENESS



But the producer of B can change that if he uses a product or cost-reducing process innovation.

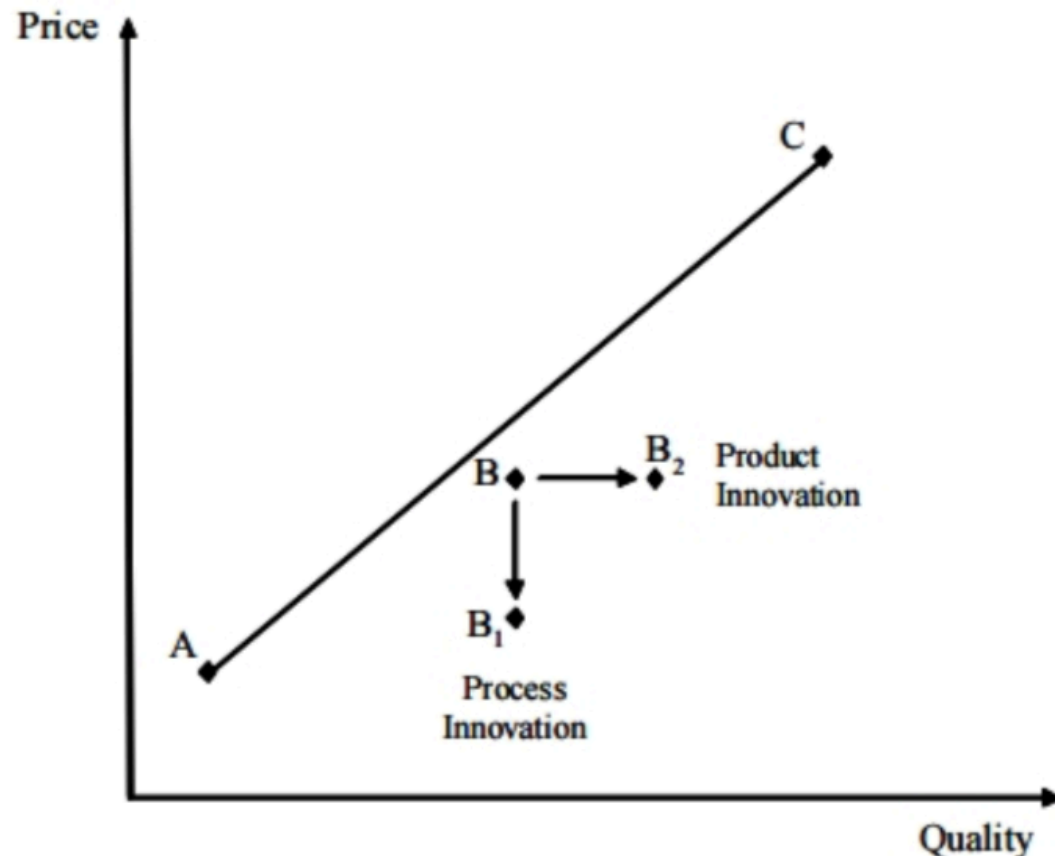
The cost-saving process innovation would allow that producer to relocate B to a reduced price (B₁). Alternatively, the product innovation (with no addition to costs) would allow that producer to relocate B to a higher quality (B₂). Both of these moves make B more competitive.

HOW INNOVATION ENHANCES COMPETITIVENESS



Moreover, we should add that the same diagram could equally well be used to represent other dimensions of competitiveness such as: delivery times, the service element, or any other factors that might make a customer choose product B rather than A or C

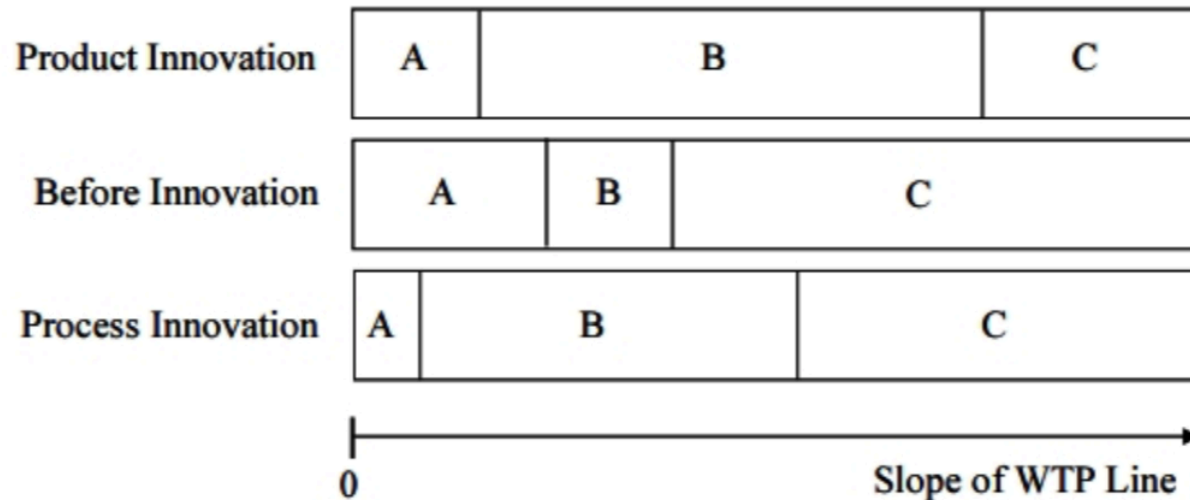
HOW INNOVATION ENHANCES COMPETITIVENESS



The move to B1 brings B closer (both in terms of the diagram and in economic terms) to product A. Intuitively, we would expect this price reduction to mean that B cuts significantly into the market share of product A. On the other hand, the move to B2 brings B closer to product C. Intuitively, we would expect this quality increase to mean that B cuts significantly into the market share of product C.

The product territory map confirms these intuitions.

Product territory maps before and after innovations



The figure shows the product territory maps before any innovation (the middle row), after the product innovation (top row) and after the process innovation (bottom row).

Compared to the pre-innovation picture, both innovations allow product B to capture a larger market share. But they achieve this increased market share in different ways.

- The process innovation takes market share from A and C: the territory for B expands more or less equally in both directions.
- The product innovation, by contrast, mostly takes share from product C and much less so from A.

As drawn, the difference between the top line and bottom line in figure may not seem great. But in more complex settings with more competing products and more dimensions of quality, the difference in effect of product and (cost-reducing) process innovations can be very substantial.

THE VALUE OF AN INNOVATION: INNOVATOR AND CONSUMER PERSPECTIVES

The value of the innovation to the innovator is the effect on competitiveness.

Increased competitiveness will show up as increased market share.

Now what we find in such cases is that if a product is only just competitive (that is, it would only be bought by a tiny proportion of customers, with WTP lines as shown), then even a small innovation in B will be of considerable value to the producer.

Even a small innovation may be enough to secure a substantial gain in market share. This observation suggests that when the objective of innovation is to steal market share off rivals, then trivial innovations may be far more valuable to the producer than to the customer.

A technical analysis of this point is beyond the scope of this lesson, but the following examples illustrate the point well.

THE VALUE OF AN INNOVATION: INNOVATOR AND CONSUMER PERSPECTIVES

Consider the following selling innovations:

1. A telephone sales team 'cold calls' potential customers to try to persuade them to switch their electricity supplier.
2. Representatives of credit card companies try to persuade shoppers in supermarkets and service stations to take out a new credit card with preferential terms.
3. Companies send 'junk mail' to try to persuade customers to buy an improved product or service.

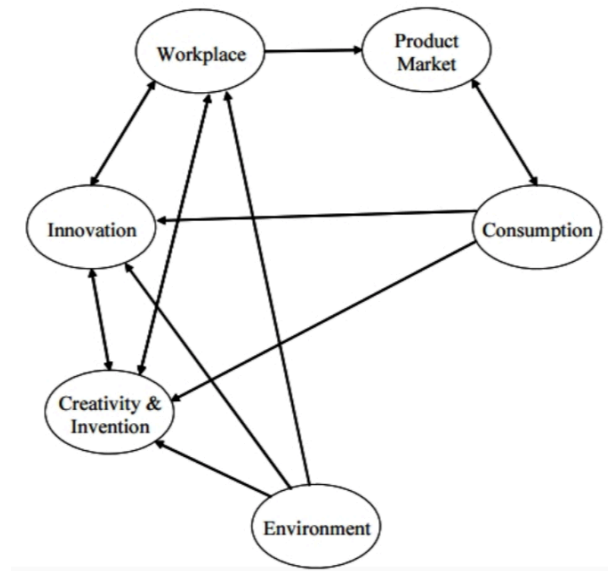
THE VALUE OF AN INNOVATION: INNOVATOR AND CONSUMER PERSPECTIVES

In each case, these innovations can be very successful from the point of view the seller because even if only a few customers 'bite' at the offer, this will be enough to make a mark on market share.

But the value of these innovations to the customer is very limited – and in some cases is negative!

The view that any innovations that are good for the competitiveness of the innovator will automatically be equally good for the wealth of the consumer is too simplistic.

A SUBSET OF THE COMPLEX MODEL



This view of innovation recognises more than the simple linear model.

It recognises a role for the customer in influencing the firm's strategy for creativity and innovation, and influencing those who design the marketplace.

It recognises that creativity and the environment may have a direct impact on the workplace.

And it recognises the potential importance of feedback from innovation to creativity. But it misses everything else.

Does that matter?

- For those charged with ensuring the competitiveness of a company, no, it doesn't matter. They are right to limit their attention to those relationships in Figure.
- But for those trying to design policies to promote the wealth-creating effects of creativity and innovation, then yes, it does matter.

The approach to policy that will maximise the effects on competitiveness in Figure will not necessarily be the same approach as that which would maximise wealth creation in the complex model.

This is an essential point, but one that is often overlooked in the business and policy communities.

Innovation and sustainability

Introduction

What topic in innovation could be more important than the issue of how it is harnessed to ensure economic sustainability?

With this lesson we will highlight two very important issues that every student of innovation should think about.

1. will markets give enough support to innovations that improve sustainability?
2. why does innovation have unexpected side-effects that threaten sustainability?

DO MARKETS SUPPORT SUSTAINABLE INNOVATIONS?

Suppose an innovator comes up with an improved version of a product (X2) which is more environmentally friendly than the original version (X1).

Will the market provide enough incentive for the innovator to introduce the environmentally friendly version?

A typical economist's response might be as follows.

If the environmentally friendly version (X2) is more expensive than the original (X1) then the market may not support it. The customer faced with a choice between X1 and X2 may stick with former because it is cheaper and the benefits of the latter are not fully understood. Or, even if the customer understands the environmental benefits in principle, he reasons that his personal consumption behaviour could only make a negligible effect on the environment. Either way, the market does not support the new version (X2).

DO MARKETS SUPPORT SUSTAINABLE INNOVATIONS?

This is a standard argument about the effects of externalities.

- If a product (X1) generates **positive** externalities for the environment, then there will be a tendency to produce and consume too much for the good of the environment.
- But if a product generates **negative** externalities for the environment, then there will be a tendency to produce and consume too little for the good of the environment. And that is what happens here.

How do we resolve this problem of externalities?

The generic solution is to internalise the externalities. This could be done by taxing those who use 'dirty' technologies in proportion to the environmental damage they do, and/or subsidising those who use 'clean' technologies. That is the sort of reasoning that underpins the current approach to carbon pricing: those who leave a large carbon footprint have to pay for the privilege by buying carbon emission permits, while those who think they could adopt a cleaner technology which leaves a modest carbon footprint can benefit from their virtue by selling their carbon permits.

DO MARKETS SUPPORT SUSTAINABLE INNOVATIONS?

Another approach to dealing with the problem of externalities is to set standards and regulations for polluting emissions.

By this approach, producers and users simply must adopt sufficiently clean technologies: to continue to use a 'dirty' technology and pay for the right to do so is not an option.

In that case, if the new product (X2) meets the standards and regulations while the old product (X1) does not, then the market will support the adoption of X2.

Opinions vary on the relative merits of these two approaches.

The relative merits of the two are a little bit like the relative merits of rationing by price and rationing by queuing. If we ration a scarce resource by price, then the rich customers who can afford a high price tend to get what they need, while the poor customers do not. If we ration by queuing, the distributional effects are perhaps fairer, but arguably the effects on economic efficiency are not so favourable because those to whom the rationed good is most valuable get no more than the rest.

DO MARKETS SUPPORT SUSTAINABLE INNOVATIONS? An example

In Italy the 2022 Furniture and Appliances Bonus consists of a 50% personal income tax deduction for the purchase of furniture and appliances of at least A + class (A for ovens), intended to furnish a property undergoing renovation.



There's no alternative to sustainable development.

- Even so, many companies are convinced that the more environment-friendly they become, the more the effort will erode their competitiveness. They believe it will add to costs and will not deliver immediate financial benefits.
- Talk long enough to CEOs, particularly in the United States or Europe, and their concerns will pour out: Making our operations sustainable and developing “green” products places us at a disadvantage vis-à-vis rivals in developing countries that don't face the same pressures. Suppliers can't provide green inputs or transparency; sustainable manufacturing will demand new equipment and processes; and customers will not pay more for eco-friendly products during a recession. That's why most executives treat the need to become sustainable as a corporate social responsibility, divorced from business objectives.
- Not surprisingly, the fight to save the planet has turned into a pitched battle between governments and companies, between companies and consumer activists, and sometimes between consumer activists and governments. It resembles a three-legged race, in which you move forward with the two untied legs but the tied third leg holds you back.
 - One solution, mooted by policy experts and environmental activists, is more and increasingly tougher regulation. They argue that voluntary action is unlikely to be enough.
 - Another group suggests educating and organizing consumers so that they will force businesses to become sustainable. Although both legislation and education are necessary, they may not be able to solve the problem quickly or completely.

There's no alternative to sustainable development.

Executives behave as though they have to choose between the largely social benefits of developing sustainable products or processes and the financial costs of doing so.

But that's simply not true.

The research shows that sustainability is a mother lode of organizational and technological innovations that yield both bottom-line and top-line returns. Becoming environment-friendly lowers costs because companies end up reducing the inputs they use.

In addition, the process generates additional revenues from better products or enables companies to create new businesses. In fact, because those are the goals of corporate innovation, smart companies now treat sustainability as innovation's new frontier.