

Innovation and wealth creation

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Economics of innovation

What is wealth?

It is not easy to define wealth.

J.S. Mill asserted in the introduction to Principles of Political Economy *‘every one has a notion, sufficiently correct for common purposes, of what is meant by wealth.’*

- We know that a wealthy country is capable of producing a large stock of useful things, whether products or services.
- We know that a wealthy country has a large stock of financial reserves which underpins its international trade and thereby allow the country to procure more useful things.

In all this we are, for the most part, talking about material wealth: tradable goods and services.

What is wealth?

John Ruskin, held a very different opinion, he took exception to Mill's remark:

"There is not one person in ten thousand who has a notion sufficiently correct, even for the commonest purposes, of 'what is meant' by wealth; still less of what wealth everlastingly is".

Ruskin believed that this lack of precision about what constitutes wealth was having very unfortunate implications.

- Industrialisation and laissez-faire appeared to be a path to maximising material wealth. But in Ruskin's view, industrialisation and laissez-faire were certainly not the right paths to maximising wealth in the sense that he understood it.
- Ruskin made an essential distinction between mercantile wealth, meaning traded wealth, and wealth in a broader sense. He suggested a definition of beautiful simplicity:

'There is no wealth but life'.

Ruskinian wealth is much closer to quality of life -> He observed that many who were wealthy in a mercantile sense were not capable of real wealth because they did not know how to turn their material wealth into real quality of life.

What is wealth?

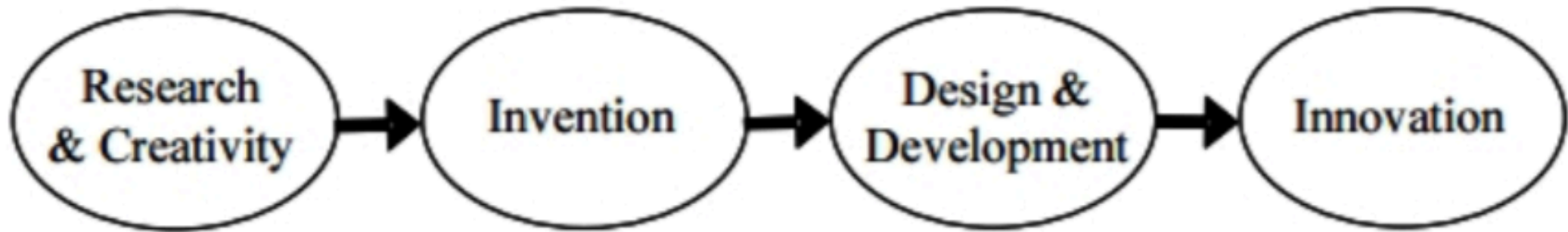
- Now, some economists might acknowledge this distinction, but respond that economics is only concerned (and can only be concerned) with mercantile wealth.
- But there is much discussion in the recent economics literature on the relationship between economic growth and happiness, and that finds the relationship is by no means straightforward.
- We cannot divorce our study of wealth creation from the discussion of wealth in this broader sense.
- In what follows, we will use a broader Ruskinian definition of wealth.

Summarizing: What is wealth?

Meracantile Wealth	Ruskinian wealth
<p>A wealthy country is capable of producing a large stock of products or services.</p> <p>A wealthy country has also a large stock of financial reserves which underpins its international trade and thereby allow the country to procure more useful things.</p>	<p>Ruskin suggested a simpler definition '<i>There is no wealth but life</i>'.</p> <p>A definition closer to quality of life. He observed that many who were wealthy in a mercantile sense were not capable of real wealth because they did not know how to turn their material wealth into real quality of life.</p> <p>There is a relationship between economic growth and happiness</p>

A simple story

The simplistic linear model

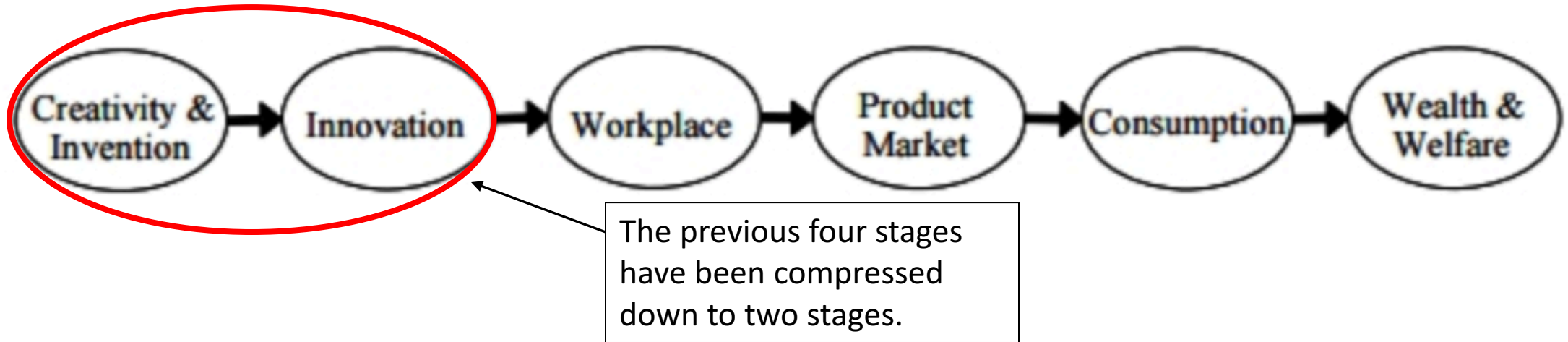


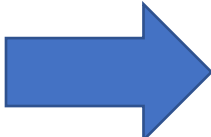
Do you remember about this model?

With luck and hard work, research and creativity will generate promising inventions and after a lot of development and design work these can grow into commercially viable innovations....

What happens next? 

The simplistic linear model



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- The innovations are adopted in the **workplace**.
 - After a while the company will be in a position to offer some new and more attractively priced **products in the marketplace**.
 - If these are of interest to consumers, then these products will be **bought and consumed**.
 - And as a result, the consumer will be better off – both in terms of material **wealth** and, we hope, in terms of **welfare**.

The simplistic linear model



According to this simple model, then, the wealth-creating effects all follow one channel. The model asserts that:

- **Creativity and invention** can only create wealth if channelled through **innovation**.
- And **innovation** can only create wealth if it is channelled through the **workplace** and through the outputs of the workplace which are sold in a **product market**.
- And the model then asserts that the only route to **wealth creation and welfare** is through **consumption**.

The simplistic linear model: some critics

But this can be defined as an extremely limited viewpoint!

1) it is not hard to think of other channels through which creativity may enhance welfare and wealth (in a Ruskinian sense).

Eg. many enlightened people follow hobbies that use their own creativity to enhance their Ruskinian wealth and welfare.

2) the viewpoint is far too limited because it neglects reverse linkages.

Eg. in the model, there is no feedback from innovation to creativity, and in practice there are many such linkages.

This simple linear model also leads us to make other, potentially serious, errors.

- if the only route to wealth creation is through the outputs of the workplace,
- it is understandable that we should be preoccupied with productivity growth, and indeed many economists are indeed very preoccupied with that.

As we know innovation is an important source of productivity growth. But some, indeed, have gone as far as to suggest that innovation only matters in the economy to the extent that it increases productivity. That seems gross error: there is much more to innovation than productivity growth alone.

To avoid such errors it seems essential that we set out a much more **complex and interactive** model of how creativity and innovation create wealth.

A complex story

Complex interactive model

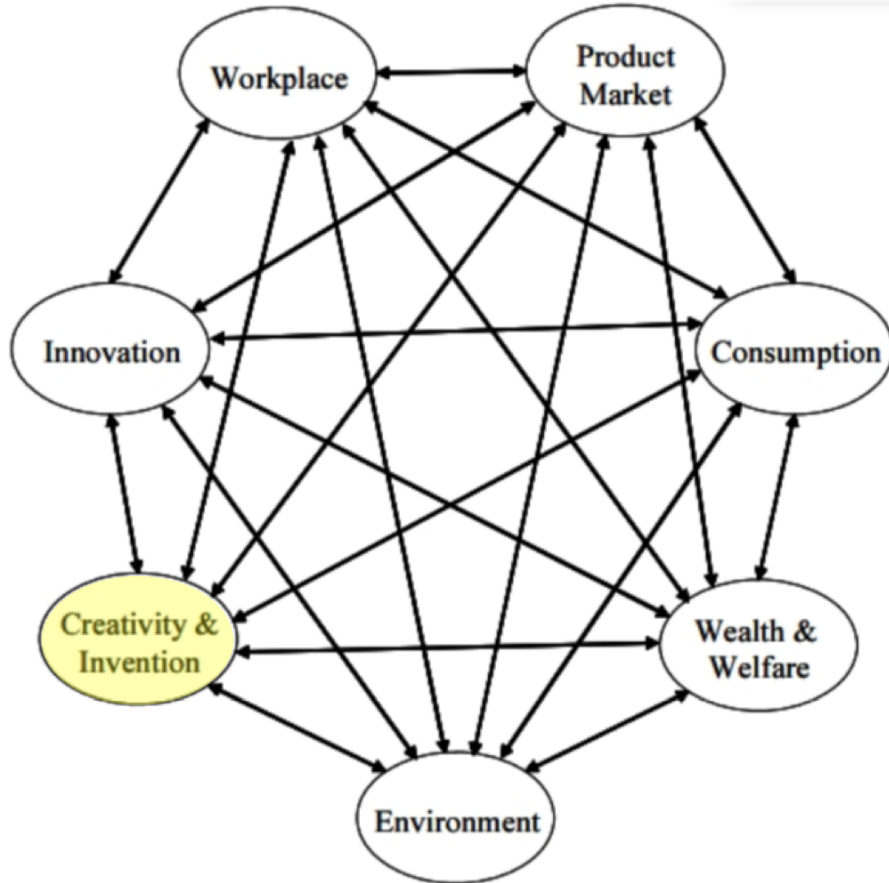
The complex linear model could be said to leave no holds barred. In principle, everything relates to everything else. This makes it very complex and very multifaceted.

But it is important to start to learn how to think within such a complex model because that is a much closer approximation to reality.

In this new model it is introduced the environment. The reason for doing that is threefold:

1. some innovations, unintentionally perhaps, can have adverse effects on the environment.
2. if we take the concept of Ruskinian wealth seriously, the environment itself is still an essential source of Ruskinian wealth for many people.
3. there is some evidence that a favourable environment can have a beneficial effect on some of the other activities considered.

Complex interactive model



Are all of these linkages really important?

We don't assert that all linkages are equally important but may be all of them exist and we would do well to try to understand them.

And where are we to start?

We can start anywhere we like, but we will progress around the diagram in a clockwise direction, starting with creativity and invention.

We now will list some of the potential effects of each variable on the others in the diagram. Many of these will be positive relationships but some are negative.

SOME EFFECTS OF CREATIVITY AND INVENTION

Let us suppose that the oval marked 'creativity and invention' represents all the creativity and invention in Italy. That is a lot of creativity and a lot of invention. Where does it all go?

The simple model would have us believe that either:

- (a) it is all channelled through innovation and the workplace;
- (b) or it does not contribute to wealth creation.

I do not dispute that organisations find creativity difficult to manage unless it is channelled through the discipline of design or innovation. But it is most unlikely that creativity plays no part in wealth creation unless it contributes to innovation.

Only a few of us contribute our creativity to innovation in the Schumpeterian sense. The rest of that creativity must go somewhere. Perhaps some of it is lost to wealth creation but I suspect that much of it is not. Rather, it contributes to wealth creation in quite different ways.

SOME EFFECTS OF CREATIVITY AND INVENTION – on the workplace

We have already commented on the link from creativity and invention to innovation because that was part of the simple linear model.

There is a direct linkage from creativity to the **workplace** which bypasses innovation?

In many organisations, there is.

Some innovative companies make a virtue of allowing their staff a certain percentage of the working week (perhaps 10%, or one afternoon a week) to give vent to their own creativity and invention by pursuing their own ideas for new products and processes. Many of these will never see light as commercially viable innovations and indeed, it is not the company's intention that they should – though occasionally some very successful innovations may stem from this. Rather, the objective is to encourage staff to develop their own human capital and in doing so raise their morale and commitment to the company. Some organisations, indeed, use this as a kind of non-pecuniary advantage to retain their most capable staff. Or it could be seen as part of an efficiency wage strategy.

Eg. Company A offers this advantage while most competitors do not. This means that staff will be motivated to work hard for company A because they know that if they shirk and are dismissed, they will no longer be able to enjoy that advantages. In this way, allowing staff to use their creativity within the workplace will enhance productivity in the workplace but not because it contributes to innovation.

SOME EFFECTS OF CREATIVITY AND INVENTION – on the consumption

In the same way, it seems certain that there is a direct link from creativity to **consumption**, which bypasses innovation as such.

Marshall (and McCulloch's) describe the consumer as active (or innovative):

“The gratification of a want or a desire is merely a step to some new pursuit. In every stage of his progress he is destined to contrive and invent, to engage in new undertakings; and when these are accomplished to enter with fresh energy upon others”.

This consumer is *‘destined to contrive and invent’*. And in doing that, he will often use his own creativity rather than buy such creativity in a marketplace.

This use of the consumer's own creativity is indeed an essential part of wealth creation for the Marshall consumer.

We do not increase the welfare of the Marshall consumer just by getting him to consume more and more.

Rather, the welfare of the Marshall consumer is increased when he uses his creativity and some purchases in the marketplace to *‘engage in new undertakings’*.

SOME EFFECTS OF CREATIVITY AND INVENTION – on the wealth creation

Again, there is some linkage from creativity direct to **wealth creation**:

Eg., some people get pleasure from creative writing even if they know that they will find no market for their work and even, perhaps, that nobody else will ever read their work. Equally, many get pleasure from sketching and drawing even if, once again, it is purely for themselves and they will never sell their work.

Now, it could be argued that both these activities require some **consumption** (pen and paper) so should be seen as creative consumption. But here, the element of consumption is so trivial that I prefer to call this a direct link from creativity to (Ruskinian) wealth creation.

Now, of course, it is arguable that there is also a negative relationship here. Creativity can be a painful process and that may lead to poverty and alcoholism, both of which reduce Ruskinian wealth as well as material wealth.

SOME EFFECTS OF CREATIVITY AND INVENTION - on the environment

Finally, we can see a direct linkage from creativity to the **environment**.

At a modest level, I make my garden a more pleasant place by using my creativity. This is not pure creativity, perhaps, because there is some outlay on plants and tools. But I would not call this hard work 'consumption'. Others do the same in their own houses: they use their own creativity to make their houses more attractive. It may even become an art form with feng shui.

All of these applications of creativity contribute to Ruskinian wealth.

SOME EFFECTS OF INNOVATION

Now we turn to the effects of innovation. Many of these effects are directed at and felt in the **workplace**.

There is, also, an important feedback from innovation to **creativity and invention**.

This is something that concerns governments a great deal. The British government is constantly arguing that researchers in universities should improve their dialogue with innovators in companies. Some business-people argue that this is necessary to ensure that academics do 'business relevant' research and are discouraged from doing the 'blue skies' research of no obvious industrial applicability. Other more enlightened business-people recognise it is better if academics keep their 'blue skies' work going, but in doing it take note of what is happening in industry and therefore how industry might realise commercial benefits from the research. Many academics find that dialogue with industry and policy raises many interesting research questions and that is an essential feedback mechanism.

SOME EFFECTS OF INNOVATION

Second, we could argue that some innovation is destined directly for the **marketplace** rather than the workplace as such.

- We can talk about innovations such as the supermarket or e-business which shape the marketplace itself rather than change the products and services available in the marketplace. The supermarket has been an immensely powerful retail innovation. It is not so much that the goods and services traded in supermarkets are different from what is available elsewhere, though obviously supermarkets offer very wide choice and in some cases at very low prices. Rather, the power of the innovation is the convenience it offers the consumer. Equally, e-business is an innovation which would have been of huge interest to Schumpeter because it does, in effect, create a new sort of marketplace.
- Undoubtedly, the supermarket has played its part in wealth creation, but as an innovation it works in a rather different way from the simple linear model described before. But also, as supermarkets become ever more dominant in the retail scene, we see the negative side of this retail innovation. First, the supermarket has displaced other retail outlets on the high street and that imposes costs on those without cars (especially the elderly). Second, supermarkets are responsible for a substantial carbon footprint, because of the additional car journeys generated by this retail innovation.

SOME EFFECTS OF INNOVATION

- There are clearly some very important linkages from innovation to the environment.
- Some of these are **benign**. Innovative town planning has revived old industrial cities by making old warehouses and other industrial buildings into attractions in their own right.
 - This is apparent in the docklands of Liverpool, the centre of Manchester, and in the Lace Market district of Nottingham. Equally, innovative landscape gardeners have achieved the same effects as those described above, but in this case in city parks as opposed to private gardens.
 - We can also expect to find benign linkages from innovation to the environment in the form of clean technologies, or greater fuel efficiency and less noise from cars and aeroplanes.
- However, we have to recognise that there are potentially very many **negative** links from innovation to the environment. Some of these are obvious enough.
 - So, for example, in the industrial revolution, some factory innovations may have achieved greater productivity in the workplace, but they also created air pollution, water pollution and environmental pollution more generally.
 - Some of these effects are less obvious, however. Let us take one unexpected example. Since the mid-1980s, we have seen a long sequence of innovations in personal computer operating systems. We might imagine that this is a very clean innovation (it is software after all). But we are now starting to realise that these innovations may be responsible for a huge amount of e-waste. How can that be? The point is that each subsequent upgrade in the operating system requires a computer with more processing power and more memory. There comes a point when a computer that is perhaps only six to eight years old is obsolete in the sense that it cannot run current software, though it is still perfectly capable of running old software. Many environmentalists are deeply concerned about the growing trade in e-waste, products that still work but are obsolete in the sense described above, and which are shipped to third world countries to be dumped in landfill. In short, something that at first sight appears to be a clean innovation has some very adverse environmental side-effects.

SOME EFFECTS OF THE WORKPLACE

- The first simple model recognises that the success of a company depends on how that company succeeds in a marketplace. But there are other linkages from the workplace within the complex model.
- There can be a very important feedback from the character of the workplace to **creativity** and innovation within a company. Some enlightened companies have learnt this to their advantage and other less enlightened companies have learnt it to their cost.
- In pioneering work, Ekvall (1987, 1996) has developed the concept of a 'creative climate' and developed a technique for measuring the creative inclination of a workplace. This identified ten dimensions to creative climate and his questionnaire sought to measure these. This is very important, because some have argued that creative climate or creative culture is the single most important influence on the innovative potential of the company. Zaltman says:

“The daily environment provided by a firm is the single most important determinant of innovative thinking among its personnel. An effective intervention in that environment is far more productive than efforts to intervene in the individual manager’s thinking.”

SOME EFFECTS OF THE WORKPLACE

The character of the workplace can have obvious effects on the **consumption** behaviour of its employees.

Enlightened employers will be concerned with the health and welfare of their employees and may try to promote healthy consumption. Other less enlightened employers place their employees under so much stress that they eat and drink to excess. Some people who take on highly paid jobs complain that while they earn more their quality of life is no better.

One possibility is that busy people face a higher cost of living because, for example, instead of cooking meals for themselves they eat out in expensive restaurants. Another possibility is that the high salary comes at the expense of various forms of Ruskinian wealth – no quality time to spend with the family, for example.

SOME EFFECTS OF THE WORKPLACE

- The workplace can clearly have a direct impact on the **environment**. We have already commented on how the industrial revolution damaged the environment in which many lived and worked.
- But the effects need not be negative.
 - Tourists who have visited Port Sunlight on Merseyside will see what enlightened employers (Lever Brothers) could do for the environment in which their employees worked, and hence for their Ruskinian wealth.
 - The University of Nottingham has turned an old derelict industrial site (the old Raleigh bicycle factory) into a beautiful new campus, which is a very pleasant environment in which to work.
 - Moreover, just outside Nottingham there is the delightful Attenborough Nature Reserve. This used to be a collection of gravel pits, and not an especially attractive workplace perhaps, but it has now (with some imagination) been turned into a reserve with an exceptional diversity of wildlife. Indeed, it is arguable that the site would not be so special now had it not been an industrial site before

EFFECTS OF THE MARKETPLACE

For the economic **consumers**, the role of the marketplace is purely instrumental.

To them, it is a place in which they buy the goods which they will later consume. They take no particular pleasure in visiting the marketplace: indeed, ideally they would like the whole business of shopping to be done as quickly as possible.

But not everyone is like that.

Some people find the marketplace a source of pleasure even if they do not buy anything. This includes people who delight in spending hours looking around expensive designer shops and department stores, but it also includes people who delight in visiting much cheaper street markets or 'flea markets'. We could argue that for all these people, visiting the marketplace can create Ruskinian wealth, even if nothing is bought or consumed.

EFFECTS OF THE MARKETPLACE

More generally, we can see some sort of linkage from the marketplace to many other categories in our model.

There can also be an important feedback from the marketplace to **innovation** and the workplace. Those visiting the marketplace in a professional capacity can learn much about the state of the market and the nature of consumer demand that will be of value in guiding their innovation strategy and, perhaps, how the workplace is organised.

The marketplace can create a pleasant **environment** or have a less benign effect on the environment.

Examples of the former could be the magnificent market squares of some old market towns; examples of the latter have been discussed above in the context of supermarkets.

Finally, we note that the marketplace has been a source of inspiration and creativity for many centuries.

EFFECTS OF THE CONSUMER

The consumer is sovereign. Now, not all the consumers behave like sovereigns. But some do have a marked influence within the model.

The work of von Hippel (1988) has documented how influential the consumer can be in helping to guide companies' product innovation strategies. Indeed, innovation surveys, such as the Community Innovation Survey in the UK, have documented how contact with customers is one of the single most important sources of ideas for innovative firms.

- ❖ A well-known example of this is found in the business career of the great entrepreneur, Sir Branson. At an early stage in the history of his Virgin record stores he spent much time talking to teenagers about their record-buying behaviour and used what he learnt from these discussions to create a very successful chain of retail stores.
- ❖ Another well-known example is the phenomenon of 'texting'. Phone manufacturers and operators added this function to mobile phones as something of an afterthought. It was not expected that it would be widely used. But the unexpected consumption behaviour of teenagers, who used text messages far more than voice calls, demonstrated to phone companies that they must take the potential of the text very seriously.

EFFECTS OF THE CONSUMER

More recent work by von Hippel (2005) goes further than that, however. The customer is not just an invaluable source of information to the innovative company.

The customer may actually become the innovator.

As von Hippel says, users are increasingly able to innovate for themselves, and user-centred innovations have many advantages over manufacturer-centred innovations.

EFFECTS OF THE CONSUMER

Some consumption inevitably has an impact on the **environment**, sometimes positive, but often not.

Some of the onus for reducing the carbon footprint from economic activities lies with consumers.

We can insulate our homes, we can use public transport or bicycles rather than drive our cars, we can take holidays by train rather than using the plane, we can make sure not to leave our computers or video recorders on standby and we can do more recycling.

However, it is arguable producers have a greater responsibility for ensuring sustainability

EFFECTS OF WEALTH

Do you know the Veblen consumer?

Is someone so wealthy (in a material sense) that they wished to demonstrate that wealth by conspicuous consumption. Such very wealthy people have left their mark all over the simplistic linear model.

The wealthy may leave their mark on the landscape or environment more generally, by building and maintaining fine estates. Some go further and leave their estates to become the location of a university or other place of learning – and thus contribute to creativity and invention.

A famous example is the great Stanford University in California: this was founded by railroad magnate and California Governor Leland Stanford and his wife.

EFFECTS OF WEALTH

Wealth can contribute directly to **innovation**.

Some wealthy people, sometimes called business angels or serial entrepreneurs, have played a very important role in supporting the innovative efforts of startup companies.

We have discussed already the decision of enlightened employers to create a pleasant **workplace** for their workforce.

This is not just altruism. It is also based around an expectation that a pleasant working environment will help to attract and retain excellent staff who will repay this by making an exceptional contribution to the fortunes of the company.

EFFECTS OF THE ENVIRONMENT

- So many categories in the complex model could impact on the environment, and given the urgency of environmental concerns now facing us, the economist has to have a framework for understanding whether innovation can help the environment or, in fact, whether innovation makes things worse.
- However, the environment itself will have several other important effects within the complex model.
 - The most obvious, is the role of the environment in creating Ruskinian wealth. To those who take pleasure in walking in the countryside or visiting the seaside, this idea needs no explanation. Indeed, for some retired people who are still fit enough to do a lot of walking, this Ruskinian wealth may as important as any other source of wealth.
- The effects of the environment can be found in other places. Some of these have been discussed already.