



# **Creative Industry spillovers – understanding their impact on the wider economy**

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## **Creative Industry spillovers – understanding their impact on the wider economy**

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## Executive summary

The Creative Industries are defined as the following 13 industries - advertising, architecture, art and antiques, craft, design, designer fashion, film and video, interactive leisure software, music, performing arts, publishing, software, television and radio. A key aim of the DCMS is to “*increase the productivity of the creative industries, raise their profile, and support their development so that the UK can become the world's creative hub*”<sup>1</sup>.

DCMS is interested in understanding the links between the Creative Industries and the wider economy and the impact of these. Although there is evidence on the direct impact the Creative Industries make through Gross Value Added (GVA) and employment, little is understood on the wider impact of the Creative Industries. This has led DCMS to ask Frontier to consider the following questions:

- Are the Creative Industries creating spillovers, and if so, what type?
- Are the Creative Industries unique or different in the way they create spillovers from other sectors of the economy?
- What evidence is required to fully understand this?

We sought to answer these questions using the existing literature evidence on spillovers between the Creative Industries and the wider economy. However there was insufficient robust evidence to do this. Instead we have adopted the alternative approach of developing a robust economic framework. This allows us to understand how, in theory, spillovers could be generated and what you would need to do to test whether these occur in practice.

In developing our framework we have considered three standard types of spillover:

- knowledge spillovers – new ideas which benefit other firms without rewarding the firm creating them;
- product spillovers – new products which are used to benefit other firms without rewarding the firm producing them; and
- network spillovers – benefits which can only be generated when firms group together.

Our key finding is that a number of the Creative Industries may be unique in their ability to generate *network spillovers* through attracting other firms and workers. This will apply to firms that can make an area attractive. For example, firms in the performing arts may influence the image of a place they are located in to make it more appealing. This could lead to key workers moving into the area and higher levels of investment by firms in the wider economy. As Creative Industry firms may be uniquely able to make an area more attractive, this may be

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<sup>1</sup> [http://www.culture.gov.uk/about\\_us/creativeindustries/default.htm](http://www.culture.gov.uk/about_us/creativeindustries/default.htm)

an important issue for DCMS policy. The fact that the public sector interacts with the Creative Industries, for example through funding art galleries, more evidence on the role of the public sector is required to understand this more fully.

Our analysis also suggests that the Creative Industries may have the potential to generate knowledge and product spillovers. For example:

- *knowledge spillovers* may be generated by entrepreneurial fashion designers who set examples of how to translate new ideas into a successful business venture and so encourage other individuals to start their own business; and
- *product spillovers* may be generated by design firms whose ideas are valuable, easy to understand and to adapt by firms in other industries.

Whilst Creative Industry firms may not be unique in their ability to generate these spillovers, they may still be significant. This is an empirical question for which more evidence is required.

There is a lack of evidence on these issues. Our research is based on a literature review and conversations with industry experts. Whilst this has enabled a set of hypotheses on the types of spillovers the Creative Industries may generate, going forward there is a need to develop a robust and reliable evidence source for the Creative Industries on spillovers. A research programme which draws on a combination of evidence sources would be required to do this. This would include firm level survey data and case studies for assessing inter-sectoral knowledge and product spillovers. A separate survey and case studies on understanding firms' location decisions over time, would be required for understanding agglomeration and attractiveness factors associate with the Creative Industries.

# 1 Introduction

DCMS defines the Creative Industries as the following 13 industries - advertising, architecture, art and antiques, craft, design, designer fashion, film and video, interactive leisure software, music, performing arts, publishing, software, television and radio. Collectively the Creative Industries form an important part of the UK economy, representing 7% of total UK Gross Value Added in 2004<sup>2</sup>. In 2005, the Creative Industries employed 1.8 million people directly and indirectly – a growth of 16% since 1997<sup>3</sup>.

Little is known about the impact of the Creative Industries on the wider economy, particularly their impact on other firms<sup>4</sup>. Frontier has been asked by DCMS to examine the spillovers the Creative Industries generate to firms in the wider economy. In particular we have been asked to consider:

- how these creative spillovers could be generated;
- the nature of the benefits they could bring to firms in the wider economy;
- whether there is anything unique or different about these; and
- how a robust evidence base could be established to further our understanding.

## 1.1 OUR APPROACH

This study aims to improve our understanding of Creative Industry spillovers. In order to do this we have attempted to address the following set of questions:

- What is an economic spillover?
- How could these spillovers be generated by the Creative Industries?
- Is there evidence that supports the existence of spillovers in the Creative Industries?
- Is it likely that some Creative Industries are more likely to generate spillovers than others?
- Is there something different or unique about Creative Industry spillovers, compared to spillovers generated by firms in the wider economy?

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<sup>2</sup> This is the latest available statistic and excludes the crafts as data was not available. Source: DCMS, Creative Industries Economic Estimates Statistical Bulletin, September 2006. Available from <http://www.culture.gov.uk/NR/rdonlyres/70156235-8AB8-48F9-B15B-78A326A8BFC4/0/CreativeIndustriesEconomicEstimates2006.pdf>

<sup>3</sup> Source: Table 3, DCMS, Creative Industries Economic Estimates Statistical Bulletin, September 2006. Available from <http://www.culture.gov.uk/NR/rdonlyres/70156235-8AB8-48F9-B15B-78A326A8BFC4/0/CreativeIndustriesEconomicEstimates2006.pdf>

<sup>4</sup> The Creative Industries also generate benefits to individuals. There is already a significant amount of evidence to support this (see Annexe 3).

- What evidence is required to further understand Creative Industry spillovers?

In terms of the evidence used to answer these questions we have conducted an in-depth review of the literature. In addition we have held discussions with experts from the Creative Industries. Unfortunately we found no robust evidence on the literature for spillovers from the Creative Industries to other firms. Our approach therefore has focused on establishing an analytical framework for understanding how Creative Industry spillovers might occur. This is based on evidence from the wider economic literature. To assess whether these spillovers may occur in practice, we road tested a series of propositions with Government and a number of industry experts.

Lack of evidence in the literature and project constraints mean that we have not been able to generate a sufficiently robust evidence base to answer these questions fully. The key output of our analysis is a series of testable propositions on the types of spillover that could be generated and which industries are most likely to generate these. Further more in-depth research would be required to confirm whether any of these occur in practice.

The remainder of the report is structured in line with the key questions listed above:

- Section 2 considers what we mean by the term economic spillover. It then discusses the relevance of this framework for the Creative Industries.
- Section 3 examines whether certain firms in the Creative Industries are more likely than others to generate these spillovers.
- Section 4 considers whether there is anything different or unique about creative firms' ability to generate these spillovers.

## 2 Economic spillovers

Economic spillovers are often referred to as externalities in the literature. Marshall (1920) was the first to formally analyse the externality problem, referring to externalities as being “*external to the firm but internal to the industry*”<sup>5</sup>.

In this study we are focussing on positive externalities (spillovers). This is the case when a firm’s production of its goods not only has a reward for the firm, but it can also bring rewards or benefits to other firms in the wider economy. The classical problem of spillovers is that the firm is not adequately rewarded for all the benefits it creates for other firms in the economy. This leads the firm to produce less than is beneficial for the economy as a whole. In other words, spillovers lead to market failures. A more in-depth discussion on assessing the extent to which a spillover can cause a market failure is contained in Annexe 2. We illustrate the positive externality (or spillover) problem below for the fashion design industry.

### **SPILOVERS FROM THE DESIGNER FASHION INDUSTRY**

We consider a fashion designer who has created a new process for weaving fabrics. This new process enables fabrics to be twice as strong as those currently available. This is particularly valuable to the fashion designer as this allows it to charge a higher price for its goods and make higher profits.

The new weaving process is also valuable to firms in other industries, such as industrial textiles. Once these firms learn about the new process they acquire this new knowledge through reverse engineering. This also enables them to weave stronger fabrics, charge higher prices and make higher profits. Reverse engineering has meant that the fashion designer was unable to charge a price to these firms for using its new idea. The fashion designer therefore does not internalise other firms’ use of its new idea into its production decisions. This is an example of a positive spillover.

The existence of this positive spillovers leads to a problem. The designer fashion firm has many other ideas as to how fabrics can be woven differently. Although these are not valuable to this firm, as before they are potentially highly valuable to other firms in the wider economy. A problem exists because the designer has no incentive to develop these new ideas. Unless the firm can charge these other firms for using its ideas, the designer will continue to under-provide these new ideas.

We are also focusing on benefits to firms outside of the Creative Industries. This narrows our focus to considering spillovers which benefit firms in a different industry to the one of the firm generating the benefit. This is discussed in more detail below.

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<sup>5</sup> Marshall, A., Principles of Economics, London: Macmillan and Co., Ltd., 1920. Eighth edition

## 2.1 UNDERSTANDING HOW SPILLOVERS ARE GENERATED

Our analysis is founded on the economic literature on R&D spillovers. A key paper on the mechanism of spillovers is Jaffe (1996)<sup>6</sup>. This identifies three kinds of spillover which may be relevant to the Creative Industries<sup>7</sup>:

- knowledge spillovers – new ideas which benefit other firms without rewarding the firm creating them;
- product spillovers – new products which are used to benefit other firms without rewarding the firm producing them; and
- network spillovers – benefits which firms can only obtain by grouping together.

These are represented in Figure 1 below.

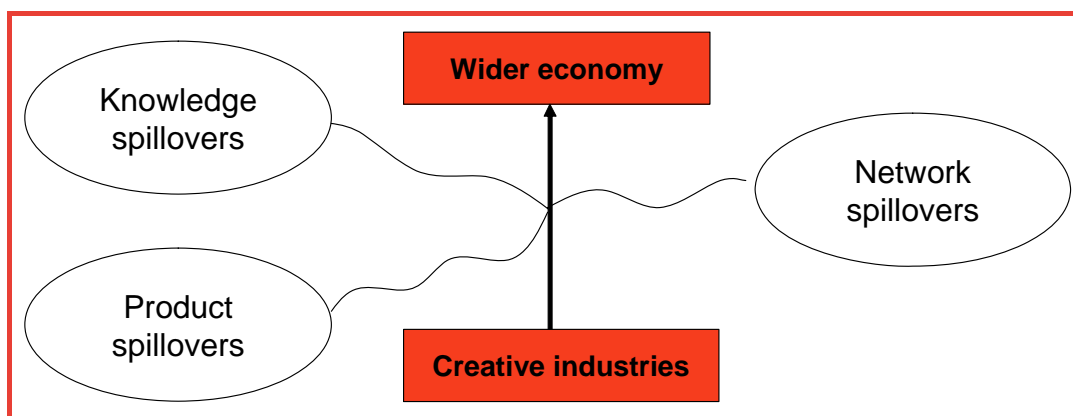


Figure 1: Creative Industry spillovers to the wider economy

Source: Jaffe (1996) and Frontier

## 2.2 KNOWLEDGE SPILLOVERS

Jaffe (1996) makes an important distinction between two forms of knowledge spillover:

- intra-market spillovers; and
- inter-market spillovers.

The difference between these two types of spillover is illustrated below in Figure 2.

<sup>6</sup> Jaffe, A.B. (1996). Economic analysis of research spillovers implications for the advanced technology program. <sup>6</sup>

<sup>7</sup> Jaffe (1996) describes a wide range of spillovers. We have excluded market spillovers from our analysis because this relates to the benefits consumers may derive. We have also sub-divided Jaffe's term knowledge spillover into two categories – knowledge and product spillovers. This is helpful because the mechanism by which these are generated are different.

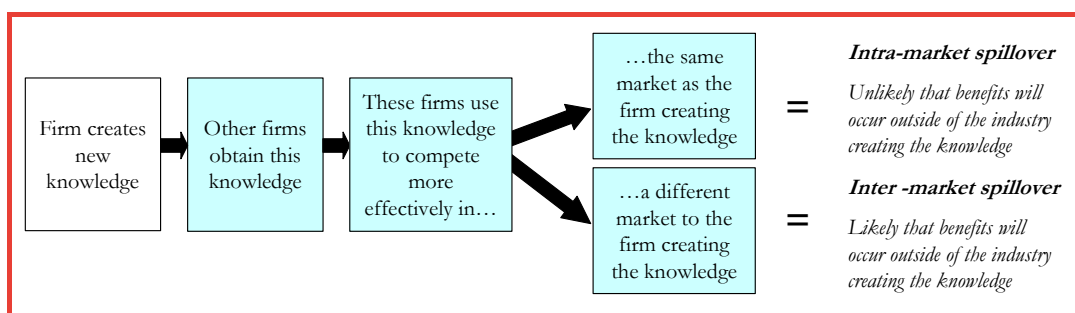


Figure 2: Illustrating the difference between intra and inter market spillovers

Source: Frontier

As Figure 2 demonstrates, intra-market spillovers can only benefit firms within the same product market. This implies that these are unlikely to be relevant to this study. For example, EMI could only potentially benefit other music firms or firms linked to the music market. In contrast, inter-market spillovers benefit firms in different markets to the firm producing the benefit. In this case, a firm in the music industry such as EMI could potentially generate an inter-market spillover to benefit firms in the aerospace or food industry.

To further understand the spillover benefits the Creative Industries may generate to the wider economy, we therefore focus our study on inter-market spillovers. Annexe 1 and 2 discuss intra-market spillovers in more detail and how to assess the market failures that result from both types of spillover.

### 2.2.1 Inter-market knowledge spillovers

Jaffe's framework of economic spillovers can be adapted to understand how inter-market knowledge spillovers occur and the consequence of these spillovers. The inter-market spillover process illustrated in Figure 3 below can be described as follows.

- The first box (bottom left) in Figure 3 considers a firm which engages in research for new ideas.
- This new idea exists initially as knowledge (represented by the next box in the diagram). This may be written down (codified knowledge), embodied in prototype products (codified knowledge) or simply contained in the minds of the people who have been working on the project (tacit knowledge)<sup>8</sup>. This

<sup>8</sup> Knowledge may exist in one of two forms: codified knowledge; and tacit knowledge. The difference between these two factors is the method by which this knowledge can be effectively transferred. Codified knowledge can be effectively transferred in written form or another physical form such as a product. This means that it is relatively easy to transfer over large distances and between people who may never have met. Tacit knowledge differs in that it cannot be easily described in written or another physical form. Instead it can only be fully understood by demonstration, which may have to be repeated several times. This means that tacit knowledge can only generally be transferred over short distances – for example through face to face meetings. A classic example of tacit knowledge is knowing how to swim or to dance.

knowledge may be valuable to firms in other product markets. These firms can adapt this idea to compete more effectively in their own product market.

- An inter-market knowledge spillover (the red arrow in Figure 3) occurs if firms in other markets acquire this new knowledge without rewarding the firm which created this knowledge. This may arise through employees leaving to work for firms in other sectors (tacit knowledge transfer), or from employees of firms in other sectors reading about these ideas in a journal or trade article (codified knowledge transfer).

The outcome of the knowledge spillover is illustrated by the final row of boxes in Figure 3. The firm which created the knowledge makes an increased profit from its new idea. This occurs because firms can charge a higher price to their consumers or sell more of their product.

- Firms in other markets can also increase their profits. This occurs because they can raise their price in their product market.
- Consumers may derive spillover benefits from better quality goods or higher quality products<sup>9</sup>.

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<sup>9</sup> Although these benefits are not the focus of our study, it is worth noting that these will only exist if consumers do not pay a price equal to their full willingness to pay for a good – economists refer to this as consumer surplus.

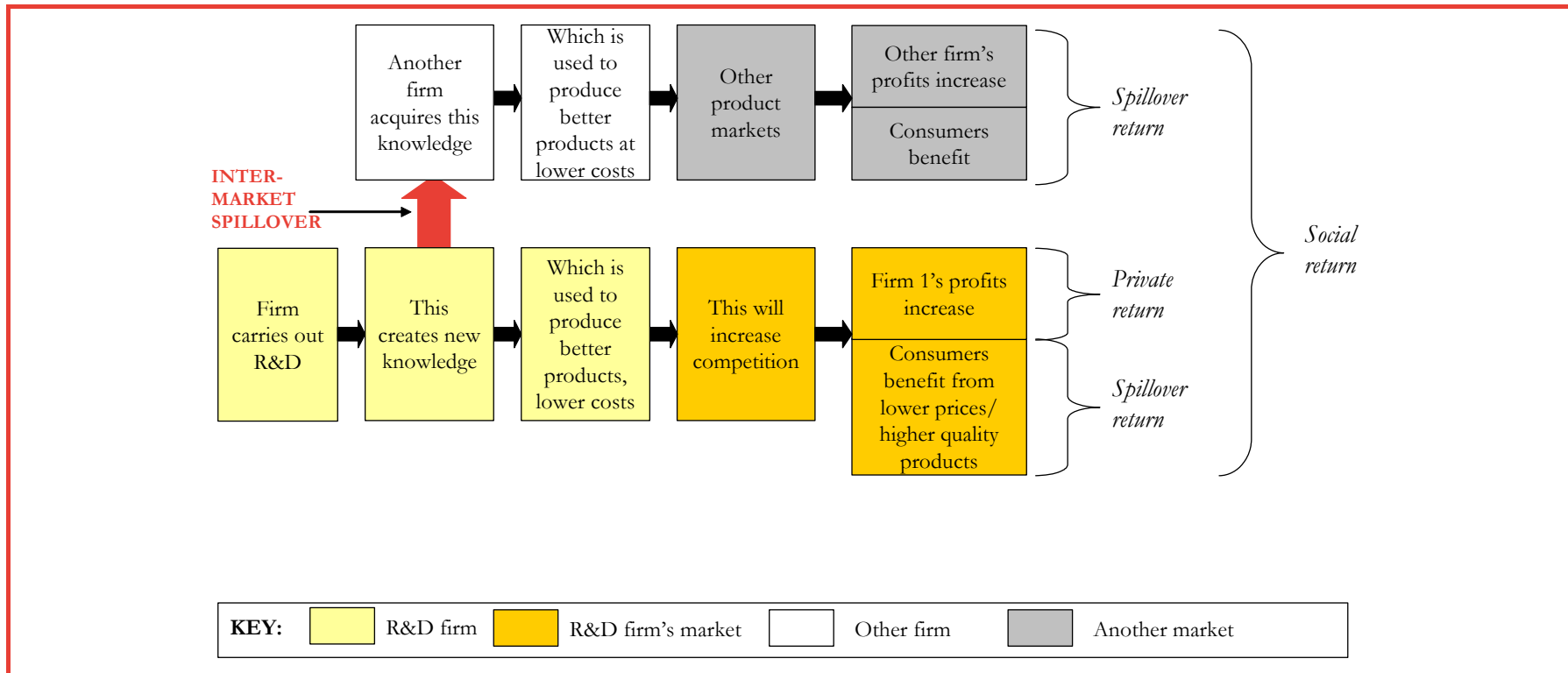


Figure 3: Inter-market knowledge spillovers

Source: Jaffe (1996) and Frontier

### *The problem with inter-market spillovers*

The problem with inter-market spillovers is that the firm creating the knowledge is not rewarded for the benefits it provides to firms in other markets. As a result the firm under-invests in knowledge creation and supplies a sub-optimal level of innovation to society. In other words, inter-market knowledge spillovers lead to a market failure.

This is illustrated in Figure 3 above where the firm's private return/ profit is less than the total social return (the sum of all firms' profits and consumer surplus). This gap between the private return and the social return is referred to as the spillover gap. The size of this can be used to measure the extent of the market failure. This is discussed in more detail in Annexe 2.

## 2.3 PRODUCT SPILLOVERS

Product spillovers are similar to knowledge spillovers. As before, product spillovers can occur as:

- intra-market spillovers; and
- inter-market spillovers.

Again, the distinction between these is important. Intra-market spillovers can only benefit firms within the same product market, whereas inter-market spillovers can benefit firms in different markets. This implies that inter-market spillovers will be most relevant to understanding how spillover benefits are generated by firms in the Creative Industries to firms in the wider economy. Again, this study focuses on inter-market spillovers to understand how product spillovers could be generated. More detail on intra-market product spillovers and assessing the market failures that result from intra and inter-market spillovers is provided in Annexe 1 and Annexe 2.

Because product spillovers are very similar to knowledge spillovers we provide a brief description of inter-market spillovers below. This highlights why product and knowledge inter-market spillovers are different.

### 2.3.1 Inter-market product spillovers

Jaffe's framework of economic spillovers can be adapted to understand how inter-market product spillovers can occur and the consequence of these spillovers. As discussed above, firms in the Creative Industries are most likely to generate product spillovers to firms in the wider economy through inter-market rather than intra-market spillovers.

The inter-market product spillover process, which is illustrated below in Figure 4, can be described as follows.

- The first box (bottom left) in Figure 4 considers a firm which engages in research for new ideas.
- This new idea exists initially as knowledge (represented by the next box in the diagram).

- The firm then embodies the new knowledge in a new or improved product (an example of codified knowledge)<sup>10</sup> and places this on the market (shown in the next box in Figure 4). This knowledge is valuable to its rival firms as it will allow them to compete more effectively in the market.
- An intra-market product spillover (the red arrow in Figure 4) occurs if firms in other markets acquire this new knowledge without rewarding the firm which created it. Firms can do this by reverse engineering the new product once it is on the market and using this knowledge to improve their products.

The outcome of the knowledge spillover is illustrated by the final row of boxes in Figure 4.

- The firm which created the knowledge makes an increased profit from its new idea. This occurs because firms can charge a higher price to their consumers or sell more of their product.
- Firms in other markets can also increase their profits. This occurs because they can raise their price in their product market.
- Consumers may derive spillover benefits from better quality goods or higher quality products<sup>11</sup>.

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<sup>10</sup> Knowledge may exist in one of two forms: codified knowledge; and tacit knowledge. The difference between these two factors is the method by which this knowledge can be effectively transferred. Codified knowledge can be effectively transferred in written form or another physical form such as a product. This means that it is relatively easy to transfer over large distances and between people who may never have met. Tacit knowledge differs in that it cannot be easily described in written or another physical form. Instead it can only be fully understood by demonstration, which may have to be repeated several times. This means that tacit knowledge can only generally be transferred over short distances – for example through face to face meetings. A classic example of tacit knowledge is knowing how to swim or to dance.

<sup>11</sup> Although these benefits are not the focus of our study, it is worth noting that these will only exist if consumers do not pay a price equal to their full willingness to pay for a good – economists refer to this as consumer surplus.

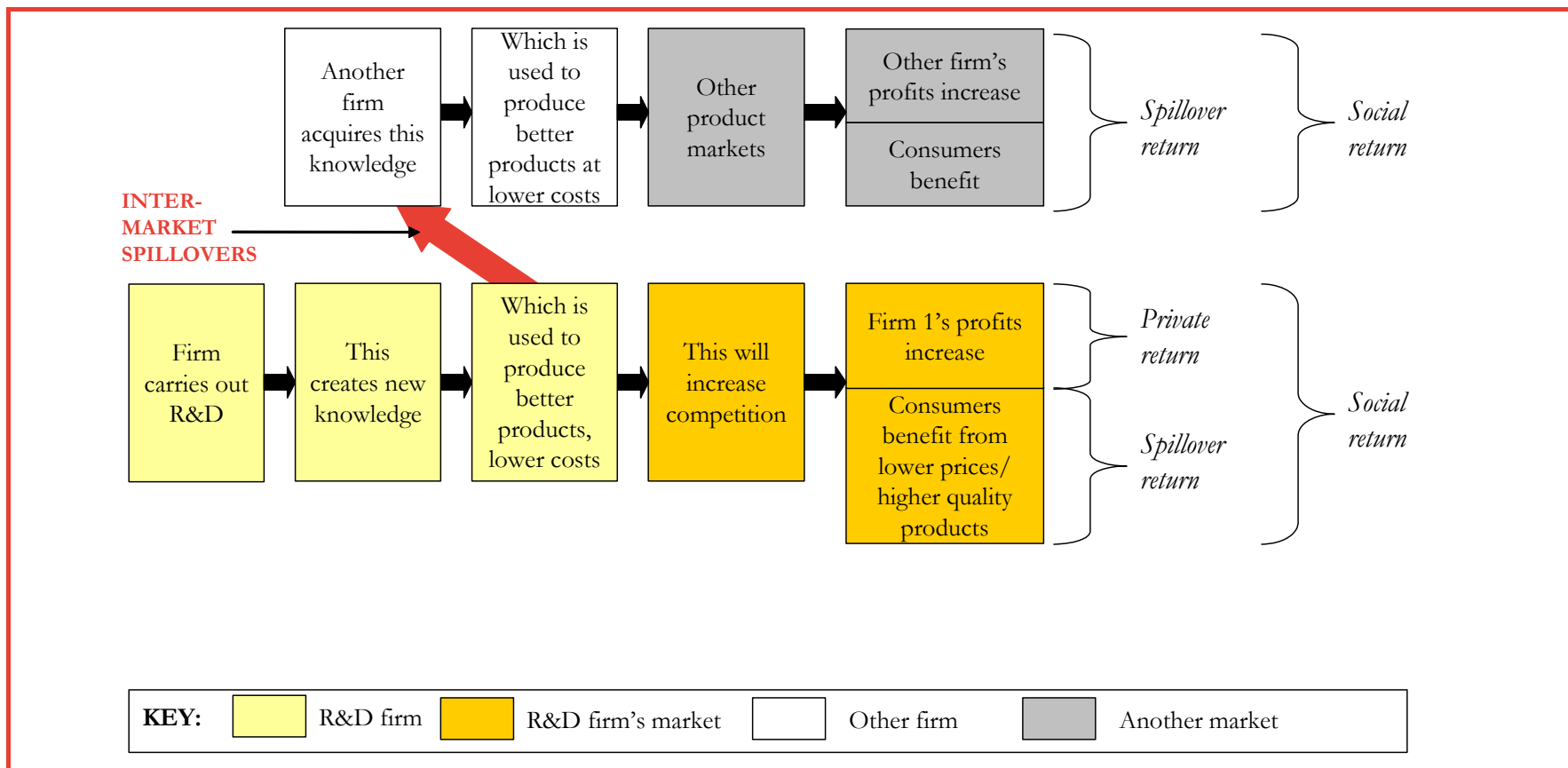


Figure 4: Inter-market product spillovers

Source: Jaffe (1996) and Frontier

### *The problem with inter-market spillovers*

The problem with inter-market product spillovers is identical to the problem we discussed for inter-market knowledge spillovers. That is, the firm creating the knowledge is not rewarded for the benefits it provides to firms in other markets. As a result the firm under-invests in knowledge creation and produces a sub-optimal level of new ideas to society (a market failure).

This is illustrated in Figure 4 above where the firm's private return, or profit, is less than the total social return (the sum of all firms' profits and consumer surplus). This gap between the private return and the social return is referred to as the spillover gap. The size of this can be used to measure the extent of the market failure. This is discussed in more depth in Annexe 2.

## 2.4 NETWORK SPILLOVERS

The definition of agglomeration spillovers and cluster spillovers is often confused. As **Error! Reference source not found.** demonstrates, these should be considered separately.

### 2.4.1 Agglomeration spillovers

The spillover process for agglomeration spillovers is illustrated in **Error! Reference source not found.** below. This occurs in the following way:

- A firm (shown in the top left hand box) chooses where to locate. Other firms also locate close to this firm. The reason these firms choose to locate together may be a common supply or customer base. These firms do not necessarily interact with each other.
- This leads to two potential agglomeration spillovers (indicated by the red arrows in **Error! Reference source not found.**):
  - a place may become more attractive because individuals value easy access to these firms. This may cause them to locate their home or workplace nearby; and
  - a place may also become more attractive because the concentration of firms alters its image.
- As a result other firms benefit from being able to attract customers, suppliers or employees more readily. A spillover results because firms may be able to attract highly valuable workers which they might otherwise be unable to attract if their location were less attractive.

The economic impact of these agglomeration spillovers depends upon a number of issues.

- The first of these relates to the initial location of the firms or individuals that relocate in order to be close to the Creative Industries. If these firms or individuals were originally located outside of the UK, the net effect on the UK economy is likely to be positive (assuming the relocating units are productive). However, if these firms or individuals were already located

within the UK, then the net effect on the UK economy may be zero, as productive units have simply been displaced from one region to another.

- The second issue relates to whether, by relocating, these firms or individuals become more productive. This would mean that even firms that relocate within the UK may have a net positive impact on the UK economy. Although there is little evidence it is possible that Creative Industries may attract a unique cluster of individuals or firms which would not otherwise have formed. If the interactions between this unique cluster lead to increases in productivity then it can be said that Creative Industry agglomerations may also lead to indirect spillover benefits.

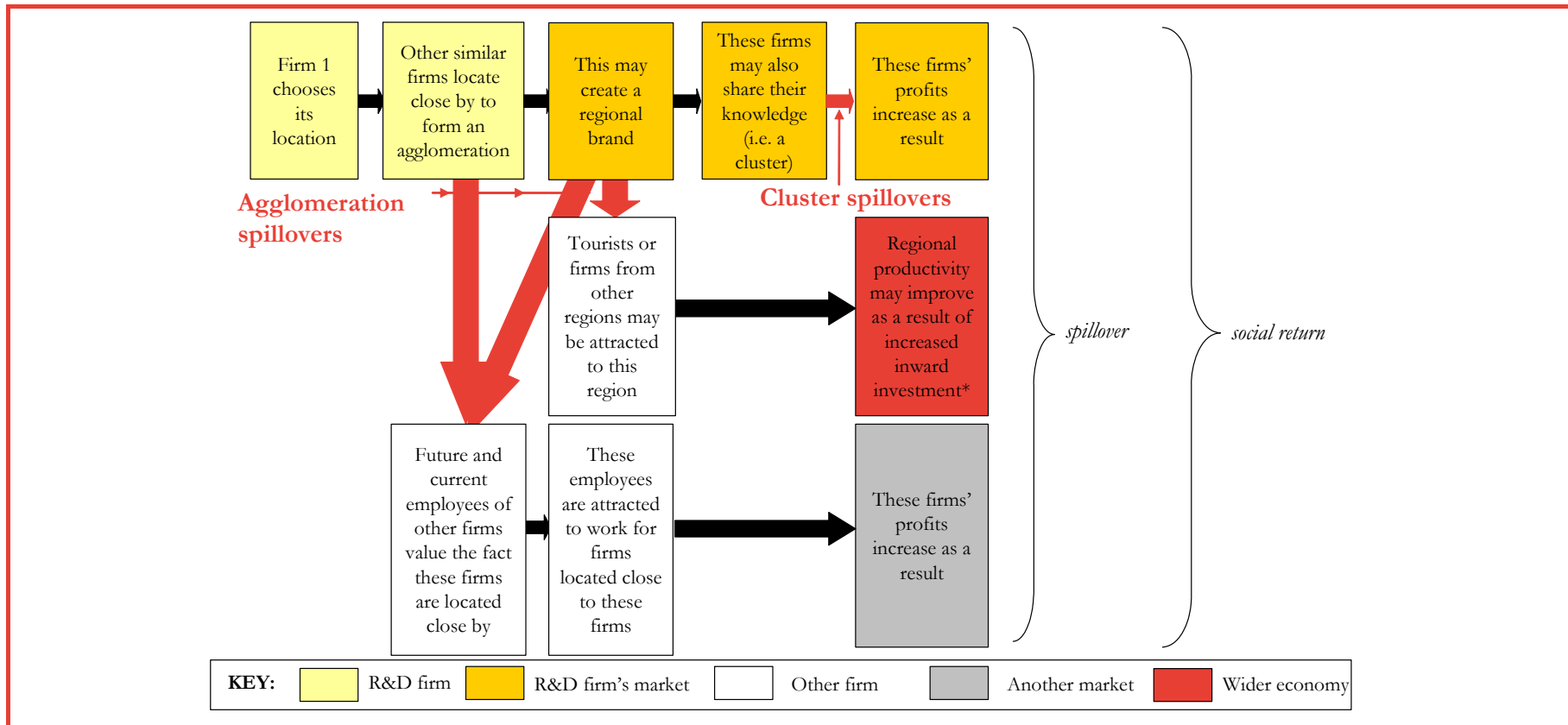


Figure 5: Network spillovers

Source: Frontier

\* Note: In the case of tourism it is not clear that regional productivity would necessarily improve

## 2.4.2 Cluster spillovers

Clusters are defined by Porter (1998) as *"a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities."*<sup>12</sup>

The process for generating these spillovers (illustrated in **Error! Reference source not found.** above) is as follows:

- We consider a firm which chooses to locate in a place (represented by the top left hand box in **Error! Reference source not found.** above).
- Other firms locate close to this firm. In the first instance these firms may simply be customers or suppliers. But eventually these firms start to interact and share knowledge.
- These firms generate a cluster spillover:
  - each firm benefits from sharing its ideas with other firms. Overall the firms are better off than if they had developed their ideas individually.
- The cluster spillover is the additional benefit the firms in the cluster receive.

## 2.5 SPILLOVERS AND THE CREATIVE INDUSTRIES

This section has focused on understanding what spillovers are and how they may be generated. Our framework has identified a number of spillover categories:

- knowledge spillovers - intra-market and inter-market;
- product spillovers - intra-market and inter-market; and
- network spillovers - agglomerations and clusters.

Our analysis suggests the following.

- For knowledge and product spillovers we need to focus on inter-market spillovers:
  - inter-market spillovers are benefits which are received by firms operating in a market which is different to the market of the firm generating the spillover benefit – e.g., a firm in the film industry may attract additional tourists to an area, generating a spillover benefit to the other firms in the tourism industry/ the wider economy; whereas
  - intra-market spillovers are benefits which are received by firms operating in the same market as the firm generating the spillover benefit – e.g., a games software producer may replicate the idea of another software producer without paying the other firm adequate compensation.
- For network spillovers, we should focus on agglomeration network spillovers rather than cluster spillovers:

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<sup>12</sup> Porter, M. E., (1998). "Michael Porter on Competition", Boston: Harvard Business Review.

- agglomeration spillovers are benefits which other firms receive when they locate close to a group of firms. These could include a group of creative firms forming a regional brand which attracts highly skilled individuals, firms or tourists. This could include a firm in the wider economy.
- cluster spillovers are the product of closely located firms interacting on a regular informal basis. These interactions give rise to a series of benefits to the firms within the cluster. It seems unlikely that creative firms would cluster and interact with firms in the wider economy. Firms tend to interact when they share a common focus. This could include a common customer base or technology. This suggests that clusters are generally formed from firms which share a supply chain or operate in the same industry.

The next section applies our framework to describe how in practice spillovers are generated by the Creative Industries to the wider economy.



## 3 The evidence on Creative Industry spillovers

In this chapter we focus on understanding the types of spillover the Creative Industries may generate and which particular industries are most likely to be generating these. This section aims to address these issues by taking each spillover in turn and asking:

- Does the evidence support the existence of these types of spillover?
- Does it suggest that some Creative Industries more likely to generate spillovers than others?

As already discussed, there is little existing evidence on spillovers from the Creative Industries to the wider economy. As a result, we have discussed these questions with Government and Creative Industry experts. This has allowed us to test our analysis in the context of the Creative Industries. In addition the discussions have led to suggestions of what kinds of spillover may be generated by different Creative Industries.

### 3.1 DOES THE EVIDENCE SUPPORT KNOWLEDGE SPILLOVERS?

Our analysis suggests that knowledge spillovers may occur in three ways:

- organisational knowledge spillovers;
- innovation knowledge spillovers; and
- entrepreneurial knowledge spillovers.

We discuss these in the context of the Creative Industries and our discussions with Government and Creative Industry experts.

#### 3.1.1 Organisational knowledge spillovers

Creative Industries may organise themselves differently. This may be through a flat hierarchy, making decisions differently, or offering employees a more appealing work environment. These ideas can spillover to the wider economy through employees leaving the Creative Industries or from other firms observing these practices. The evidence suggests that the Creative Industries do organise themselves differently. However there is no evidence on whether these practices would be beneficial for firms in the wider economy.

Creative Industry firms tend to organise their work practices around a particular project and employ people through short term contracts. Working days tends to be long and unpredictable. These working practices may be appealing to creative individuals who value flexibility however the evidence suggests that people who leave these firms do so because of their dis-satisfaction with this. A games software firm we spoke to gave the example of one of its employees leaving the

firm to work in the wider economy because this allowed him shorter, more regular hours and greater job stability.

There is a view that firms in the Creative Industries tend to be small (and stay small) because they lack the organisational skills to grow their business from the start-up phase<sup>13</sup>. This implies that it is unlikely that the wider economy would benefit from business organisation spillovers. However, our conversations with the creative industries – for example, designer fashion - suggest that whilst this argument may be valid for some firms, there are examples of where this may not apply.

It may be the case that the innovative nature of some creative firms means they operate best when they are small. For example, the designer fashion industry operates in a niche market. This often requires its suppliers to be able to provide bespoke products. Whereas these products could be manufactured on a greater scale at a lower cost in other countries such as China, this is unlikely to fit the requirements of the industry. The fashion industry may not require, or even want its materials to be made available on the mass market. In addition, frequent face-to-face interactions between a firm and its supplier are also important to get the product right. More evidence based research is required to understand the extent to which Creative Industry business skills may be able to benefit firms in the wider economy.

### 3.1.2 Innovation knowledge spillovers

Creative firms may be able to pass on a culture of innovation to firms in the wider economy. However, although firms in the Creative Industries may be more innovative, as with entrepreneurship (discussed above) there is limited evidence to suggest that this culture of innovation is being transferred to firms in the wider economy.

The Arts and Humanities Research Council is engaged in maximising the links between innovative creative firms and the firms in the wider economy. This includes a program of collaboration with other Research Councils to encourage the transfer of ideas between industries. This suggests that some spillovers may be occurring. Again, more research is required.

### 3.1.3 Entrepreneurial knowledge spillovers

Some sectors of the Creative Industries are characterised by a relatively large number of small firms and sole traders. This characteristic could be the result of one of two factors:

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<sup>13</sup> For example, see the DCMS Working Group report on Business Support and Access to Finance (published November 2006). This is related to the skills and ambitions for growth in many creative businesses. There is a clear case for public intervention to support the development of stronger awareness of, and skills for, commercial growth within the creative industries, to ensure that the management teams within creative businesses are better able to plan for and manage growth and to understand the priorities of private investors. ([http://headshift.com/dcms/mt/archives/blog\\_36/Access%20to%20Finance%20and%20Business%20Support%20-%20final%20report%202nd%20November%202006%20%282%29.doc](http://headshift.com/dcms/mt/archives/blog_36/Access%20to%20Finance%20and%20Business%20Support%20-%20final%20report%202nd%20November%202006%20%282%29.doc)).

- either that the rate of new business creation (entrepreneurship) is higher than other sectors in the wider economy; or that
- small firms in the Creative Industries experience problems in growing their business further.

If the first of these factors is driving the large number of small firms and sole traders, this suggests that the Creative Industries may be able to set an example and so inspire other firms to be entrepreneurial.

To test this hypothesis we have considered the rate of business start-ups in the Creative Industries. Information on business start-ups - although only part of the story on successful entrepreneurship – is widely available and the most widely used proxy of entrepreneurship<sup>14</sup>. Qualitative evidence from the road tests suggests the Creative Industries are characterised by a relatively high number of small firm start-ups.

This high level of start-up activity suggests that the Creative Industries may be more entrepreneurial than those in the wider economy. The road tests have suggested two key reasons as to why this may be the case.

- The first hypothesis is that entrepreneurs in the Creative Industries tend to move on to another business start-up venture once their current idea has been established. This differs from the wider economy where a new idea is more likely to be incorporated into an existing business rather than providing the rationale for setting up an entirely new business.
- Another more fundamental reason is that the business model of firms at the creative end of the Creative Industries is focused on the constant generation of ideas and change. The views of many of the people we spoke to during the road tests were that this was linked to a less risk adverse mentality. This lower risk adversity was leading to higher levels of entrepreneurship.

Entrepreneurial success in any industry can be inspiring. Household names such as Richard Branson (Virgin) and Anita Roddick (the Body Shop) are synonymous with entrepreneurship. More recent successes include many names from the Creative Industries such as Linda Bennett (LK Bennett (fashion)) and the current Ernst and Young UK entrepreneur of the year, Timothy Richards (Vue Entertainment Holdings Ltd. (film))<sup>15</sup>. It seems unlikely that entrepreneurs' ability to inspire is restricted to individuals and firms within their industries. This implies that there is potential for significant entrepreneurial spillovers between

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<sup>14</sup> Entrepreneurship is considered by HM Treasury as one of the five key drivers of economic growth. In its 2002 report, 'Enterprise Britain: a modern approach to meeting the enterprise challenge', business start-up rates between the UK and other world economies are compared to illustrate the lag in entrepreneurship performance. Source: <http://www.hm-treasury.gov.uk./media/B8D/88/adentbrit02part1-373kb.pdf>

<sup>15</sup> Richards left a lucrative job with one of the world's largest international cinema operators in the US, opting to go it alone and develop and operate a new chain of cinemas internationally, believing he could take advantage of digital technology to provide a higher quality, dynamic product whilst reducing costs. Vue Entertainment was subsequently founded in 1998. The first cinema opened in Livingston, Scotland in 2000 and there are now 53 cinemas across the UK.

the Creative Industries and the wider economy. A further idea raised during our discussions with Creative Industry experts is that the products created by Creative Industry entrepreneurs may attract more attention than the output of say an engineering or mining firm.

In terms of evidence, these hypotheses rely on information from our discussions with industry experts. This information suggests that many creative firms can be considered as highly entrepreneurial. There is less evidence to support the fact that this generates spillovers to the wider economy. More research is required on the link between start-ups in the Creative Industries and start-ups in the wider economy. In addition, we have not been able to examine whether small creative firms' ability to grow their business to become a small or medium sized business could also be factor. This should also be explored through further research.

### **3.2 DOES THE EVIDENCE SUPPORT PRODUCT SPILLOVERS?**

Although there is significant evidence in the literature to support product spillovers these tend to focus on spillovers which occur between firms competing in the same product market. The views expressed during our road tests support two ways in which these spillovers may occur:

- complementary product spillovers; and
- differentiated product spillovers.

#### **3.2.1 Complementary product spillovers**

Firms in the Creative Industries may be able to generate complementary product spillovers by increasing demand for products in other industries.

It is unlikely that Creative Industry firms are unique in their ability to generate these spillovers. For example, the electronics industry generates spillovers by creating demand for batteries to power its portable products, similarly the motor industry generates spillovers by creating demand for in-car entertainment systems and protective clothing for motor bikes.

The box below provides an example of this which emerged from our conversations with the music industry.

## **iPOD SPILLOVERS – EVIDENCE FROM THE MUSIC AND DESIGN INDUSTRY**

The iPod – Apple’s portable media player was launched in October 2003. Demand for this product has been phenomenal. In 2005, Apple sold 32 million iPods, which equates to one iPod being sold every second\*. This high demand has generated a huge expansion in the demand for the products which complement the iPod. The Apple’s marketing efforts with the iPod can be said to be generating spillovers to complementary good producers, provided Apple does not receive a return (such as a licence payment) from them.

The key complementary product for the iPod is pre-recorded music stored in a digital format. Demand for the iPod has led to a surge in demand for this – for example Coldplay’s single - ‘the Speed of Sound’ – became the billionth tune to be downloaded via iTunes in February 2006. It is commonly believed that the iPod has made pre-recorded music more accessible. As a result, the market the pre-recorded music has expanded. A spillover is generated as a direct result of this from Apple to the recording artists who will receive more royalties (assuming the royalty rate remains the same between formats).

As well as creating product spillovers to firms in the music industry, the success of the iPod has created spillovers to firms outside the Creative Industries. There are a large number of firms which manufacture accessories for the iPod. Some of these are officially licensed iPod accessory manufacturers such as JBL and Monster Cable (an audio visual electronics firm) as well as several other non-licensed accessory manufacturers such as the Chinese materials firm, the Shenzhen Diya Silicon Gel Product Factory which manufactures cases for the iPod. In all of these cases, these firms are able to sell significant quantities of their products simply by relying on Apple’s successful marketing of the iPod. In the case of the non-licensed products, Apple is not rewarded by these other firms for its efforts. This gives rise to a complementary product spillover from Apple to firms in the wider economy, such as the Shenzhen Diya Silicon Gel Product Factory.

\* Source: New York Times, 3 February 2006.

<http://www.nytimes.com/2006/02/03/technology/03ipod.html?ex=1296622800&en=91f4e87dd848693f&ci=5088>

### **3.2.2 Differentiated product spillovers**

The Creative Industries may be more able to produce differentiated product spillovers than other firms. These could be generated when firms outside the Creative Industries adapt the product of a creative firm to sell more products in their industry.

Our road test discussions provided evidence for these spillovers. The box below provides an example from the fashion and the design industry.

## FASHION AND DESIGN PRODUCT SPILLOVERS

The designer fashion industry is founded on the constant creation of new ideas. It is widely accepted that whilst these ideas are not replicated by other firms, high street fashion retailers such as Top Shop and H&M are heavily influenced by its output. This influence can be considered a spillover between the designer fashion industry and the wider economy (high street fashion retail). Unlike traditional industries such as aerospace and pharmaceuticals, this spillover does not create problems for fashion designers such as Stella McCartney and Tom Ford. One reason is that the spillover does not lead to direct replication. This may be explained in the following ways:

- replication may be considered the antithesis of designer fashion;
- ideas are easy to adapt so there is no need to replicate; and
- fashion designers use their designs to market their brand.

This final point was emphasised by the designer fashion industry in our road test discussions. Fashion designers create new clothing ideas to strengthen their brand image. They do this by setting high prices to restrict volumes, rather than to maximise profits. This ensures that clothes such as a Stella McCartney cardigan priced at £375 remain a dream or aspiration product. The dream translates into a strong brand image which is used to sell profitable accessories such as watches and handbags. In effect this is a two-way spillover:

- high street retailers benefit from new design ideas; and
- fashion designers benefit from free marketing.

It follows that this symbiosis does not carry over to the accessories market where fashion designers make their profits.

Design spillovers to the wider economy may also be prevalent. As we saw above for the iPod, the output of the design industry is often intertwined with that of other industries. For example, British Airways employed UK design consultancy Tangerine to design the first flat-bed for commercial air travel. This new design was introduced in 1996. The success of this design has resulted in several imitations of this design by seven other long-haul airlines. Neither Tangerine nor British Airways has benefited from these firms' flat-beds and so the imitation of the Tangerine design has led to a spillover from the design industry to the airline industry. It appears that the effect of this spillover has been to further innovation levels at British Airways who have recently introduced their second generation flat-bed in an attempt to stay one step ahead of the market.

Understanding why and when these spillovers occur is more complex than some of the other spillovers we have described. We discuss these in more detail as follows.

The following conditions determine whether product adaptation spillovers will occur:

- firms in other industries can easily adapt the ideas from firms in the Creative Industries; and
- firms in the same industry as the firm creating the idea are unlikely to replicate these ideas.

It follows that the factors which drive these conditions will also determine whether product spillovers occur. We discuss these below.

### ***Firms in other industries can easily adapt creative industry products***

For product spillovers to occur, firms in other industries must be easily able to adapt the ideas of Creative Industry firms.

The decision of a firm to adapt an idea from another product market is driven by the profit it expects to make as a result of this activity. This decision can be thought of in terms of a few key drivers:

- the cost to other firms of adapting the idea to use in their market; and
- the revenues these firms expect to receive as a direct result of the new idea.

Collectively these factors determine the additional profit firms in other markets expect to make as a direct result of the spillover. It follows that if costs of adaptation are low and/or expected revenues are high for the adapted product, inter-market spillovers will be significant.

In practice costs of replication may be low if one or more of the following hold:

- new ideas are easily understood;
- initial investment required to manufacture the new products (for example, investment in new plant) is low; and
- ongoing manufacturing costs are low, relative to the price at which the product will be sold and the manufacturing costs of competitor products.

Similarly, expected revenues will be high if:

- the product is significantly different to other products in the market;
- a relatively high price can be charged for the new product;
- the expected market is large; and
- expected product life is long.

### ***The idea is not replicated by firms in the same product market as the firm generating the idea***

As discussed earlier, spillovers cause firms to generate fewer new ideas than is optimal for society. When firms in the same product market as the firm generating the new idea replicate this new idea this leads to an intra-market

spillover. These are discussed in detail in Annexe 1 and Annexe 2. The discussions in these annexes show that intra-market spillovers can cause firms to cease generating any new ideas. This occurs because this replication leads to increased competition between the firm creating the new idea and the firm which replicates its idea. This reduces the firm's incentive to generate further ideas. It follows that for inter-market spillovers to be generated, the level of intra-market spillovers must be relatively low.

Again, the level of expected profit determines whether firms replicate their rivals' ideas. In practice, the determinants of cost and expected revenue are the same as those for inter-market spillovers (see above)<sup>16</sup>.

### 3.3 NETWORK SPILLOVERS

In practice some firms in the Creative Industries may generate agglomeration spillovers. Specifically, they may be more than other firms to attract firms from the wider economy to locate close by. This may be because they can improve the brand image of a place, or because their skilled workers value working close to them. The box below presents evidence on this spillover from the arts and film industries.

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<sup>16</sup> Note: The actual costs and revenues are likely to be different. This is because the replicator and the adapter operate in potentially very different product markets. It is also because they may be making quite different products.

## NETWORK SPILLOVERS IN THE ARTS AND FILM INDUSTRY

The UK film industry may act as a strong attractor for individuals and possibly for firms. Most of the evidence is on attracting tourists. For example, the films *Braveheart* and *Rob Roy* are believed to have increased the number of people visiting key sites from the films by 18% (compared to a 13% in visitor numbers for Scotland overall in the same year)\*. There is little hard evidence that film can motivate firms to locate in a place. However it is widely held that a film can be a valuable tool in improving a location's image and appeal.

There is also some evidence that the Creative Industries' presence in London may be a strong attractor for the Capital's firms and skilled workforce. A study by Loughborough and Heidelberg universities, concluded that the introduction of the euro and location of the European Central Bank in Frankfurt had not altered London's pre-eminence:

*"We had begun by assuming that the euro would have been more significant (in changing the dynamic of the relations between the two cities) but it came across very strongly from both London and Frankfurt that it was not an important issue at all," said Pain, one of the researchers.*

*"Frankfurt's biggest problem was the difficulty of recruiting people to work there because of its "dull" image".\*\**

London's theatres, museums and other cultural institutions may therefore provide an important element in ensuring the wider benefits that arise to the UK economy from attracting the world's elite to the City are realised.

\* Source: Research undertaken for the British Film Commission and the Scottish Tourist Board, 1997.

\*\* Source: Financial Times, 20 November 2006.

### 3.4 ARE SOME CREATIVE INDUSTRIES MORE LIKELY TO GENERATE SPILLOVERS THAN OTHERS?

In Section 2 we established three key types of spillover that firms in the Creative Industries might generate:

- knowledge spillovers;
- product spillovers; and
- network spillovers.

At this stage there is insufficient evidence to comment on which of the Creative Industries may be most likely to generate particular spillovers. As discussed above, the purpose of conducting the road test interviews was to decide whether the framework is a sensible way of conceptualising spillovers for the Creative Industries. The road tests were not designed to provide an evidence base for the precise nature of these spillovers. The sections above have discussed our spillover framework in the context of the Creative Industries and where relevant have provided examples of how these could occur in practice.

## The evidence on Creative Industry spillovers

A key outcome of the road testing phase of this study has been to confirm that our framework represents a structured and robust way of analysing spillovers in the Creative Industries. A second outcome has been to provide a series of examples of where creative spillovers are being generated. Although at this stage these examples can only be considered as provisional, anecdotal evidence, it is interesting to consider where this evidence suggests that the spillovers are being created.

Creative Industry	Spillover type		
	Knowledge (entrepreneurship)	Product	Network (agglomeration)
Design	?	✓	✓
Fashion	✓	✓	✓
Film	?	✓	✓
ILS* <i>Interactive Leisure Software</i>	✓	?	x
Music	?	✓	✓

Figure 6: A provisional taxonomy of creative spillovers to the wider economy

Source: Frontier

Figure 6 above presents our initial taxonomy of Creative Industry spillovers. This lists the spillovers we identified above as relevant to the Creative Industries. Where our road tests have provided evidence for or against a particular type of spillover occurring we have indicated this with a tick or a cross in the taxonomy. Where the evidence is inconclusive, we indicate this with a question mark.

This taxonomy suggests that each industry generates at least two different types of spillover. In terms of magnitude it is hard to rank industries according to how much of a spillover they generate. From our road tests however it appears that:

- **Knowledge spillovers** - in the form of entrepreneurship - may be generated by firms in the designer fashion, film and interactive leisure software industry;
- **Product spillovers** – as differentiated product spillovers – may be generated by the designer fashion, design and music industry;
- **Network spillovers** – as agglomeration spillovers – may be generated by the design, music, film and music industry.

We carry these conclusions over to the next section where we discuss whether the Creative Industries are in some way different or unique in their ability to generate spillovers to the wider economy.

## 4 How do we increase our understanding of Creative Industry spillovers?

The previous sections have provided a framework for understanding how spillovers could be generated by firms in the Creative Industries to firms in the wider economy. We have tested this framework through a series of road test interviews with experts from the design, fashion, film, interactive leisure software and music industry. This process has produced a series of initial hypotheses for how the Creative Industries may generate spillovers to firms in the wider economy. These suggest that spillovers are most likely to be generated in the following way:

- knowledge spillovers – through creative firms inspiring firms and individuals in the wider economy to engage in entrepreneurial activities
- product spillovers – through creative firms generating ideas which influence (rather than are replicated by) firms in the wider economy; and
- network spillovers - through groups of creative firms acting as attractors to other firms and their employees in the wider economy.

This section addresses the final two questions in our framework:

- Is there something different or unique about these spillovers, compared to spillovers generated by firms in the wider economy?
- What is required to develop a robust evidence base to support this framework?

To address the question on uniqueness we have engaged in further discussions with industry experts. If a spillover is unique as well as being valuable, it is important this is recognised. This is because these firms represent the only way of generating the valuable benefit to the wider economy. Although this question is an important one, it should not over-shadow the overall question of whether firms in the Creative Industries generate spillovers to the wider economy. Even if a spillover is not unique, its benefits should still be identified and recognised.

The final question asks what steps should be taken to understand whether these spillovers are occurring and if so, more about the value they bring to society as well as the whether or not Creative Industry firms are unique in being able to deliver these benefits. This highlights the industries this research should focus on; hypotheses which could be tested; and which techniques should be employed.

### 4.1 KNOWLEDGE SPILLOVERS

Our analysis suggests that firms in the Creative Industries may be able to generate knowledge spillovers by inspiring other individuals to start up businesses in the wider economy.

Further analysis and discussions with industry experts suggests it is unlikely that Creative Industry firms are unique in their ability to deliver these benefits. Our analysis does however suggest that the level of benefits these firms generate may be high relative to the benefits generated by firms in the wider economy.

More evidence is required to understand these spillovers more fully and Creative Industry firms' ability to generate these. We set out below more detail on the evidence that should be gathered as well as how this could be obtained.

#### **4.1.1 Additional research on knowledge spillovers**

To understand whether firms in the Creative Industry may generate these entrepreneurship knowledge spillovers we would need to test the following hypotheses:

- firms in the creative industries are entrepreneurial; and
- the nature of this entrepreneurial activity is in some way inspiring.

Our framework for testing these is shown in Table 1 below.

<b>Spillover description</b>	<b>Hypotheses to be tested</b>	<b>Analytical technique</b>	<b>Groups surveyed</b>	<b>Analysis</b>	<b>Resources required</b>
Entrepreneurship knowledge spillover	Individuals in the Creative Industries are more entrepreneurial those in the wider economy.	Quantitative analysis on the performance of start-ups in the Creative Industries and the wider economy	Firms in the Creative Industries and the wider economy	Whether start-ups are more prevalent, long-lived and high performing in the Creative Industries than in the wider economy.	The IDBR database which contains information on firm start ups and turnover and employment performance
	Entrepreneurial activity in the Creative Industries is more inspiring to other firm start ups than similar activity in the wider economy.	Short email/ telephone surveys to around 500 firms containing mainly closed questions.  In depth face to face interviews with firms in the wider economy who were inspired by Creative Industry start-ups.	Email/ telephone survey: Owners of start-up firms in the wider economy across a range of industries.  In-depth interviews: founders of recent start-up firms in the wider economy. These should be sampled from email/telephone survey respondents who stated that they were inspired by the Creative Industry start-ups	Email/ telephone survey: Explore the reasons why each firm started up and the potential role of other start-ups in inspiring this. Identify which industries these other start-ups operate in.  In-depth interviews: Explore how important a role was played by the Creative Industries and what made them more inspirational than other start-ups in the wider economy	Market research resources – e.g., Ipsos MORI - to conduct the email or telephone interviews

Table 1: Researching knowledge spillovers

Source: Frontier

## 4.2 PRODUCT SPILLOVERS

Our analysis suggests that firms in the Creative Industries may be able to generate product spillovers by providing new ideas which can be adapted and used by firms in the wider economy.

As for knowledge spillovers, further analysis and discussions with industry experts suggests it is unlikely that Creative Industry firms are unique in their ability to deliver these benefits. Our analysis does however suggest that the level of benefits these firms generate may be high relative to the benefits generated by firms in the wider economy.

More evidence is required to understand these spillovers more fully and Creative Industry firms' ability to generate these. We set out below more detail on the evidence that should be gathered as well as how this could be obtained.

### 4.2.1 Additional research on product spillovers

Section 3.2.2 above highlighted the fact that product spillovers are most likely to be generated when adaptation rates are high and replication rates are low for an idea. It also discussed the key drivers of these spillovers. These are summarised in Table 2 below.

<b>Drivers of product replication and adaptation</b>
New ideas are easily understood
Initial manufacturing investment is low
Ongoing manufacturing costs are low relative to the competitor product costs and/or the price at which the product can be sold
The product is significantly different to other products in the market
A relatively high price can be charged for the new product
The expected market is large
The expected product life is long

Table 2: Key drivers of product replication and adaptation

Source: Frontier

The next step on understanding more about product spillovers is to examine whether these drivers apply to Creative Industry ideas and the markets which adapt these ideas. A further step is to compare these results with a similar investigation for ideas which have been generated by firms in the wider economy. This would enable a comparison between the spillovers generated by the Creative Industries and those created by the wider economy.

Our proposed framework for addressing these issues is shown in Table 3 below.

Spillover description	Hypotheses to be tested	Analytical technique	Groups surveyed	Analysis	Resources required
Replication spillovers	Ideas generated by the Creative Industries are more likely to be adapted than ideas generated by firms in the wider economy; <i>and</i> Ideas generated by firms in the wider economy are more likely to be replicated than ideas generated by firms in the Creative Industries.	Face to face interviews to identify key UK industry innovations and their characteristics	Wide range of sector associations to cover all of the key UK industries	Key aim of the interviews would be to: (a) identify key innovations for all or most of UK industry  (b) understand the characteristics of the innovations - in particular – complexity of idea; investment required to produce the good or service; ongoing manufacturing cost relative to rival products; extent to which new product is differentiated from rival products; relative price of the new product or service; expected market size and product life.  [these characteristics determine the likelihood that a product is replicated]	List of sector association contacts
		Follow-up face to face interviews	Firms identified as producing significant innovations	Where the trade association has been unable to provide all the required information follow-up interviews could be explore the characteristics of the innovations – i.e., the information requested in (b) above	None
	Firms in the wider economy draw on the ideas that are generated by the Creative Industries.	Telephone or email survey	A sample of all firms in the wider economy	Explore extent to which firms in the wider economy are influenced by Creative Economy ideas. The survey would present firms with a list of Creative Industry innovations (derived from the analysis above) and ask them to signal which innovations they had been influenced by; to what extent they had been influenced; and the nature of this influence.	List of Creative Industry innovations from the research detailed above

Table 3: Researching product spillovers

Source: Frontier

### 4.3 NETWORK SPILLOVERS

Our discussions with industry experts suggest that firms in the Creative Industries may be unique in their ability to make an area attractive. This network spillover attracts firms and key workers to an area, benefiting firms that are already located there. It is likely that only a subset of Creative Industries will generate this spillover. Our research suggests that these will be the arts, performing arts, film, music and designer fashion industries. The research we suggest below should test whether this is correct.

To explore these spillovers further the following hypotheses should be tested:

- cities, regions or countries with relatively high concentrations of Creative Industry firms are able to attract more inward investment than other places;
- skilled workers in the wider economy base their decision on where to work in part on the potential for engaging in cultural activities; and
- skilled workers prefer to work in locations where there is a relatively high presence of creative firms and individuals.

Table 4 below sets out our proposed framework for addressing these.

Spillover description	Hypotheses to be tested	Analytical technique	Groups surveyed	Analysis	Resources required
Attractor spillovers	Firm in the Creative Industries tend to cluster.	Geographical mapping	All firms in the Creative Industries	<p>Use Mapinfo (or similar) geographical mapping software to map the geographic location of the UK's Creative Industries. A separate map should be created for each Creative Industry. This would allow any clusters of Creative Industries, their nature and their location to be identified.</p> <p>To do this a list of all the UK's Creative Industry firms, their industry and postcode would be required. The IDBR database provides 5-digit SIC code data for nearly all UK firms (from which Creative Industry firms can be identified). It may also contain postcode data for these firms.</p>	Firm level data containing 5-digit SIC code and postcode information.
	Skilled workers are attracted to work in areas with high concentrations of the Creative Industries	Email survey	Post-graduate, high achieving students in UK and European universities who are applying for jobs in industry	Explore the key factors which are influencing these students' choice of employer and the extent to which the students trade-off these factors in coming to their final decision. Factors which could be explored could include: the importance of firm location; the reasons why this is important; and its importance relative to other location decision factors	Market research resources – e.g., Ipsos MORI - to implement the survey
		Email survey/ telephone survey	HR managers in high value added firms	Understand which factors enable the firm to attract highly skilled and experienced employees. Learn who the firm's competitors are and whether they are in any way advantaged by their location or image	
Entrepreneurs		Explore the reasons behind the entrepreneurs' firm location choice and the role that culture, other Creative Industries played in influencing this decision.			

Table 4: Researching network spillovers

Source: Frontier



## Annexe 1: Intra-market knowledge and product spillovers

This study is focused on understanding the spillover benefits that firms in the Creative Industries may generate to firms in the wider economy. Two ways in which spillovers may be generated are through knowledge spillovers and through product spillovers. These spillovers may occur as:

- inter-market spillovers – spillover benefits accrue to firms competing in a *different* product market to the firm which generated the new idea; or as
- intra-market spillovers - spillover benefits accrue to firms competing in the *same* product market as the firm which generated the new idea.

Our analysis of these types of spillover suggests that only inter-market spillovers are relevant to our analysis. This is because intra-market spillovers will only benefit firms competing in the same product market. It is unlikely that this would apply to firms outside of the Creative Industries.

Inter-market knowledge and product spillovers are covered in some detail in the main body of this report. This annexe sets out our analysis of intra-market knowledge and product spillovers.

### INTRA-MARKET KNOWLEDGE SPILLOVERS

Intra-market spillovers benefit firms operating in the same product market as the firm generating the spillovers. To further understand this we have adapted Jaffe (1996)'s framework. This is shown below in Figure 7.

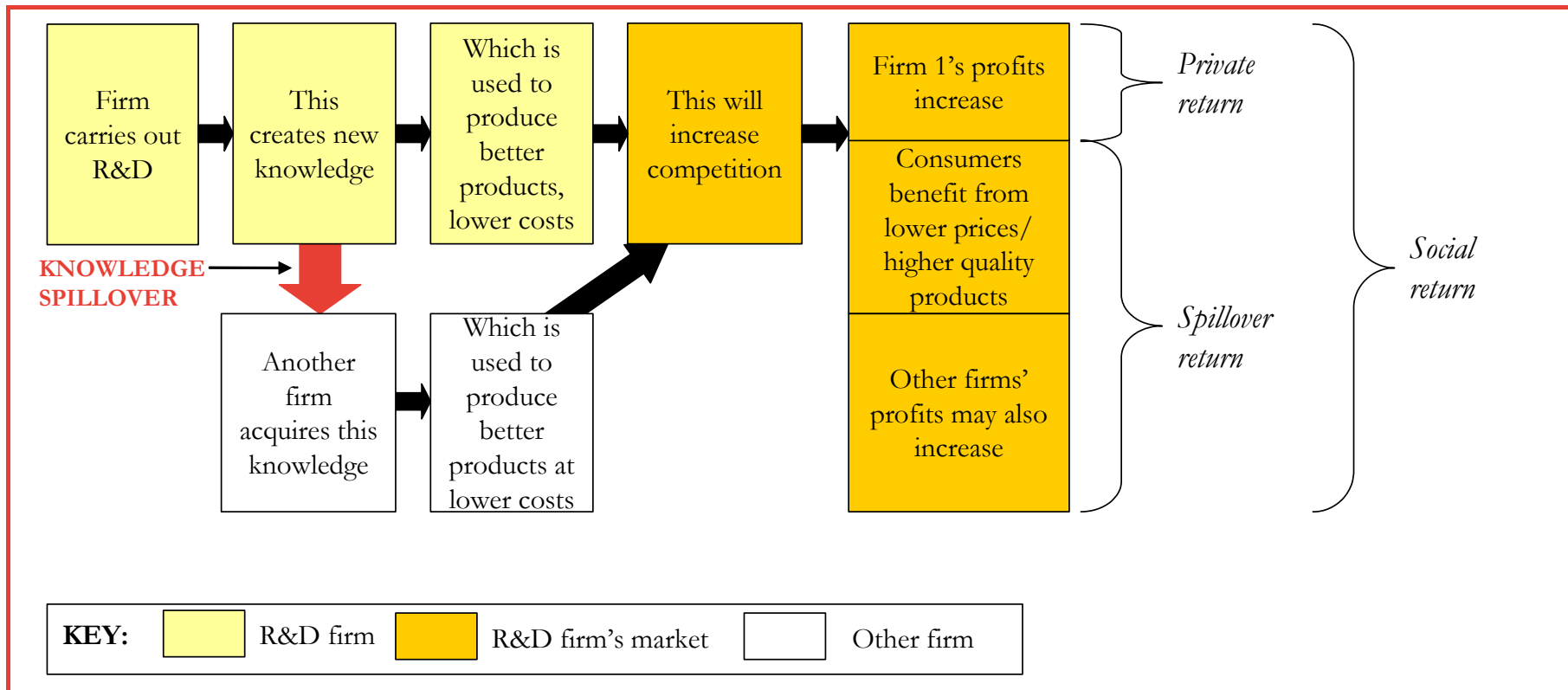


Figure 7: Intra-market knowledge spillovers

Source: Jaffe (1996) and Frontier

The spillover process illustrated in Figure 7 can be described as follows.

- The first box (top left) in Figure 7 considers a firm which engages in research for new ideas. This could be a faster or cheaper method of producing its output or a new product or service.
- This new idea exists initially as knowledge (represented by the next box in the diagram). This may be written down, embodied in prototype products or simply contained in the minds of the people who have been working on the project. As this knowledge allows the firm to compete more effectively, it is also valuable to its competitors.
- An intra-market knowledge spillover (the red arrow in Figure 7) occurs if rival firms acquire this new knowledge without rewarding the firm which created the knowledge. In practice this may occur through employees going to work for the firm's competitors. Alternatively rival firms could read about the new idea in a journal or trade article.

The outcome of the knowledge spillover is illustrated by the final row of boxes in Figure 7. The firm which created the knowledge makes an increased profit from its new idea. This occurs because firms can charge a higher price to their consumers or sell more of their product.

- Rival firms which obtained this knowledge increase their profits. This occurs because rival firms can copy the new idea and compete directly with the firm which created the idea.
- Consumers may derive spillover benefits from better quality goods or higher quality products<sup>17</sup>.

### ***The problem with intra-market spillovers***

As already discussed, spillovers lead to an under-provision of benefits by the market (a market failure). With intra-market spillovers, the problem occurs because:

- the firm creating the knowledge cannot charge these other firms for using its knowledge; and
- these rival firms compete against the firm in this product market.

The extent to which a firm under-provides spillover benefits can be measured by the difference between the total social return and the private return of the firm generating the benefits ('the spillover gap'). This is also illustrated in Figure 7. We discuss the spillover gap in more detail in Annexe 2.

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<sup>17</sup> Although these benefits are not the focus of our study, it is worth noting that these will only exist if consumers do not pay a price equal to their full willingness to pay for a good – economists refer to this as consumer surplus.

## **INTRA-MARKET PRODUCT SPILLOVERS**

Jaffe (1996)'s framework can be adapted to understand how creative intra-market product spillovers occur. This is shown below.

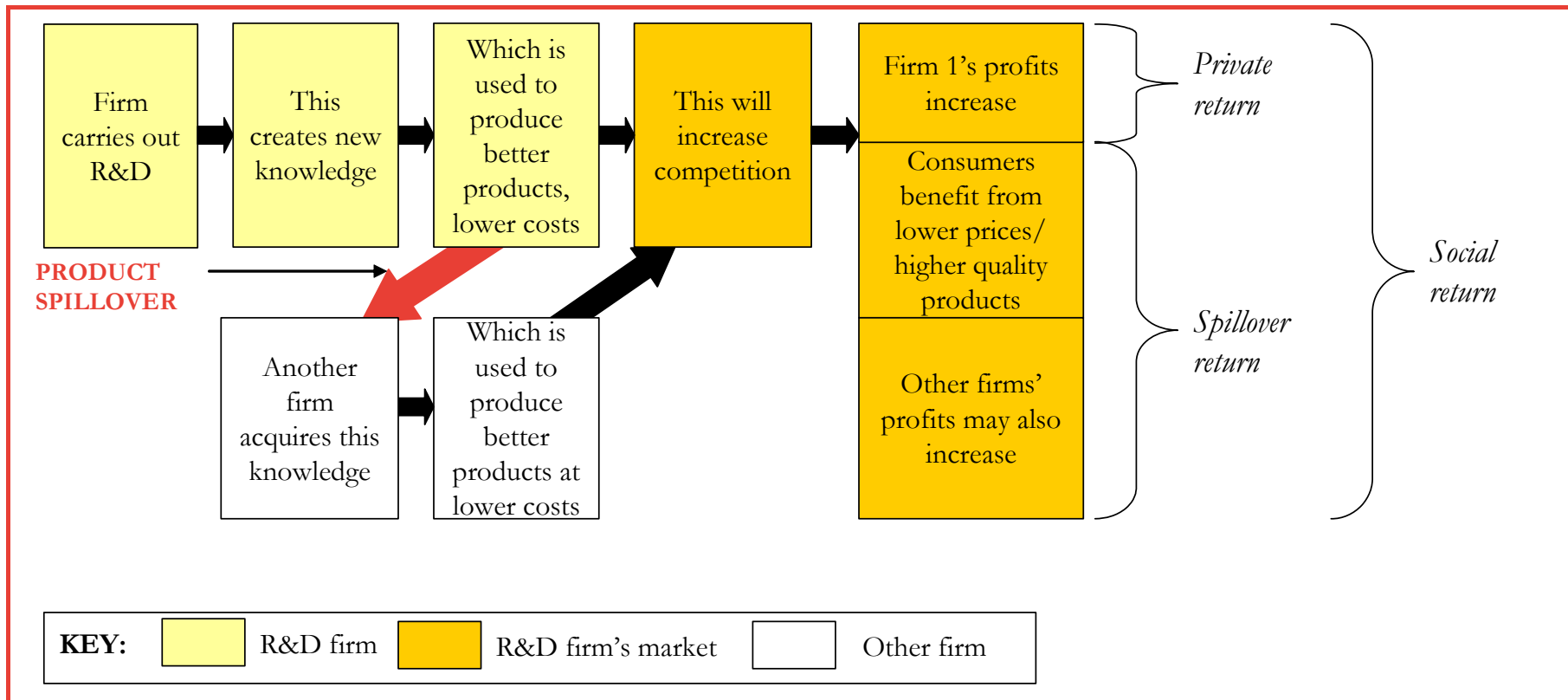


Figure 8: Intra-market knowledge spillovers

Source: Jaffe (1996) and Frontier



The spillover process illustrated in Figure 8 can be described as follows.

- The first box (top left) in Figure 8 considers a firm which engages in research for new ideas.
- This new idea exists initially as knowledge (represented by the next box in the diagram).
- This knowledge is embodied in a new or improved product and placed on the market by the firm (shown in the next box in Figure 8). This knowledge is valuable to its rival firms as it will allow them to compete more effectively in the market.
- An intra-market product spillover (the red arrow in Figure 8) occurs if firms in the same market acquire this new knowledge without rewarding the firm which created this knowledge. Firms can do this by reverse engineering the new product once it is on the market.

The outcome of intra-market product spillovers is illustrated by the final row of boxes in Figure 8. These are the same outcomes we listed for intra-market knowledge spillovers above.

- The firm which created the knowledge makes an increased profit from its new idea. This occurs because firms can charge a higher price to their consumers or sell more of their product.
- Rival firms which obtained this knowledge increase their profits. This occurs because rival firms can copy the new idea and compete directly with the firm which created the idea.

Consumers may derive spillover benefits from better quality goods or higher quality products<sup>18</sup>.

### ***The problem with intra-market spillovers***

The problems we discussed above for intra-market knowledge spillovers also apply to intra-market product spillovers:

- the firm creating the product is not (fully) rewarded by the firms which copy the product; and
- the firms which copy the product use this to compete against the firm in this product market.

The extent to which a firm under-provides spillover benefits can be measured by the difference between the total social return and the private return of the firm generating the benefits ('the spillover gap'). This is illustrated in Figure 8. We discuss the spillover gap in more detail in Annexe 2.

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<sup>18</sup> Although these benefits are not the focus of our study, it is worth noting that these will only exist if consumers do not pay a price equal to their full willingness to pay for a good – economists refer to this as consumer surplus.



## Annexe 2: Assessing the extent of the market failure for knowledge and product spillovers

As discussed in Section 2, even if a spillover can be identified, it is not clear to what extent there is a market failure – or put another way, how much more spillover generation a firm should be doing. This is often termed the ‘spillover gap’.

Section 2 introduced the concept of two different types of spillover:

- **intra-market spillovers** – where the spillover benefits accrue to firms competing in the same product market; and
- **inter-market spillovers** - where the spillover benefits accrue to firms competing in a different product market to the firm generating the benefit.

Figure 9 below illustrates the spillover gap for these two types of spillover. We use this to understand the factors which drive the spillover gap – or under-investment by the firm. This leads us to a set of rules as to the conditions where we would expect to see a significant or very small spillover gap, or market failure.

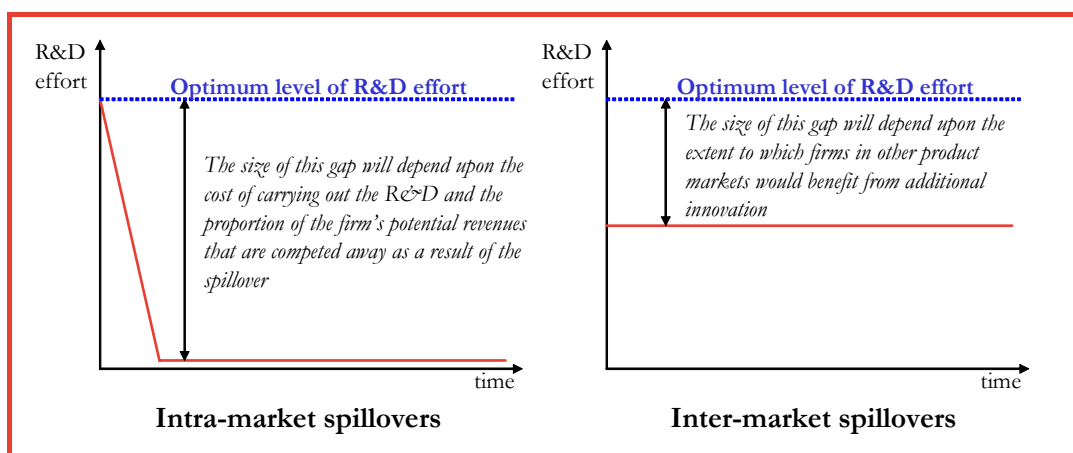


Figure 9: The spillover gap for intra and inter market spillovers

Source: Frontier

This figure illustrates for these two types of spillover, the level of innovation that a firm generating spillovers may make. This is illustrated by the red line. The starting point for both is that point when the firm starts to innovate – i.e., before it starts to generate spillovers. The amount of activity that the firm should be carrying out in relation to the optimum level of spillovers for society is illustrated by the dotted blue line in the diagrams.

In the case of intra-market spillovers, the red line starts at the level of optimal innovation. At this point, the firm carrying out innovation does not realise that its ideas will be copied and its profits eroded by its competitors. As the firm realises that its competitors are replicating its ideas and sharing its profits, it is dis-incentivised to carry as much research in the future and so the level of research it carries out falls over time. In the extreme case, where all of its profits are competed away by rival firms, the firm ceases to carry out any research. This is represented by the horizontal red line in the first graph. This implies that any research to identify intra-market spillovers may have difficulty finding evidence to support their existence as the firms which generated them may have ceased to do so.

The second graph in Figure 9 shows the level of investment a firm makes when there are inter-market spillovers. The horizontal red line shows that the firm's level of investment remains constant. This is because the spillovers do not affect its incentive to innovate. The dotted horizontal blue line represents the level of investment the firm should be making, from society's perspective. Because the firm is not rewarded by firms in other markets copying its ideas and because this replication does not affect the firm's own profits, it does not alter its behaviour.

Although Figure 9 suggests that the spillover gap is larger in the case of intra-market spillovers, this is not necessarily the case. To understand this we need to understand the key drivers of the spillover gap.

For intra-market spillovers, there are two key drivers of the spillover gap:

- the cost of carrying out the research and developing the idea (R&D); and
- the level of revenue the firm expects to receive as a result of having carried out the R&D relative to amount it actually receives.

Collectively these factors determine the loss of profit to the firm as a result of the spillovers. If its costs are high then a loss of revenue from spillovers could mean that the venture makes a loss for the firm.

For inter-market spillovers, there are also two drivers of the spillover gap:

- the cost to other firms of adapting the idea to use in their market; and
- the revenues these firms receive as a direct result of the new idea.

Collectively these factors determine the additional profit the firms in other markets make as a direct result of the spillover. It follows that if costs of adaptation are low and revenues are high in other product markets, the firm will be under-investing in the generation of new ideas.

## Annexe 3: Literature evidence on creative spillovers to individuals in the wider economy

This study has focused on the spillovers generated by firms in the Creative Industries to firms in the wider economy. In addition to these spillovers, Creative Industry firms may also generate significant spillovers to individuals in the wider economy. This annexe provides a brief overview of the evidence on these spillovers.

The literature presents a wide range of evidence on the positive spillover effects occurring from producers to individuals. Common examples include:

- *Education spillovers*: For example, by generating a widespread acceptance of a common set of values, or by increasing the productivity of people working alongside an educated worker<sup>19</sup>.
- *Healthcare spillovers*: health care reduces the disease risks for all individuals in the economy as well as the individual receiving treatment.

We list selected references for this body of literature at the end of this annexe.

### POSITIVE EXTERNALITIES IN THE CREATIVE INDUSTRIES

The analysis of positive spillover effects from the Creative Industries to the wider economy began recently in the literature. We summarise some key examples of the literature evidence on spillovers of the Creative Industries to individuals (rather than firms) in the wider economy below.

Chartrand (1983) suggests that the economic impact of the fine arts includes indirect and non-quantifiable contributions to the society. This impact involves contributions to the quality of life, cultural identity and pluralism<sup>20</sup>.

- The fine arts, by uniting people in celebration of their common heritage, forge lasting ties among people who ordinarily would be divided by race, age, religion, language, profession or income barriers. To the degree that the fine arts contribute to such ties, the fine arts may contribute to the development of a more cooperative economy.

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<sup>19</sup> J. C. Hall. "Positive Externalities and Government Involvement in Education", *Journal of Private Enterprise*, Volume XXI, Number 2, Spring 2006, 165-175.

<sup>20</sup> H.H. Chartrand "Cultural Economics – Economic Impact assessment", *submitted to The Royal Commission on the Economic Union and Development Prospects of Canada, Ottawa, December 1983*

- There is an intimate relationship between cultural pluralism and the contemporary competitive economy. The fine arts contribute to three dimensions of cultural pluralism including psychological diversity among individuals, diversity of life-styles and tolerance of alternative life-styles. This contribution to cultural pluralism may lead to a contribution to a competitive economy, where a prerequisite level of tolerance is required for people of different backgrounds to work productively together.

The Cultural Policy Working Group at the National Conference of State Legislatures (2003) also found similar effects for cultural programs. For example,

- students who study the arts demonstrate stronger overall academic performance;
- cultural organizations serve as community centres in the rural areas; and
- cultural infrastructure helps to provide the impetus for giving people the reason to visit downtown – e.g., performing arts centres and museums draw people to cities.

In their 2003 study, “the artistic dividend”, Markusen and King recognise spillover benefits such as:

- artists’ creativity skills enhancing the production of goods and services in other sectors; and
- the contribution of the arts to the quality of life of a region.

The study of economic impact emphasis the spillover effects from the museum expansion much in the same lines with other authors. In particular, they say that museums act to improve social well-being and inter-group tolerance and understanding through their displays of art that depicts our common humanity and the beauty and spiritual power of our natural environment.

## REFERENCES

The following references are a selection of the key readings on spillovers.

- R. H. Coase. “The Problem of Social Cost”, *Journal of Law and Economics*, Vol. 3. (Oct., 1960), pp. 1-44.
- R. H. Coase. “The Lighthouse in Economics”, *Journal of Law and Economics*, Vol. 17, No. 2. (Oct., 1974), pp. 357-376.
- R. H. Coase. “The New Institutional Economics”, *The American Economic Review*, Vol. 88, No. 2, *Papers and Proceedings of the Hundred and Tenth Annual Meeting of the American Economic Association*. (May, 1998), pp. 72-74.
- P. A. Diamond “Consumption Externalities and Imperfect Corrective Pricing”, *The Bell Journal of Economics and Management Science*, Vol. 4, No. 2 (Autumn, 1973), pp. 526-538.

- The Bell Journal of Economics and Management Science, Vol. 4, No. 2. (Autumn, 1973), pp. 526-538.
- J. C. Hall. "Positive Externalities and Government Involvement in Education", Journal of Private Enterprise, Volume XXI, Number 2, Spring 2006, pp. 165-175.
- M. Haviv; Y. Ritov "Externalities, Tangible Externalities, and Queue Disciplines", Management Science, Vol. 44, No. 6. (Jun., 1998), pp. 850-858.
- B. R. Nault, A. S. Dexter. "Adoption, Transfers, and Incentives in a Franchise Network with Positive Externalities", *Marketing Science*, Vol. 13, No. 4 (Autumn, 1994), pp. 412-423.
- E. S. H. Yu "Inter-Industrial Externalities, Technical Progress and Welfare". Southern Economic Journal, Vol. 54, No. 2. (Oct., 1987), pp. 412-421.
- Handbook of the Economics of Innovation and Technological change, edited by P. Stoneman, Blackwell, Oxford UK and Cambridge USA, 1995.
- D. N. Hyman Public Finance. 8th edition, Thomson, South-Western, 2005.

The following references provide a list of the key literature on Creative Industry spillovers to individuals in the wider economy.

- H.H. Chartrand "Cultural Economics – Economic Impact assessment", submitted to The Royal Commission on the Economic Union and Development Prospects of Canada, Ottawa, December 1983.
- "Investing In Culture, Innovations In State Policy", report by the NCSL Cultural Policy Working Group, February 2003.
- F. Cartensen and others, "The Economic Impact of thr New Britain Museum of American Art Expansion", Connecticut Center For Economic Analysis, June 2000.
- Filer, R.K. (1989), 'The Economic Condition of Artists in America', in D.V. Shaw et al. (eds), Cultural Economics 88: An American Perspective.
- Guetzkow "How the arts impact communities" (2002), prepared for the "Taking the measure of culture conference, Princeton University, June 7-8, 2002.
- Markusen and D. King "The Artistic Dividend: The Arts' Contributions to Regional Development", Project on Regional and Industrial Economics, Humphrey Institute of Public Affairs, July 2003.
- Matarasso, F. "Use or ornament? The social impact of participation in the arts" (1997).
- Muschamp, P. "Arts education: an Ofsted perspective" HMI (2004) IPPR
- Winner, E. and Hetland, L "The arts in education: evaluating the evidence for a causal link" (2000).
- R. Penne and J. Shanahan. "The Role of the Arts in State and Local Economic Development." In Economic Impact of Arts: A sourcebook,

edited by William T. Pound. Washington , DC: National Conference of State Legislatures, 1990.



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