

INNOVATION & PRODUCTIVITY 2
INFORMATION, BARRIERS & POLICY SUPPORT
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BUSINESS AND ECONOMY

SUMMARY

- Innovation is the main driver of long run economic growth and prosperity. Understanding innovation is therefore a key requirement for understanding the growth process and for designing policies to support that process.
- The South West economy performs relatively poorly with respect to its overall level of productivity compared with other UK regions. Firms in the South West also have relatively low levels of innovation activity compared to firms in the UK as a whole and in the South East, the strongest performing UK region in this respect.
- This bulletin focuses on three aspects of innovation that are particularly important for policy: the role of information networks and collaboration in supporting innovation activities and outputs; the barriers perceived by firms as limiting their innovation activities and/or the results of those activities; and receipt of public policy support as a determinant of innovation performance.
 - External information sources and collaborative innovation activities are both supportive of improved innovation performance. In general, firms in the South West make less use of information networks than do firms in the South East.
 - Innovation active firms in the South West are more likely to report a range of barriers as being highly important in constraining their innovation than are active firms in the South East.
 - Firms in the South West were less likely to have received public policy support from UK institutions (local, regional or national) than were firms elsewhere in the UK. There is strong evidence that public support for innovation is positively related to innovation activities, outputs and impacts.
- In all of these respects, however, differences between firms in the South West and the South East can largely be 'explained' by differences in firm characteristics underlying innovation activity and performance (size, industry, scope of markets, etc.). There is, in general, little evidence of significant differences between South West and South East firms once these factors have been taken into account.
- The major exception relates to public support for innovation activities. Firms in the South West are significantly less likely to receive support from local/regional or national authorities than are otherwise similar firms in the South East. South West firms are, however, more likely to receive innovation support from the EU than are South East firms.
- Our simulations suggest that increasing use of external knowledge by South West firms towards the levels seen in the South East, and similarly expanding the extent of collaborative innovation activities, would have only minor effects on innovation outputs and economic performance. South West firms are less likely to receive public support for innovation from local and national sources than are firms in the South East, after allowing for firm-level determinants of innovation support. Removing this 'conditional'

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gap in public support would have a more substantial positive effect on innovation performance and economic activity in the region.

- These results do not themselves justify an expansion in public support – which should be based on detailed consideration of the costs and benefits involved, and particularly of the presence of knowledge spillovers. It may, however, suggest one area of policy where additional research would be warranted.

INTRODUCTION

Innovation is central to the process of long run economic growth, and so to the future prosperity of all economies. Understanding innovation is therefore a key requirement for understanding the growth process, and for designing policies to support that process.

A companion bulletin *Innovation and Productivity 1* examined the innovation performance of firms in the South West, comparing them with firms in the South East (the strongest performing UK region in this regard), identified the causes of any observed under-performance by South West firms, and investigated the implications of such under-performance for business performance (productivity and growth). That bulletin considered simulations that examined the potential impact on the South West economy of improvements in innovation performance – related to an expanded role for innovative products among all firms.

This bulletin builds on this analysis by looking in more detail at three aspects of innovation performance that are of particular importance to innovation policy. First we examine the role of information networks and collaboration in supporting innovation activities and outputs. We then look at the main barriers perceived by firms as limiting their innovation activities and/or the results of those activities. Finally, we look directly at receipt of public policy support as a determinant of innovation performance. In all cases, as in the companion paper, we compare South West firms with firms in the South East of England. We present the results of simulations for scenarios related to increased use of external knowledge by South West firms, reduced barriers to innovation, and increased public policy support for innovation.

INNOVATION & BUSINESS PERFORMANCE IN THE SOUTH WEST: OVERVIEW

For convenience, we here summarise the main results of the companion paper: *Innovation & Productivity 1*.

The South West is one of the top performing UK regions in terms of R&D expenditures by business. R&D in the South West is strongly concentrated within a single industry – Aerospace – which accounts for almost half of all business R&D in the region during 2005.

Evidence from the *UK Innovation Survey* suggests that firms located in the South West of England are less likely to be engaged in most types of innovation activity, less likely to introduce actual innovations, derive a smaller share of revenues from innovative products, and are less likely to report various benefits of innovation than are their counterparts in the South East or in the UK as a whole. To a large extent, however, these differences in innovation performance can be explained by regional variation in the characteristics of firms that determine their innovation performance (size, industry, scope of product markets, skills, etc.). Evidence from the UK Innovation Survey suggests that firms in the South West are disadvantaged with regard to most of these determinants of innovation compared with those in the South East, and in many cases with those in other parts of the UK. The main exception concerns the importance of innovative products to the revenues of South West firms. Firms in the South West derive a significantly smaller share of their total revenues from innovative products (and particularly from marginal as opposed to novel innovations) than do otherwise similar firms in the South East.

Many aspects of innovation activity are significantly related to improved business performance – higher productivity and faster growth of employment, productivity and output. More innovative firms tend to perform better than otherwise similar, but less innovative, firms in terms of these basic performance measures. Improvements in innovation performance can therefore have a positive impact on growth and productivity within the South West economy over the longer term.

INFORMATION & COLLABORATION

Innovation surveys often provide evidence on the extent to which firms are engaged with knowledge networks. Research using innovation survey data has shown a link between measures of networking – such as the use of external information sources or the extent of collaboration on innovation activities – and successful innovation performance. Firms that make use of external information sources such as other firms (suppliers, customers and competitors), Universities and research institutes, and publications, have higher levels of innovation activity (internal research & development, etc.) and are more successful in generating innovation outputs (such as product and process innovations).

Table 1 summarises the results of our analysis of information sources and innovation using the UK Innovation Survey data. It indicates where there is a significant relationship between the importance firms ascribe to external information sources and their innovation activities, outputs and impacts, after controlling for other determinants of innovation performance such as firm size, industry, and workforce skills. It shows that firms that place greater importance on external information sources are, in general, more likely to engage in all forms of innovation activity, are more likely to successfully introduce new products (particularly novel products) and novel process innovations, and are more likely to report a range of business benefits as a result of their innovation activities.

Table 1: Information sources and innovation performance

Sign of significant effects, conditional on other determinants of innovation

	Use of external information sources:			
	Institutions	Market	Other	Collaboration
Activities				
Some innovation activity	0	+	+	+
In-House R&D	+	+	+	+
External R&D	0	+	+	+
Machinery etc.	0	+	+	+
External Knowledge	+	+	+	+
Training	0	+	+	+
Design	0	+	+	+
Marketing	+	+	+	+
Outputs				
Product Innovation	+	+	0	+
Process Innovation	0	+	+	+
Novel Product (new to market)	+	+	0	+
Novel Process (new to industry)	0	+	+	+
% of Turnover from significantly improved products	0	+	+	+
% of Turnover from new to enterprise products	0	+	+	+
% of Turnover from new to market products	+	+	0	+
% of Turnover from all product innovations	0	+	0	+
Corporate Strategy	0	+	+	+
Advanced Management Techniques	0	+	+	+
Organisational Structure	0	+	+	+
Marketing Innovation	+	+	+	+
Impacts				
Increased product range	+	+	+	+
Expanded markets	+	+	+	+
Improved product quality	0	+	+	+
Improved flexibility of production	+	+	+	+
Increased production capacity	0	+	+	+
Reduced unit costs	+	+	+	+
Reduced environmental impact or improved health & safety	0	+	+	+
Regulatory compliance	0	+	+	+
Increased value added	0	+	+	+

Source: Authors' analysis based on UK Innovation Survey, 2005

Table 2: Sources of information for innovation

% of firms rating source as highly important, South West vs. UK and South East

	SW vs.	
	UK	SE
Within enterprise or group	-	-
Suppliers	-	-
Customers	+	-
Competitors	-	-
Consultants, commercial labs, etc.	-	-
Universities/HE	+	-
Public Research Institutes	+	-
Conferences, trade fairs, etc.	-	-
Scientific journals & trade publications	-	-
Professional & industry associations	+	-
Technical, industry or service standards	+	-
Collaboration on Innovation	-	-

Source: UK Innovation Survey, 2005

Data from the UK Innovation Survey suggest that firms in the South West are less likely to regard external sources of information as highly important to their innovation activities than are those in the South East of England (Table 2). On the other hand, South West firms were more likely to report some external sources as being highly important to innovation than was the case for the UK as a whole (customers, higher education institutions, public research institutes, professional & industry Associations, and technical standards).

Econometric analysis of the Innovation Survey data shows that the reported importance of the various information sources listed in Table 1 is significantly related to business characteristics such as size (employment), market scope (local markets, export markets), industry and employee skills (graduate employment). In general, firms are more likely to report that external information sources are important to their innovation efforts if they are large, export, and have high levels of graduate employment. This is true for all of the main external sources of information: including market sources, research institutions, and other sources.

For most types of information, these firm-level characteristics fully account for the relatively low importance attributed to information sources by South West businesses compared with those in the South East. The exception is for information from research institutions (Universities and Public Research Institutes). There is some (weak) evidence that firms in the South West are less likely to rate such sources as important to their innovation efforts than are those in the South East, even after allowing differences in business characteristics between the two regions.

Overall, information from research institutions appears to be less important for innovation than are other information sources (Table 1). Nevertheless firms that regard information from research institutions as highly important to their innovation activities are more likely to engage in some types of activities (in-house R&D, acquisition of external knowledge, marketing of innovative products) than are otherwise similar firms who do not emphasise such information. Firms that make use of information from research institutions are also more successful in generating some types of innovation outputs (new and novel products, and marketing innovations) and derive a higher share of revenues from innovative products. Finally, the importance firms attach to information from research institutions is positively associated with increases in product range, expanded product markets, improved flexibility and cost reductions as a result of innovation activities. The relatively weak links between South West firms and research institutions suggested by the Innovation Survey data may, therefore, suggest some scope for improved innovation performance by strengthening these linkages.

BARRIERS TO INNOVATION

Innovation supports improved business performance. We might therefore expect most firms to be motivated to innovate, and that if a firm does not engage in innovation, or if it is unsuccessful in generating innovation outputs, then that would at least partly reflect the presence of barriers in the way of its innovation activities. Recent empirical evidence into innovation barriers suggests, however, a somewhat surprising finding: the more a firm is involved in innovation activities, the more likely it is to report barriers to innovation, and the greater the importance it attaches to those barriers.¹ The explanation given for this is that barriers to innovation are ‘revealed’ to firms in the course of their innovation activities. As firms carry out innovation activities, they become increasingly aware of the difficulties involved, but are not necessarily deterred by these difficulties. Under this interpretation, the fact that firms attach high importance to barriers to innovation may partly reflect the depth of their engagement with innovation, and partly reflect the ‘objective’ importance of those barriers within the firm’s business environment.

Different types of company are likely to confront different barriers to innovation. Large established firms are more likely to face barriers to innovation related to their resistance to changing processes or products in such a way as potentially to de-stabilize their existing market position.² Smaller and newer firms, on the other hand, principally face barriers related to resource constraints and to market dominance by established firms.

This interpretation relates primarily to firms that are actively involved in innovation. A different picture emerges when looking at firms that do not innovate.³ In that case, the key distinction is between firms that are trying to innovate but are struggling to do so, and those that have no need or desire to innovate. Barriers to innovation can be at least as important to those firms that are trying to innovate, but have not succeeded in bringing forward new products or processes, as they are among innovating firms. However, firms that are not trying to innovate will have a lower level of awareness of, and concern for, barriers to innovation. The perception that barriers to innovation exist and are important may, once again, reflect the extent of firms’ engagement with innovation – or at least that their desire to innovate is blocked by the presence of those barriers.

Table 3: Barriers to innovation

% of firms rating barriers as highly important, South West vs. UK and South East

	All firms		Active firms		Inactive firms	
	SW vs UK	SW vs SE	SW vs UK	SW vs SE	SW vs UK	SW vs SE
Economic risks	-	+	+	+	-	-
Direct innovation costs	+	+	+	+	+	+
Cost of finance	-	+	-	+	-	+
Availability of finance	-	-	-	+	-	-
Lack of qualified personnel	-	+	+	+	-	+
Lack of information on technology	+	+	+	+	-	-
Lack of information on markets	-	-	+	+	-	-
Market dominated by established firm	+	+	+	+	-	-
Uncertain demand for innovative product	+	-	+	+	-	-
Need to meet UK regulations	+	+	+	+	+	+
Need to meet EU regulations	+	+	+	+	+	+

Source: Authors’ calculations based on UK Innovation Survey, 2005

¹ E.g. Arundel, 1997; Baldwin & Lin (2002); Iammarino et al (2007); D’Este et al (2008).

² Ferriani et al (2007).

³ D’Este et al (2008).

Table 3 shows the importance of barriers to innovation among firms that have produced innovative outputs and those that have not, comparing firms in the South West with those in the South East and in the UK as a whole. Among active firms, South West businesses are more likely to report that all barriers are highly important than are those in the South East. Given the lower general levels of innovation activity among South West firms, these differences are unlikely to reflect the ‘revealed barriers’ interpretation – that South West firms are more aware of barriers because they are more engaged with innovation. Rather, it suggests that these barriers are actually more important for South West firms. In contrast, inactive South West firms (those that have not introduced new products or processes, etc.) are generally less likely to report most barriers to innovation than are firms in the South East. The exceptions are barriers related to resource constraints (direct innovation costs and cost of finance, lack of skills) and regulatory barriers.

As with other aspects of innovation, differences between the South West and the South East (and most other UK regions) can be accounted for by differences in firm characteristics and industry structure. There was no evidence that firms in the South West were more likely to regard the barriers listed in Table 3 as highly important in constraining their innovation activities compared with *comparable* firms in the South East. Rather, the South West pattern appears to be fully explained by the different characteristics of the region’s business stock – in particular with regard to the size distribution of businesses and industry structure.

Inactive Firms

The UK Innovation Survey asks inactive firms why they did not engage in innovation activities. Three basic reasons are given: that there was no need to innovate because of the firm’s prior innovations; because there was no need due to market conditions; and because of constraints on innovation activity. Table 4 compares firms in the South West with those in the UK as a whole and those in the South East in terms of the reasons given for inactivity by non-innovating firms. South West firms were less likely to give any of these reasons for not innovating than were firms in the UK, but were more likely to state that there was no need for innovation than were firms in the South East. Once again, econometric analysis suggests that these differences can be explained by differences in firm characteristics between the South West and other parts of the UK, particularly in relation to business size, industry, and exposure to nation and export markets.

Table 4: Reason for inactivity

% of firms rating reasons as highly important, South West vs. UK and South East

	SW vs UK	
	UK	SE
No need due to prior innovations	-	+
No need due to market conditions	-	+
Factors constraining innovation	-	-

Source: Authors' calculations based on UK Innovation Survey, 2005

POLICY SUPPORT FOR INNOVATION

The UK Innovation Survey provides information on whether firms received public policy support for innovation from regional bodies, national government or the EU. This can provide a basis for an analysis of whether the receipt of public support is associated with improved innovation performance and, if so, the size of this effect.

Econometric analysis of the Innovation Survey data shows a significant positive relationship between public support for innovation and innovation performance. Firms that have received public support are more likely to have engaged in all forms of innovation activities, are more likely to have introduced innovative products, processes and wider innovations, and are more likely to report business benefits associated with their innovation activities, than are firms that did not receive such support.

Table 4: Public support for innovation

% of firms receiving public support, South West vs. UK and South East

	SW vs.	
	UK	SE
Local or Regional Support	-	+
Central Government Support	-	-
Of which tax credits for R&D	+	-
EU Support	+	+
Of which EU R&D Framework Programme	+	-

Source: Authors' calculations based on UK Innovation Survey 2005

Table 5 indicates that firms in the South West were less likely to have received public policy support from UK institutions (local, regional or national) than were firms elsewhere in the UK. South West firms were, however, more likely to receive EU support for innovation. South West firms were also more likely to receive innovation support from local or regional institutions than were firms in the South East of England. A range of firm level characteristics are associated with receipt of public support for innovation. Allowing for differences in these characteristics, South West firms are less likely to receive most forms of public support for innovation than are equivalent firms elsewhere. The exception is EU support, where South West firms are more likely to receive such support than are equivalent firms in other UK regions, including those in the South East.

SCENARIOS

Information & Collaboration

Scenario 1: Use of external knowledge sources and collaboration on innovation among South West rises to match levels for firms in the South East.

This scenario investigates the implications of South West firms making greater use of external sources of information and collaboration on innovation activities. The result is to improve innovation outputs among South West firms. We focus on the impact of these changes on the share of turnover from innovative products, taken as a summary measure of the impact on product innovation (this therefore neglects other impacts of process and wider innovations). By increasing their use of external information, and by engaging more extensively in collaborative innovation activities, firms in the South West are predicted to increase the share of their output due to innovative products, although the effects are fairly modest. The share of revenue coming from 'significantly improved' and 'new to enterprise' products rises by around 0.18 percentage points, while the share from 'new to market' (i.e. novel) products rises by around 0.19 points. As noted in the companion paper, increases in the share of revenues to innovative products are associated with improved productivity and with more rapid growth in employment, productivity and output. The implications of these effects under this scenario are, however, small. Output (GVA) from the South West economy is predicted to expand by around 0.3% by 2015, or around £470 million. This comprises a 0.2% increase in employment (around 4,800 additional jobs) and a 0.1% increase in productivity.

Scenario 2: Use of external knowledge sources and collaboration on innovation among South West rises to match levels for *similar* firms in the South East (controlling for firm-level determinants of knowledge networking and collaboration).

As for scenario 1, this tends to expand innovation among South West firms, but with only minor impacts on total output, employment and productivity. The share of revenue coming from 'significantly improved' products actually falls under this simulation by around 0.11 percentage points, while that from 'new to enterprise' and 'new to market' products rises by 0.04 and 0.25 points, respectively. The net impact is to increase GVA in the South West by around 0.2% relative to our baseline projection by 2015, while employment rises by around 0.11% and productivity, similarly, by 0.11% by that time.

Public Support for Innovation

Scenario 3: Receipt of public support for innovation among South West changes to match levels for firms in the South East.

We noted (in Table 4, above) that South West firms are more likely to receive public support for innovation from both local and EU sources than are firms in the South East, but are less likely to receive support from national sources. Removing all of these differences by equating the levels of public support from all sources in the South West and South East actually implies a marginal decline in innovation performance among the South West's firms (as measured by the shares of revenues from innovative products). The share of revenues from 'significantly improved' products falls by around 0.03 points, that from 'new to enterprise' products is unchanged, and that from 'new to market products' declines by around 0.04 points. These changes are, however, very small, and are predicted to have little impact on business performance in the region.

Allowing the South West to maintain its current position in terms of public support for innovation from local and EU institutions, but closing the gap in support from national government with the South East, tends to expand innovation activity and improve business performance. In that

case, the effect is to raise the shares of revenue from innovative products, supporting gains to productivity and growth. These effects are, however, very small. Total South West GVA is predicted to increase by around 0.02% over the baseline projection by 2015, roughly evenly split between additional employment growth and higher productivity.

Scenario 4: Receipt of public support for innovation among South West changes to match levels for *otherwise similar* firms in the South East (controlling for firm-level determinants of receipt of innovation support).

Closing the ‘unconditional’ gap in public policy support for innovation between the South West and the South West has relatively minor (positive or negative) impacts on economic activity in the South West. The discussion on page 6, above, indicated that South West firms are relatively unlikely to receive public support for innovation from local and national governments, than are *otherwise similar* firms in the South East, but are more likely to secure support from EU sources. Our simulations suggest that closing this ‘conditional’ gap in public support would have more significant implications for innovation activity and for economic performance. Closing the gap for all sources of public support would, we predict, raise the share of revenues to South West firms from innovative products (by 1.4, 1.9 and 1.3 percentage points for significantly improved, new to enterprise and new to market products, respectively). This would result in an expansion in GVA in the South West by around 2.6%, or £3.9 billion in nominal terms, above the baseline projection by 2015. Employment would rise by around 1.6% or 41,000 jobs above the baseline by that time, and productivity would increase by around 1.0%.

Table 5: Summary of simulation results

	Impact by 2015 (% increase over base)		
	Employment	Productivity	Output
Scenario 1	0.18%	0.14%	0.32%
Scenario 2	0.11%	0.11%	0.21%
Scenario 3	-0.05%	-0.01%	-0.06%
Scenario 4	1.56%	1.07%	2.63%

INNOVATION ACTIVITY & SPILLOVERS

The above results have concentrated on levels of innovation activity within firms located within the South West, compared to other parts of the UK, and with the role of information networks, collaboration, barriers to innovation, and public support for innovation in influencing innovation performance. The results suggest that information networks, collaboration and public support have a positive role in supporting innovation at the level of individual firms. Firms that acquire information from external sources, those that collaborate on innovation activities, and firms that receive public support for innovation are more likely to innovate and to enjoy the benefits from innovation than are other firms. The analysis in the companion bulletin, *Innovation & Productivity 1*, also shows that higher levels of innovation activity are generally related to superior business performance in terms of productivity, output and employment growth. We might therefore expect stronger innovation performance – either more innovating firms or greater innovation activities among innovating firms – to be associated with stronger economic regional economic performance.

The research literature on innovation and performance also emphasises another avenue through which higher levels of innovation activity may benefit regional economic performance – through external benefits from ‘knowledge spillovers’. The argument here, for which there is substantial empirical evidence, is that by engaging in innovation activities (or knowledge generation) themselves, firms increased their ability to benefit from innovation activities within other firms. This literature emphasises that knowledge is ‘non-rivalrous’ and partially ‘non-excludable’. This means that innovating firms cannot keep the new knowledge they generate entirely to themselves, but expand the stock of useful knowledge available to all firms. The

ability of other firms to make use of this new knowledge (their 'absorptive capacity') depends on the extent to which they are linked into knowledge networks (their access to external information) and on their ability to process and exploit this knowledge (a function of the skills of their workforce and their familiarity with the current state of the art). It has been argued that engagement in innovation activities is itself a key determinant of a firm's ability to make productive use of knowledge generated by other firms.

The presence of knowledge spillovers associated with innovation activities is an important basis for public support for innovation activities. If firms were able to keep all of the benefits from their innovation efforts (R&D, etc.) to themselves, then their investment in innovation would fully reflect the benefits associated with those activities. This would, it argued, leave little justification for public support for innovation – firms that invest in innovation benefit from that investment and, from the point of view of society as a whole, overall investment in innovation should be at the level justified by the benefits derived from innovation. In the presence of knowledge spillovers, however, innovating firms do not capture all of the benefits from their activities – some benefits accrue to other firms. In this case, without public support, firms may invest less in innovation than is justified by the social benefits from innovation (higher productivity, etc.). Public support may be required to raise innovation activities towards their socially 'optimal' level. The geographical scope of knowledge spillovers is also of fundamental importance to the justification for public support. The case for local support is stronger if knowledge spillovers are highly localised – accruing primarily to local firms. The available empirical evidence on spillovers is, however, generally focused on higher geographical scales than are relevant for the South West (e.g. on knowledge spillovers within and between countries). It is, therefore, not possible to conclude whether public support for innovation is justified on a regional basis in terms of market failure or other efficiency arguments.

CONCLUSIONS

Innovation is the main driver of long run economic growth and prosperity. Understanding innovation is therefore a key requirement for understanding the growth process, and for designing policies to support that process. The South West economy performs relatively poorly with respect to its overall level of productivity compared with other UK regions. Firms in the South West also have relatively low levels of innovation activity compared to firms in the UK as a whole and in the South East, the strongest performing UK region in this respect.

A companion bulletin to this one (*Innovation & Productivity 1*) examines the innovation performance of firms in the South West, comparing them with firms in the South East. It presented the results of simulations that examined the potential impact on the South West economy of improvements in innovation performance – related to an expanded role for innovative products among all firms.

This bulletin focuses on three aspects of innovation that are particularly important for policy: the role of information networks and collaboration in supporting innovation activities and outputs; the barriers perceived by firms as limiting their innovation activities and/or the results of those activities; and receipt of public policy support as a determinant of innovation performance.

External information sources and collaborative innovation activities are both supportive of improved innovation performance. In general, firms in the South West make less use of information networks than do firms in the South East. They are less likely to value external sources of information and are less likely to collaborate in their innovation activities. These differences can, however, largely be explained by differences in firm characteristics between the two regions.

Innovation active firms in the South West are more likely to report a range of barriers as being highly important in constraining their innovation than are active firms in the South East. This

does not appear to be explained by the 'revealed barriers' mechanism, by which active engagement in innovation opens firms' eyes to the presence of barriers that they would not otherwise have identified. Inactive firms in the South West are less likely to identify barriers as important than are those in the South East. A plausible interpretation is that a greater share of the region's firms do not attempt to innovate – an interpretation that is supported by the larger share of the South West's inactive firms stating that they have 'no need' to innovate. Again, however, many of these differences can be explained by differences in firm characteristics between the two regions.

Firms in the South West were less likely to have received public policy support from UK institutions (local, regional or national) than were firms elsewhere in the UK. South West firms were, however, more likely to receive EU support for innovation. South West firms were also more likely to receive innovation support from local or regional institutions than were firms in the South East of England. There is strong evidence that public support for innovation is positively related to innovation activities, outputs and impacts.

Receipt of innovation support is biased towards firms that would be expected to have strong innovation performance even in the absence of support. South West firms are relatively disadvantaged in this respect and this partly explains the relatively low incidence of receipt of public support by the region's firms. Nevertheless, even allowing for differences in these characteristics, South West firms are less likely to receive most forms of public support for innovation than are equivalent firms elsewhere. The exception is EU support, where South West firms are more likely to receive such support than are equivalent firms in other UK regions, including those in the South East.

Our simulations suggest that increasing use of external knowledge by South West firms towards the levels seen in the South East, and similarly expanding the extent of collaborative innovation activities, would have only minor effects on innovation outputs and economic performance. Equalising public support for innovation between the South West and the South East would actually reduce innovation activity with detrimental effects on economic performance, although the effects here are very small. Our analysis suggest, however, that South West firms are less likely to receive public support for innovation from local and national sources than are firms in the South East, after allowing for firm-level determinants of innovation support. Removing this 'conditional' gap in public support would have a more substantial positive effect on innovation performance and economic activity in the region. This does not itself justify an expansion in public support – which should be based on detailed consideration of the costs and benefits involved, and particularly of the presence of knowledge spillovers. It may, however, suggest one area of policy where additional research may be warranted.

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SW BEM

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