



Analysis of TSB University Engagement Practices

A report by PACEC and the Centre for Business
Research to the Technology Strategy Board

April 2012

49-53 Regent Street
Cambridge CB2 1AB
Tel: 01223 311 649
Fax: 01223 362 913

email: admin@pacec.co.uk
www.pacec.co.uk

Contents

Executive Summary.....	i
X1 Introduction.....	i
X2 Aims and objectives of the project.....	i
X3 The approach and methodology.....	ii
X4 The survey of TSB staff.....	ii
X5 The survey of university staff.....	v
X6 The survey of businesses.....	vii
X7 The Key Direct Benefits to Businesses: Combined Views.....	ix
X8 Some suggestions on the way forward.....	ix
1 Introduction.....	1
1.2 Background and Project Aims.....	1
1.3 Defining interactions.....	3
1.4 The approach and methodology.....	3
1.5 Structure of the report.....	4
2 The Survey of TSB Staff.....	6
2.2 Transactional interactions with universities.....	6
2.3 Nature and scale of non-transactional interactions.....	7
2.4 Purpose of non-transactional interactions.....	12
2.5 Benefits to the TSB from non-transactional interactions.....	15
2.6 Benefits to the universities from non-transactional interactions.....	17
2.7 Benefits to business from non-transactional interactions.....	18
2.8 Additionality of the benefits realised.....	21
2.9 The time-opportunity cost of engagement.....	22
2.10 Constraints and improvements to effectiveness.....	23
2.11 The effectiveness of mechanisms in delivering benefits.....	23
2.12 Constraints to non-transactional interactions with universities.....	24
2.13 Improvements in support for non-transactional interactions.....	26
2.14 Summary of the Interviews.....	27
3 The Survey of University Staff.....	31
3.2 Nature and scale of non-transactional interactions with TSB.....	31
3.3 The benefits of interaction.....	38
3.4 Constraints and improvements to effectiveness.....	46
3.5 Summary of the Interviews.....	52
4 Survey of Businesses.....	55
4.2 The Aims of Non-Transactional Interactions with TSB and Universities.....	56
4.3 The Benefits to the Businesses of Interaction.....	58
4.4 The Constraints Faced by Businesses.....	60
4.5 Summary of the Interviews.....	60
5 Overall Conclusions.....	62
5.2 Interactions with universities and businesses.....	63
5.3 Non-transactional interactions with universities and businesses.....	63
5.4 The purpose of non-transactional interactions.....	64
5.5 Methods for non-transactional interactions.....	65
5.6 The benefits from non-transactional interactions.....	66

5.7	Additionality	68
5.8	Effective Non Transactional Mechanisms	68
5.9	The Key Direct Benefits to Businesses: Combined Views	68
5.10	Constraints and improvements to effectiveness	69
5.11	Some suggestions on the way forward	70

The Project Team

This report has been prepared by PACEC and the Centre for Business Research at the University of Cambridge on behalf of the Technology Strategy Board.

The project was managed by Rod Spires (Director of PACEC) with Tomas Ulrichsen and Matt Rooke (Assistant Directors) and Nii Djan Tackey (Senior Associate).

Professor Alan Hughes, Director of the Centre for Business Research at the University of Cambridge and Director of the Innovation Research Centre provided advice on the approach and methodology.

The Steering Group on the project comprised Emily Nott (Relationships Manager for the Public Sector) and Alyson Reed (Director of Enterprise and Communications) from TSB.

Our thanks are extended to the staff at the Technology Strategy Board, the universities and businesses who were interviewed and provided the evidence on which the analysis in the report is based.

Executive Summary

X1 Introduction

- X1.1 This report assesses the non-transactional interactions that the Technology Strategy Board (TSB) has with universities and how, and to what extent, these interactions support and stimulate innovation in business.
- X1.2 Universities are widely acknowledged as producers of cutting-edge knowledge and research across a range of disciplines that can influence innovation within business. They are, moreover, increasingly regarded as active collaborative partners in the innovation process.
- X1.3 TSB provides significant funding to support businesses in their interactions with universities. TSB staff also engage in a wide range of activities with universities, including TSB-funded programmes, networking events and informal exchanges of information.

X2 Aims and objectives of the project

- X2.1 A two-phase project was designed in order to fully assess the benefits of the interactions between TSB and university staff, and the impact of the interactions on innovation in business. The first phase focused on the perceptions of TSB senior managers and staff on the purpose and value of the interactions; and the second phase on the perceptions of universities and the businesses that they collaborate with.
- X2.2 The specific objectives of the first and second phases were as follows:
1. To understand the purpose of the TSB's non-transactional interactions with universities in helping them to support business innovation;
 2. Identify with which universities the TSB has relationships, and the nature of these interactions (including hierarchies of individuals and universities, and types of mechanisms);
 3. Define, and quantify where possible, how the relationships with universities help the TSB to stimulate innovation and benefit business, from the perspectives of both the TSB and universities;
 4. To understand what the outcomes have been, or are anticipated to be, from the interactions between TSB staff and universities; and what are the benefits for TSB, and the perceived benefits for business;
 5. Estimate the time and resource TSB is devoting to its non-transactional interactions with universities;
 6. Understand how the organisation of the relationships could be refined to enhance the value, reduce the cost and improve value for money to the TSB.
- X2.3 An interaction with a university is defined as any contact between a TSB staff member and a university in which there is exchange of knowledge, information or

data that relates to their role within the TSB. Interactions include formal or informal meetings, advisory work, email and telephone exchanges where knowledge is shared, and organisation and participation in joint events, workshops, seminars, and conferences. Within this broad range of activities, transactional interactions are defined as activities where the primary objective is to discuss a specific TSB project contract involving finance or funding. Non-transactional interactions are activities that are not directly related to specific TSB project contracts or funding.

X3 The approach and methodology

X3.1 The research was carried out through a series of integrated tasks:

- An inception meeting with TSB to scope out the project aims fully, identify background information, and agree the staff at TSB, likely to be engaged in non-transactional activities with universities, and with whom to consult
TSB staff also helped to identify a reasonable cross section of university and business contacts to interview (see below)
- A review of background information held by TSB, e.g. the University Portfolio analysis of funding
- Interviews with senior TSB staff to examine the issues, and pilot the approach for the planned survey
- A survey of TSB staff engaged in non-transactional university activities.
- A survey of university staff engaged in non-transactional TSB activities
- A small survey of businesses engaged in non-transactional activities with both the TSB and universities.

X3.2 The survey at the TSB achieved interviews with approximately 40 respondents, broadly representative of the cross-section of TSB staff, and including department heads. The survey of universities achieved interviews with approximately 43 senior and non-senior staff; and the survey of businesses achieved interviews with about 20 respondents who were predominantly senior staff engaged in research, development and commercialisation. The results from the surveys were analysed using SPSS; and the quantitative results were integrated with more qualitative information from the respondents on specific issues.

X4 The survey of TSB staff

X4.1 The research with TSB staff explored the nature and scale of their transactional and non-transactional interactions with universities, the mechanisms through which such interactions took place, and the motivations for the non-transactional interactions.

Transactional interactions with universities

X4.2 The TSB provides funding for a range of programmes which have universities as key partners. These include grants for Collaborative Research and Development (CR&D), Knowledge Transfer Partnerships (KTP), Catapults, and Knowledge Transfer Networks (KTN).

X4.3 Interactions between TSB and university staff are an important part of the TSB's activities. A portfolio analysis undertaken by the TSB of its funding showed that 66% of the total current grant value involved research based partners (ie universities) or c£550m. The analysis also found that almost three quarters (72%) of the total grant funding involving universities (including CR&D, KTPs and Research Council contributions) was received by just 25 universities. The universities of Warwick, Cambridge and Birmingham received the highest amounts.

Nature and scale of non-transactional interactions

X4.4 The TSB staff had their widest networks with researchers and academics, rather than with more senior university staff (such as vice-chancellors), or with staff involved in technology transfer. More than half (55%) indicated they had non-transactional interactions with between 5 and 19 researchers or academics during the last year. A similar proportion (56%) had non-transactional interactions with between one and nine technology transfer and commercialisation staff at universities.

X4.5 There was some difference between TSB heads of department and other staff about the type of university staff they engaged with. Almost two-fifths of non-heads (37%) did not engage with senior university staff at all, whereas all department heads did. The discussions between TSB department heads and senior management in universities tended to focus more on TSB overall strategy and aims, rather than the individual programmes.

X4.6 For all TSB staff, however, their most frequent contacts at the universities were, in order of scale, with academic researchers, knowledge transfer staff, senior researchers, and senior management. TSB staff also engaged more frequently with staff in university departments engaged in STEM disciplines – engineering, life sciences, computer sciences, communications and mathematics.

X4.7 The bulk of the TSB staff non-transactional interactions in the past year was with academics and staff from research intensive universities. Cambridge University topped the list, with almost 10% of total contacts, followed by Bristol (7.8%) and Edinburgh (7.8%).

Mechanisms and methods for non-transactional interactions

X4.8 Departmental heads engaged more frequently in non-transactional interactions than non-heads; an average of 65 interactions over the past year for heads, compared with 29 for non-heads.

X4.9 As might be expected, email and telephone exchanges were the most frequently used means of engagement for all TSB staff, followed by attendance at conferences, events and workshops. There was some difference between heads and non-heads. Departmental heads were significantly more likely than non-heads to attend either one-to-one meetings with university staff, or meetings with both university and business staff present.

X4.10 Non-transactional interactions between TSB and university staff were initiated in different ways. Direct contact initiated by university staff, and mutual contact via informal meetings at events, were the most important (or most frequent?) means of starting any interaction in the first place.

X4.11 The in-depth interviews with selected TSB staff also revealed that the research councils sometimes helped to identify relevant university contacts for TSB. Indeed, TSB staff often approached the research councils to ask them to invite the top academics in particular areas of interest to a workshop or other such event.

The purpose of non-transactional interaction

X4.12 The main motivation for the TSB staff in the survey to engage in non-transactional interactions appeared to be their wish to enhance the role that the organisation plays in brokering relationships and collaborations between universities and businesses. More than four-fifths (85%) cited this as 'very important' or 'critical'. Almost as important was their desire to help academics understand the needs of business in the commercialisation of innovation and technology (82%), and to increase awareness of TSB and its programmes of funded research (80%).

X4.13 There was considerable difference between department heads and other staff over the importance of non-transactional activity in improving decision-making at the TSB. Department heads (45%) were significantly more likely than non-heads (5%) to consider that the interactions with university staff could be useful in co-opting expert views in order to improve decision-making at TSB.

X4.14 The in-depth interviews with senior TSB staff further highlighted their desire to use the non-transactional interactions to communicate the strategic role of TSB in assisting businesses to be more competitive and to commercialise the outputs from research and development in universities. This was considered to be particularly important for the government's growth agenda.

The benefits from non-transactional interactions

X4.15 The TSB staff perceived benefits from non-transactional interactions to accrue to the TSB, the universities, and to businesses. There were four main benefits to the TSB from the interactions. Firstly, the organisation benefited from developing a more co-ordinated and strategic approach to policy-making with BIS and the Research Councils. Second, TSB would have a better understanding of the key trends and impact of research. Third, the interactions enabled TSB understand better the research needs of universities; and fourthly, they would help refine the scope of TSB programmes.

X4.16 The TSB perception was that by far the most significant benefit to universities was helping them understand what funding was available from the TSB. The other important impacts were considered to include: helping to improve the culture among universities towards engaging with business; helping them understand nationally

important areas of research; and helping universities gain a better understanding of the needs of business.

X4.17 The TSB staff considered that there were benefits to business from non-transactional interactions, with four standing out in particular. First, businesses could be helped to find appropriate research partners in higher education institutions. Second, businesses themselves could access new ideas and gain different perspectives. Third, university research could be made more relevant for commercialisation, which in turn would lead to business growth. Fourth, research in universities would be better targeted to businesses.

X4.18 The evidence from the survey suggests that most of the TSB believed these benefits would not have been realised in the absence of the non-transactional interactions.

Constraints to non-transactional interactions

X4.19 The survey showed that the main constraint to non-transactional interactions was the lack of time for TSB staff to fully engage with universities. The interviews with senior staff in particular indicated that they found interactions quite time-consuming and difficult to maintain, if they were to be effective. Time constraints were, similarly, considered to hinder the ability of university staff to fully engage with TSB. However, there were constraints other than lack of time. In particular, there appeared to be lack of co-ordination of between TSB staff, leading to duplication on one hand, but on the other hand, difficulty in identifying appropriate university staff.

X5 The survey of university staff

X5.1 The research with university staff (that were identified by TSB staff and the universities themselves) explored the nature and scale of their transactional and non-transactional interactions with TSB, the mechanisms through which such interactions took place, and the motivations for the non-transactional interactions.

Nature and scale of interactions with TSB

X5.2 The university staff considered their interactions with the TSB to be very important, and only a few had not engaged with TSB staff at all during the intervening year. Indeed, some had almost weekly contact with TSB staff, and had more than 50 non-transactional interactions over the course of the year. Senior staff were more likely than non-senior staff to engage with TSB staff, mainly because they were the project leaders for programmes and other associated activities which give rise to interaction in the first place.

Purpose of non-transactional interactions

X5.3 The majority of the university staff hoped that their contact with TSB staff would give them a better insight into TSB's research priorities. They considered this to be important for developing proposals for TSB programmes and funding. On the whole,

though, the university staff appeared to be motivated more by making their research better known, and less about the commercialisation of their research. Fewer than half of them were looking for business partners to collaborate with in knowledge exchange.

Methods for non-transactional interactions

- X5.4 The university staff regarded the direct contact they initiated themselves as the most important means of starting any engagement with TSB staff. A sizeable proportion also cited the importance of contact coming the other way, ie contact initiated by TSB staff. Senior staff in particular believed that contacts initiated by them were the most fruitful in producing benefits.
- X5.5 The evidence also indicated there was frequent contact between university staff and businesses, although this appeared to be conducted between non-senior staff and representatives of business. Non-senior staff were more inclined than senior staff to consider referrals from business as very important for starting engagement with TSB staff. Mutual contact, often informal meetings at events, fell somewhere in-between the two types of direct contact.

Mechanisms for non-transactional interactions

- X5.6 Apart from email and telephone exchanges, the university staff tended to favour one-to-one meetings with TSB staff only as an important mechanism of engagement with TSB staff. This was followed by conferences and other events, and meetings where representatives of business were also present. Non-senior staff in particular appeared to favour this means of interaction more than senior staff.

Benefits of interaction

- X5.7 The survey showed that the university staff valued their relationship with TSB highly. Almost half of them (47%) claimed that their contacts with TSB staff were important for their overall research and knowledge exchange work. They also believed that their university benefited directly from the interactions with TSB staff. They perceived wide-ranging benefits, including: improving their understanding of TSB funding available for research (86%); improving their knowledge of key research areas of national importance (84%); improving their ability to apply for TSB funding (83%); and improving their understanding of TSB innovation policies (81%). In addition, there was a better understanding of TSB innovation policies and any uncertainties surrounding funds (some three quarters for each) while some two thirds of university staff thought the interactions helped them improve their culture for engaging with businesses, identify business partners, and understand the needs of businesses.
- X5.8 The university staff considered that the benefits flowed in different directions, in the sense that the other stakeholders benefited just as significantly from the non-transactional interactions. The benefits they perceived flowed to the TSB in particular were: improving their understanding of the key trends and impacts of current

university research (78%); understanding the research commercialisation needs of higher education institutions (73%); and helping the TSB refine the scope and direction of its programmes (71%). Again, these were remarkably similar to the views of the TSB staff themselves about the benefits of interaction to their organisation.

X5.9 The benefits to businesses, as perceived by university staff, from the non-transactional interactions included: their accessing new ideas and gaining perspectives across a wide range of new subject areas. As well, businesses were thought to benefit from having their needs better targeted by research being undertaken in universities. Even more importantly, the interactions have enabled businesses to find appropriate collaborative partners in universities. The overall effect was that university research was becoming more relevant for commercialisation and business growth. It is notable that here too, the views of the university staff appeared to corroborate the evidence from the research with TSB staff, about the benefits of non-transactional interactions to business.

X5.10 On the whole, the university staff believed that the biggest beneficiary of the non-transactional interactions was the TSB itself. More specifically, half of the university respondents (51%) believed the benefits accruing to the TSB would probably or definitely not been realised on the absence of the interactions. This compares with around two-fifths (42%) who did not think the benefits to universities would have been realised; and exactly one-third (33%) who did not think the same about the benefits to business.

Constraints and improvements to effectiveness

X5.11 The university staff did not face significant constraints when interacting with TSB staff. On the contrary, they were acutely aware of the overall benefits from the interactions, and about the willingness of TSB staff to engage with universities. They also had considerable support from their own universities to engage with the TSB. The major constraint they identified related to time availability, particularly as they had to fit the interactions into their teaching and other academic responsibilities. This often made it difficult for them to fully engage with TSB staff. The only other areas of concern related to difficulties in identifying and making contact with the appropriate TSB staff.

X6 The survey of businesses

X6.1 This report was to assess the non-transactional interactions that the Technology Strategy Board (TSB) has with universities and how, and to what extent, these interactions support and stimulate innovation in business. The following paras look at non transactional relationships businesses have with TSB and unis and less at the impact of TSB's interactions with universities on business.

X6.2 More than half of the businesses included in the survey were independent businesses with no subsidiaries. One in five were independent businesses with subsidiaries, and the rest were subsidiaries of UK and overseas-owned companies. The businesses were at different stages of maturity, with a mix of mature and long-established firms and young, more recently-established ones.

Purpose of non-transactional interactions

X6.3 The businesses were keen to develop their relationships with higher education institutions. Four-fifths (80%, ie 12 out of 15) sought to use the opportunity offered by their non-transactional interactions with the TSB to make universities better aware of research being carried out by businesses themselves. Around half (53%) hoped to find out more about the research priorities of universities, and an identical proportion (53%), to find out more about the opportunities for TSB funding.

Methods for non-transactional interactions

X6.4 Almost all the businesses indicated that email and telephone exchanges were their primary means of engaging with TSB and university staff. However, most of the businesses indicated they had face-to-face meetings with university staff only (ie with no TSB staff present), in preference to such meetings with TSB staff only. Indeed the meetings with university staff only was the main mechanism for business engagement in non-transactional interactions. Despite these differences, the majority of the businesses found most of the mechanisms for engaging with TSB and university staff quite effective.

Benefits of interaction

X6.5 The businesses regarded their interactions with TSB and university staff as important, with interactions with university staff considered marginally more important. The businesses identified three principal benefits from their non-transactional interactions. Most believed that businesses had gained new ideas and perspectives in different disciplines as a result of the interactions. A substantial number also thought that TSB research priorities had become clearer and focused on business needs, and thus encouraged research in universities to become more relevant for commercialisation. Last, the businesses had benefited by finding appropriate research partners in universities, which in turn had helped improve business culture towards engaging with universities and academics.

X6.6 The majority of businesses (where they could express a view) believed that the benefits would not have been realised in the absence of the non-transactional interactions.

X7 The Key Direct Benefits to Businesses: Combined Views

X7.1 An important aim of the project is to draw out the benefits to businesses and their innovation activities that arise from the non-transactional interactions. The direct benefits to businesses that were identified by them were:

- They could access new ideas across different disciplines / fields (in TSB and the universities)
- TSB research was targeted more on business needs
- HEI research was geared more towards commercialisation and business growth
- Collaborative research partners were easier to identify in universities reflecting the brokerage role of TSB
- The university culture in terms of working with businesses was improved

X7.2 In combination these impacts improve the innovation activities of businesses and their ability to commercialise products and services.

X7.3 The TSB staff also identified these points, and in particular the ability of businesses to find appropriate research and collaboration partners which reflects the TSB brokerage role. The universities also highlighted these impacts. They also thought that businesses were better placed to overcome innovation and technology issues (ie find solutions) and improve their innovation skills and practices.

Constraints faced by businesses

X7.4 The business contacts recognised that the overall aims of TSB and university staff could be different to the commercial aims of businesses. They also faced constraints in terms of their time in a context where they could have fewer staff and could be overtaken by other priorities and “events” such as revenue, sales and marketing issues and supplier arrangements. Sometimes the non-transactional activities were more general, did not involve specific opportunities and related to more medium term issues. It could take time to set up TSB / university activities where all faced time and resource pressures.

X8 Some suggestions on the way forward

X8.1 The analysis has highlighted the key benefits of the non-transactional engagement with universities as well as raising some issues about the reservations of some TSB, university and business staff, and the constraints faced. The views give some indication of adjustments that could be made at both the strategic (policy) and operational levels for TSB to improve the outputs of the non-transactional activities and the inter-relationship with the main TSB programmes.

The strategic level

X8.2 TSB should give some priority, and take steps to ensure:

- Greater clarify as to the aims of the non-transactional activities for all partners, especially in a context where the TSB's strategic aims have been re-shaped / are being developed to reflect overall government priorities and growth aims.

These changing government and TSB priorities will also have implications for the universities and businesses and the non-transactional interactions with them.

- Provide a clearer picture of the business benefits being sought through the non-transactional activities and link these to the aspirations of businesses.
This project has identified what they are considered to be. However, they need to be communicated to TSB staff, businesses, and universities.
- Spell out the interrelationship between the non-transactional activities and the programme or portfolio activities that are particularly important for the universities and businesses:
 - The networking role of non-transactional activities; the market intelligence and technology / opportunity awareness role (for business and university opportunities) and developments, communications, the building of interpersonal relationships, the awareness raising role, the contribution to knowledge exchange, and the brokering activity between universities and businesses.
 - The "reach" of non-transactional activity, i.e. in building links with universities that receive less of the programme funding, or activity but provide expertise in key areas where there may be niche and emerging opportunities for businesses.
 - The interface between the non-transactional and the programme activities. The interrelationships between the two and their respective functions and the priorities between them for staff.
 - How and when TSB should take the initiative in engaging with universities. For example, policy changes, challenges, and new opportunities. These more strategic aims could be communicated to both university and business partners more effectively.

The operational level for TSB staff

- Provide a clear direction of the responsibilities for non-transactional activity amongst the different levels of TSB staff and how they interrelate.
- Agree the outputs to be achieved for staff as targets. These may include the number and type of mechanisms / activities to engage in (say annually), the programme of engagement, and the outputs and outcomes to be achieved for TSB, the universities and businesses – with benefits attributed to the non-transactional activities.
- Agree the appropriate time inputs and resources for TSB staff appropriate to the outputs envisaged.
- Agree the most appropriate mechanisms for non-transactional activities and for different levels of staff, e.g. meetings with the universities, university / business meetings, events and conferences etc.
- Strengthen the internal CRM arrangements, mapping and database showing the university non-transactional activities and the referral routes across TSB and universities.
- Examine the requirement for staff development, briefings, best practice dissemination and training to improve interactions.
- Develop a monitoring system to take stock of activities and progress towards the outputs / outcomes and ultimate aims.

- Agree an overall budget for the activities as part of the annual planning process.
- Ensure that, reflecting the preferences of TSB staff, universities and businesses, non-transactional meetings are given priority where they involve the TSB, universities and businesses.

X8.3 The suggestions are given equal priority. A working group may be appropriate to consider the suggestions further. TSB is considering further research to assess the views of the universities and businesses which can feed into this process.

1 Introduction

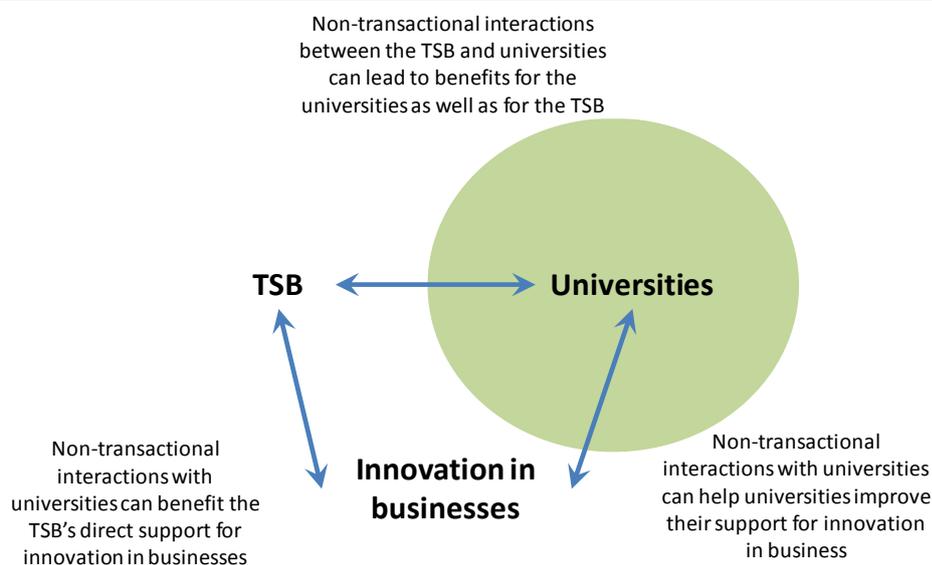
- 1.1.1 This report assesses the non-transactional interactions that the Technology Strategy Board (TSB) has with universities and how, and to what extent, these interactions support and stimulate innovation in business. Improving the understanding of the purpose and value of these interactions, and the major constraints that inhibit increased benefits being realised, will help the TSB develop a more robust strategy for managing these relationships and, as well, highlight the areas that need to be improved to increase their effectiveness.
- 1.1.2 In order to fully assess the benefits of these interactions and how they impact on innovation in business, a two-phase project was designed. The first phase focused on the perceptions of TSB senior managers and staff on the purpose and value of the interactions; and the second phase on the perceptions of universities and the businesses that they collaborate with. This report presents the findings from the first and second phases.

1.2 Background and Project Aims

- 1.2.1 Universities are increasingly recognised as an important part of the innovation system. They provide knowledge inputs into the innovation process through a wide variety of mechanisms, including contract research, expert advice, and engagement in collaborative innovation programmes. There is increased emphasis by governments on this specific role of universities, as they seek to stimulate innovation in business further, as part of the intended private sector-led recovery of the economy from the current recession.
- 1.2.2 Universities are widely acknowledged as producers of cutting-edge knowledge and research across a range of disciplines that can potentially influence the innovation process within business. But they are now also considered active, collaborative partners in the innovation process itself. Their engagement with business is increasingly recognised as extending beyond the traditional 'push' drivers of spin-outs and licensing, and the more scientific and technology focused disciplines.
- 1.2.3 The TSB provides significant amounts of funding to support businesses in their interactions with universities. For example, a recent analysis undertaken by TSB found that two-thirds (66%) of the total current portfolio of research and training commitments involve collaboration with universities. TSB staff engage in a wide range of activities with universities, including TSB-funded programmes, networking, events and informal exchanges of information. Many of these involve businesses, and are designed to strengthen the links between universities and businesses in order to produce mutual benefits related to innovation.
- 1.2.4 Figure 1.1 is a diagrammatic presentation of the interface and engagement between the TSB, universities and businesses, and illustrates the non-transactional inter-relationships between the three key stakeholders. These relationships are more

informal, and do not directly relate to finance and programmes. The overlapping segment in the centre of the circles shows where the three stakeholders come together on shared innovation issues. The non-transactional interactions between TSB staff and universities have the potential to benefit each of the key stakeholders.

Figure 1.1 The support for innovation through non-transactional interactions between the TSB, universities and businesses



Note: interactions in the segments do not indicate the scale of interaction. They are illustrative only
Source: PACEC

1.2.5 Against this background, the TSB commissioned Public and Corporate Economic Consultants (PACEC) and Professor Alan Hughes, Director of the Centre for Business Research, University of Cambridge (and also Director of the UK Innovation Research Centre), to assess its non-transactional activities with universities and how these interactions stimulate innovation and benefit business. The first phase of this project was intended to look at the purpose and value of the interactions from the perspective of the TSB. It is important to point out that TSB-university interactions take place within a system of knowledge inputs for innovation from a much wider range of knowledge producers, such as technology intermediaries and brokers, public sector research establishments, and other organisations. The focus here is on the benefits to businesses from TSB-university interactions, and whether and how these could be improved. Within this context the project has the following overall objectives:

- To understand the purpose and value of non-transactional interactions between the Technology Strategy Board and universities which help the TSB to support innovation in businesses
- To define how the interactions with universities help the TSB to stimulate innovation and benefit businesses
- To identify which universities the TSB has the interactions with, and the nature of the interactions, both non-transactional and transactional

- To understand the nature and scale of the outcomes from the interactions between TSB staff and universities, and the benefits for the TSB and businesses
- To estimate the amount of time and resource the TSB is investing in non-transactional interactions with universities
- To understand how universities benefit from direct dialogue with the TSB.

1.2.6 In addition, the research aimed to inform the TSB about how the relationships between its staff and universities could be developed to help it meet its aims and improve the benefits for businesses, in particular:

- The extent to which TSB should develop its support for non-transactional interactions with universities
- How TSB could ensure it obtains greater value from such interactions.
- At what level TSB should focus its engagement with universities, and with which types of staff.

1.2.7 The project was carried out in two phases. The first phase focused on gathering evidence from within the TSB. It was planned that this would be counter-balanced by evidence from the second phase interviews with the TSB's university partners and collaborating businesses. In this way it was possible to prevent optimism bias arising from overestimation of the value of the relationships by TSB staff, and at the same time capture the important benefits to the universities and businesses arising from these relationships.

1.3 Defining interactions

1.3.1 It is important to understand what is meant by transactional and non-transactional interactions in this report. First, an interaction with a university is defined as any contact between a TSB staff member and a university in which there is exchange of knowledge, information, or data that relates to their role within the TSB. Interactions could include, for example, formal or informal meetings, advisory work, email and telephone exchanges where knowledge is shared, and organisation and participation in joint events, workshops, seminars, and conferences. Within this broad range of activities, transactional interactions may be defined as any activity where the primary objective is to discuss a specific TSB project contract involving finance or funding (e.g. CRD, GRD, KTP, TIC). Non-transactional interactions, on the other hand, are activities that are not directly related to specific TSB project contracts or funding.

1.4 The approach and methodology

1.4.1 The research was carried out through a series of integrated tasks:

- An inception meeting with TSB to scope out the project aims fully, identify background information, and agree the staff at TSB, likely to be engaged in non-transactional activities with universities, and with whom to consult
- A review of background information held by TSB, e.g. the University Portfolio analysis of funding

- Interviews with senior TSB staff to examine the issues, and pilot the approach for the planned survey
- A survey of TSB staff engaged in non-transactional university activities.
- A survey of university staff engaged in non-transactional TSB activities
- Consultations with businesses engaged in non-transactional activities with both the TSB and universities.

1.4.2 The survey at the TSB achieved interviews with approximately forty respondents, who were reasonably representative of the cross-section of all TSB staff. The survey of universities also achieved interviews with approximately 43 senior and non-senior staff. The potential interviewees were selected following liaison with TSB and the universities. The business consultations were smaller in number, and achieved interviews with some eighteen respondents with fifteen responses that were usable in full. The business contacts were selected in liaison with TSB staff and the universities and included some businesses who were known to be involved in some TSB programmes¹. The results from the surveys were analysed using SPSS. The quantitative information was integrated with the more qualitative views of the different respondents on some of the issues.

1.4.3 The analysis of the interviews with the TSB covered the views of all TSB staff, and the aggregate results were weighted to reflect the overall population of staff. . The data was also disaggregated for Heads of Departments and Non-Heads at TSB. The data from the survey of universities and businesses were analysed straightforwardly, unweighted. The results of the surveys are reported in aggregate form mainly for all respondents, but they are broken down by specific groups (e.g. heads and non-Heads at TSB, and senior and non-senior staff at universities) where appropriate, or where their views differed significantly.

1.5 Structure of the report

1.5.1 The chapters that follow this introduction report the findings from the different surveys. Chapter 2 presents the findings from the interviews with TSB staff; while chapters 3 and 4 report the findings from the surveys of university staff and businesses, respectively. As much as possible, the chapters are structured in an identical way, with individual sections exploring:

- the nature and scale of the interactions between the TSB, universities and businesses, including both transactional and non-transactional;
- the motivations of TSB, university and business staff for carrying out non-transactional interactions;
- the perceived benefits that the respondents believe are realised by the key stakeholders from the non-transactional interactions - the TSB itself, as it seeks to fulfil its objectives; and the universities and businesses, as they seek to innovate;

¹ TSB. Evaluation of the Collaborative Research and Development Programmes – Final Report. PACEC.

http://www.innovateuk.org/_assets/pdf/publications/pacec_evaluation_of_crandd_report.pdf

- the constraints and effectiveness of the non-transactional interactions, and how these may be improved to ensure better and more effective support for innovation in business.

1.5.2 Chapter 5 summarises the results from the surveys, draws some conclusions from the evidence, and makes suggestions on the way forward at both strategic (policy) and operational levels.

2 The Survey of TSB Staff

2.1.1 This chapter focuses on understanding the nature and scale of the transactional and non-transactional interactions between the Technology Strategy Board and universities. It begins by looking at the scale of transactional interactions that the TSB has with universities, in particular the scale of funding distributed and the types of universities in receipt of TSB funds. It then moves on to focus on the non-transactional interactions, including exploring the types of individuals TSB staff have such interactions with, and the mechanisms through which they interact. Some attention is also given to how these interactions are initiated. The chapter concludes by looking at the types of individuals and universities with whom TSB staff have most frequent interactions.

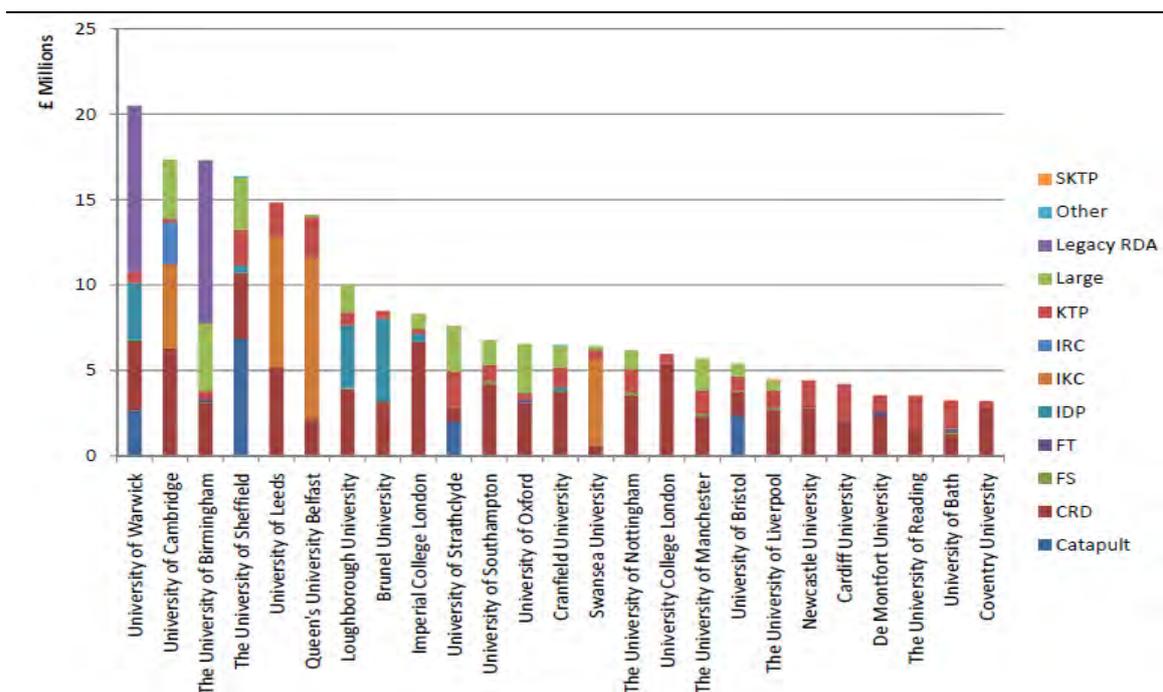
2.2 Transactional interactions with universities

2.2.1 The Technology Strategy Board provides a range of funding programmes which have universities as key partners. These include grants for Collaborative Research and Development (CR&D) the Knowledge Transfer Partnerships (KTP), the Catapult Innovation Centres (TIC), and the Knowledge Transfer Networks (KTN), all funded by the TSB.

2.2.2 Analysis undertaken by the TSB of its funding shows that two-thirds (66%) of the total current grant value involves research base partners (ie universities). This amounts to approximately £550 million.

2.2.3 The TSB analysis also found that 72% of the total grant funding involving universities (including CR&D, KTPs and Research Council contributions) was received by just 25 universities. These are shown in Figure 2.2 below. The University of Warwick received just over £20m on live projects, followed by the Universities of Cambridge and Birmingham, each with some £17m. Within the top twenty five funded universities, the Universities and Bath and Coventry received some £3.5m each from TSB.

Figure 2.2 Top 25 universities by total grant value received through TSB on live projects



Source: TSB (2011) *Technology Strategy Board. Board Paper 2012*

2.3 Nature and scale of non-transactional interactions

2.3.1 The survey of TSB staff found evidence of a relatively dense network of non-transactional interactions with different types of university staff.

Types of university staff in the network

2.3.2 In terms of non-transactional interactions the TSB staff, typically, appeared to have their widest networks with researchers and academics, rather than with more senior university staff (e.g. VCs) or the technology transfer staff. More than half (55%) claimed they had non-transactional interactions with 5-19 researchers or academics over the past year. An almost identical proportion (56%) indicated they had had non-transactional interactions with 1-9 technology transfer or commercialisation staff. There appeared to be much less interaction with senior management, although 42% had contact with 1-4 senior university management staff. It is notable that about 5% of TSB staff claimed they had had non-transactional interactions with 50 or more university staff.

2.3.3 There was a marked difference between heads of department and other staff in their levels of interaction with senior university management. Almost two-fifths (37%) of non-heads had no interactions with senior university management, whereas all department heads had interacted with at least one member of senior university management; and a fifth (20%) had interacted with 50 or more. The in-depth interviews also suggested that where department heads tended to engage with senior management at universities (e.g. VCs and PVCs); their discussions focussed more

on the TSB overall strategy and aims rather than individual programmes and “toolkits”, except where university staff had direct responsibility for them.

Table 2.1 Number of people TSB staff have had non-transactional interactions with in universities, by types of HE staff

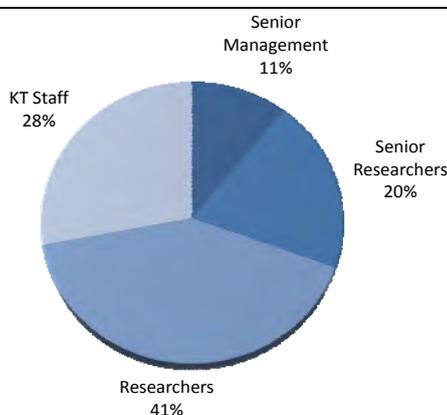
Number of people	Percentages of all respondents		
	Senior university management	Researchers / academics	Technology transfer / commercialisation staff
0	28	4	2
1-4	42	7	34
5-9	17	20	22
10-19	2	35	23
20-34	6	13	8
35-49	0	11	0
50+	5	10	11
<i>Number of respondents</i>	29	32	30

Source: PACEC Survey of TSB staff 2011

2.3.4 The survey of TSB staff also probed them about their top five most frequent university contacts over the past year. This provides evidence on those universities and individuals the TSB has most frequent contact with. Across all TSB staff, the most frequent contact was with academic researchers, followed by KT staff, senior researchers (such as heads of departments and research centres), and then senior management of universities. However, given the small percentage of total academic staff that senior management make up, the evidence appears to suggest that TSB staff were making a particular effort to target this group.

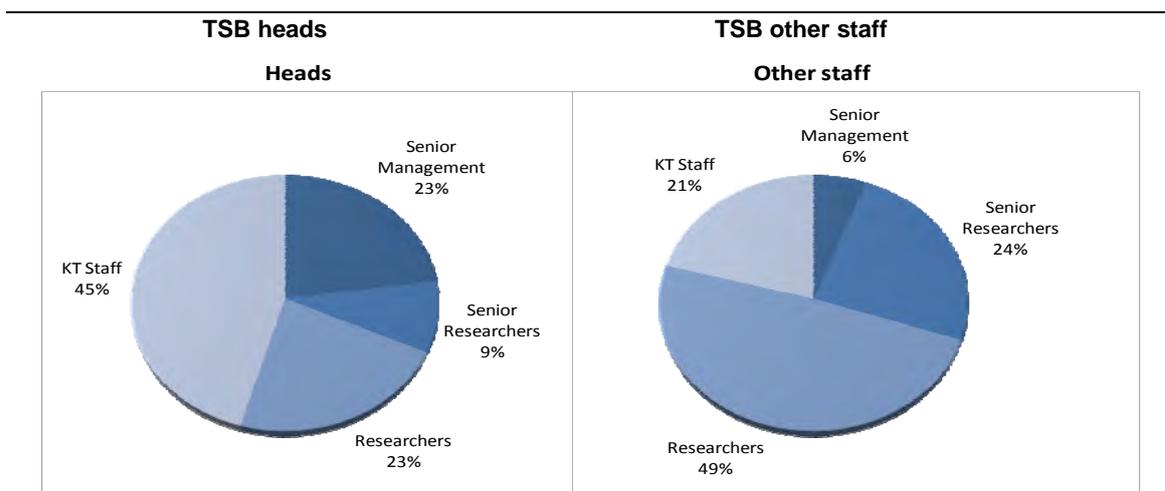
2.3.5 The list of frequent contacts was heavily dominated by academic staff in engineering departments, followed by a mix of life sciences, computer sciences, communications and mathematics, reflecting the TSB’s emphasis on STEM subjects (science, technology, engineering and maths). They were followed by interactions in the other subject areas, including the social sciences and humanities.

Figure 2.3 Most frequent contact by position (percentage of all contacts, all TSB staff)



Source: PACEC Survey of TSB staff 2011

Figure 2.4 Most frequent contact by position (percentage of all contacts, Heads and Non-Heads)



Source: PACEC Survey of TSB staff 2011

2.3.6 The breakdown of the respondent TSB staff into heads of departments and other TSB staff indicated that KT staff make up almost half of the frequent contacts of TSB departmental heads, but only a fifth of other TSB staff contacts. Heads of departments were also much more inclined to be in contact with senior university staff(23% of frequent contacts compared with just 6% for other TSB staff). For non-heads, researchers made up almost half of their frequent contacts.

Universities in the network

2.3.7 The list of top 10 contactswith university staff in the past year provides us with a view about the universities that TSB staff were frequently engaging with. Unsurprisingly, many of these interactions were in research intensive universities; with 9.1% in the University of Cambridge, 7.8% in the University of Bristol and a similar proportion in the University of Edinburgh (Table 2.2). The top 10 universities accounted for 53% of the respondents on the list of contacts provided by TSB staff in the survey. As more than half of the contacts (53%) came from the top 25 universities, based on the amount of TSB funding received (Table 2.2), it is reasonable to assume that many interactions were happening outside the main universities in receipt of TSB funding.

Table 2.2 Top 10 Universities in TSB Most Frequent Contacts List

University	Share of All University Contacts	Rank based on total TSB funding received
University of Cambridge	9.1%	1
University of Bristol	7.8%	n/a
University of Edinburgh	7.8%	n/a
Imperial College London	5.2%	3
University of Nottingham	5.2%	11
University of Reading	5.2%	23
University of Surrey	5.2%	n/a
UCL	3.9%	7

University of Bath	3.9%	20
UEA	2.6%	n/a
Total for top 10	55.8%	

Source: PACEC Survey of TSB staff 2011

Mechanisms for non-transactional TSB-university interactions

- 2.3.8 The survey explored the range of different mechanisms through which non-transactional interactions between TSB and university staff took place. This covered meetings, conferences / events / workshops, appointments to advisory boards, secondments, and telephone and email exchanges. Staff were also able to identify other types of mechanisms. Overall, other than telephone and email exchanges, attendance at conferences, events and workshops were the most frequent types of mechanisms, with staff attending on average 13.1 per person in the past year. This was followed by meetings with university staff with no business present (11.6 per person) and meeting where both university staff and business were present (8.9 per person).
- 2.3.9 Departmental heads engaged more frequently in non-transactional mechanisms than non-heads. The heads of department participating in the survey had an average of 65.3 non-transactional interactions during the past year (excluding telephone or e-mail exchanges), compared with 29.3 for other staff. Departmental heads went to an average of 24.5 meetings with university staff with no business present, 17.2 conferences, events, or workshops, and 16.1 meetings with both business and university staff present.
- 2.3.10 The most common forms of interaction for non-heads were conferences, events, and workshops, with non-heads participating in 12.0 such events per year. As departmental heads are outnumbered by other staff in the population of TSB staff, the most common interaction mechanisms for staff on average throughout the population are also conferences, events, and workshops, with an average of 13.1 per year over all staff.

Table 2.3 Types of mechanisms TSB staff engaged in university staff for non-transactional interactions

	Average (mean) amount		
	Total	Head	Not Head
Meetings with university staff (no business present)	11.6	24.5	7.6
Meetings with both business and university staff present	8.9	16.1	7.0
Conferences / events / workshops:	13.1	17.2	12.0
Advisory board roles (e.g. for University Centres):	3.7	7.0	2.7
Secondments	0.1	0.5	0.0
Estimated number of telephone / email exchanges	615	1597	316

Source: PACEC Survey of TSB staff 2011

2.3.11 Evidence from the qualitative interviews suggested that some TSB staff were often invited to present at highly selective events which brought together senior academics in key fields; and that this provides a useful avenue to engage with key researchers.

2.3.12 Some of the senior TSB staff interviewed also noted that they often held meetings/workshops with groups of universities, sometimes on a regional basis with university clusters, for example, to explore collaboration on programmes; or to discuss how programmes may work better to suit mutual requirements, e.g. group “sandpits” or discussions.

Methods for initiating non-transactional interactions

2.3.13 Non-transactional interactions between TSB and university staff were initiated in a variety of ways. Direct contact initiated by university staff (either personally or by colleagues) and mutual contact (e.g. an informal meeting at an event) were considered the most important methods for initiating the interaction. Almost all the staff interviewed thought that these methods were at least “somewhat important”, and 45% thought that direct contact initiated by TSB staff and mutual contact were “very important”. Referral from businesses was rated as “very important” by 46% of TSB staff, but as “unimportant” for many (33%). See Table 2.4.

2.3.14 Heads of department were significantly more likely to view direct contact initiated by university staff as very important; 70% of senior staff believed this to be the case, compared to 24% of non-heads. The senior TSB staff interviewed also mentioned how they often initiated the meetings with universities, where policy needed to be communicated, and an overview was required on the fit between TSB aims, programmes and university requirements.

2.3.15 Interestingly, the in-depth interviews with selected TSB staff suggested that referrals through the Research Councils were a very important method for identifying relevant university contacts. This did not come out as significant in the survey. Respondents pointed out that they sometimes approached the Research Councils to ask them to invite the top academics in particular areas of research to a workshop. They then brought in the relevant businesses and provided a forum for stimulating the necessary interactions between academia and industry. This was usually done to help identify key issues and challenges facing industry and help inform academics of key areas of necessary research.

Table 2.4 Importance of methods for initiating non-transactional interactions with university staff

	Percentages of all respondents			Number of respondents
	Not at all important	Somewhat important	Very important	
Direct contact initiated by you:-	4	51	45	29
Direct contact initiated by university staff	0	66	34	31
Referral from TSB colleague	11	43	47	28
Referral from business	33	21	46	27
Mutual contact (e.g. informal meeting at event)	2	53	45	30
Through Research Councils	28	36	35	27

Source: PACEC Survey of TSB staff 2011

- 2.3.16 Other methods identified by TSB staff as mechanisms for initiating such interactions included: working with groups such as the Council for Industry and Higher Education (CIHE) and the Big Innovation Centre; and through regional and sub-national innovation agencies such as Scottish Enterprise and the Welsh Assembly Government. Some staff explicitly mentioned the importance of events such as Innovate, and the events that are part of the TIC programme. The website and Connect platform were also mentioned by a small number of staff.

2.4 Purpose of non-transactional interactions

- 2.4.1 Given the level of engagement of TSB staff with university staff through these non-transactional interactions raises the important question of what purpose staff believe these types of interactions serve; what motivates them to engage. The motivations tell us a lot about the intended benefits that TSB staff expect to realise from these types of interactions and how they support their professional objectives.
- 2.4.2 It is clear from the findings of the survey that the role that TSB plays in brokering relationships and collaboration between universities and businesses to potentially benefit the economy is an important motivator for most staff when engaging in the non-transactional activities (Table 2.5). 85% of TSB staff said that helping to improve collaborations / links between businesses and universities was either “very important”; or “critical” as a motivation, with 31% believing it to be critical. This role is very important, given other evidence on university-industry knowledge exchange which suggests that difficulties in identifying partners is a significant constraint to knowledge exchange between these parts of the innovation system.

Table 2.5 TSB staff motivations for non-transactional interactions with universities

	Percentages of all respondents					Number of respondents
	Not at all important	Somewhat important	Very important	Critical	Very important or critical	
Improve collaboration / help link businesses with researchers	7	8	54	31	85	28
To help academics understand business needs in innovation / technology / commercialisation	8	10	52	30	82	31
To raise awareness of TSB and its programmes	6	14	66	14	80	31
To build networks of individuals with expertise in my area	8	24	44	24	68	30
To help shape TSB strategies/programmes	19	15	31	36	67	29
To gain understanding of the latest research / technologies in a particular area	11	29	40	20	60	31
To help increase the quality of academic-business proposals to TSB	14	27	44	14	58	29
To help make better decisions regarding TSB transactional activity	19	28	39	15	54	31
To ensure programmes are operating efficiently and effectively	14	44	31	10	41	29
To develop my own personal expertise in a particular area	22	47	32	0	32	30
To guide academics towards areas of funding by TSB	17	57	26	0	26	28
To gain understanding of university needs for funding support	42	40	18	0	18	29

Source: PACEC Survey of TSB staff 2011

2.4.3 Almost as important a motivation is to help academics understand business needs in innovation, technology, or commercialisation (79% “very important” or “critical”, 31% “critical”). This suggests that TSB staff perceive part of their role in this area is to help improve the ability of universities to engage with industry by making their needs better understood.

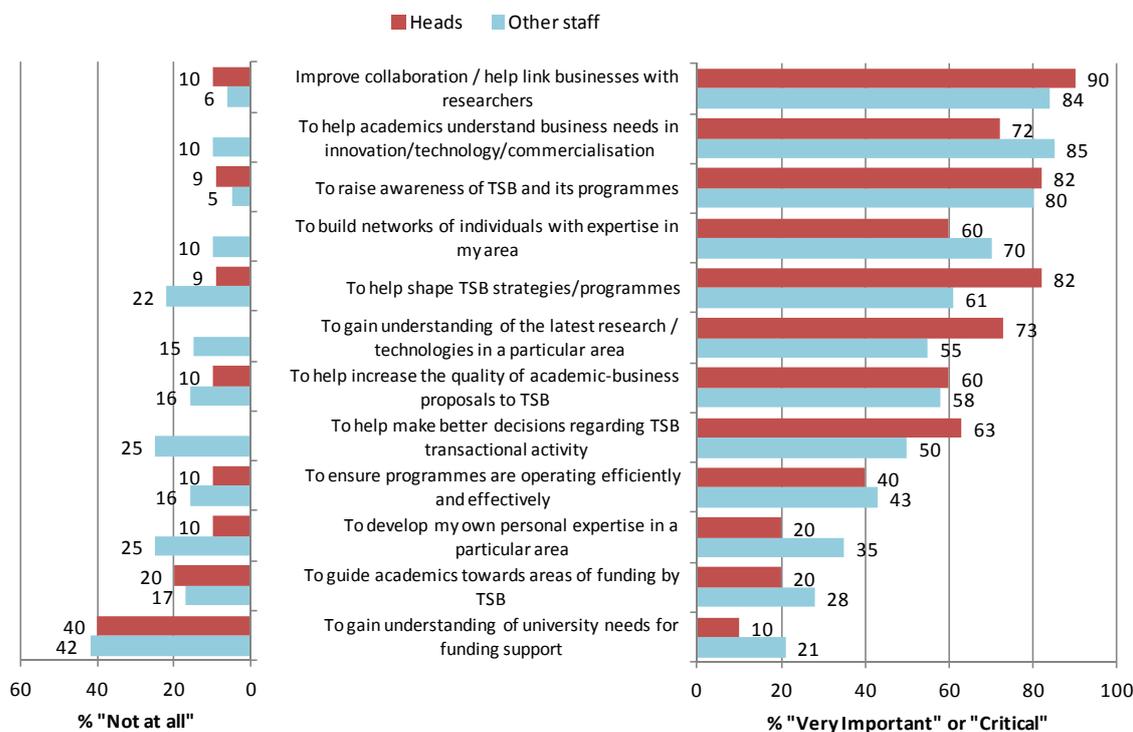
2.4.4 A similar share also noted that they interact to help raise awareness of TSB programmes amongst universities (79%; 17% critical). Two-thirds claimed that it was very important or critical to carry out these interactions to help shape TSB policies and its programmes, and 36% said that this was critical; only a minority, i.e. 19%, did not believe that this was important at all. Some of the interviewees considered that the universities were very good at identifying sources of finance and that in the main the universities were looking for funding when they engaged with TSB staff. In this context TSB staff could steer them towards helping achieve the TSB aims through the programmes.

2.4.5 The least important motivations of staff were: to develop their own expertise; to gain understanding of university needs with regards to funding; and to actively guide academics towards areas of funding of the TSB.

2.4.6 Given these views, some of the consultations highlighted that some staff did not attach a great deal of importance to the non-transactional activities compared to the transactional ones. The latter provided a direct and “more concrete” opportunity to help ensure that business benefits would flow and the outputs could be monitored over the period of projects and programmes. While general networking may have some communication and inter-relational benefits, in a wider context they may not be as effective at delivering benefits.

2.4.7 Figure 2.5 shows the views of TSB departmental heads and other staff. The main significant difference between heads and other staff was over the importance of non-transactional activity in improving decision-making that affected TSB transactional activity, which possibly reflects the different levels of responsibility for this amongst TSB staff: 45% of heads said that this outcome was critical, but only 5% of other staff agreed and a quarter said they did not think it was important.

Figure 2.5 Motivations for non-transactional interactions, by position within TSB



2.4.8 The in-depth interviews with senior TSB staff also emphasised that the main aims of the non-transactional interactions were to familiarise the universities with TSB aims, raise awareness, and help to facilitate their engagement around the “business agenda” and the benefits for businesses. To move this forward they sought to improve business- university collaboration generally and in the programmes. The more senior staff interviewed also suggested that there may be less of a separation between the non-transactional and transactional interactions as the more informal meetings and discussions are often related to the strategic aims of TSB, shaping the programmes and “toolkits”, and communicating TSB’s aims.

2.4.9 In addition, for senior TSB staff, the aims were often to communicate the strategic role of TSB in assisting businesses to be more competitive and commercialise the outputs of research and development. This was critically important given the government's growth agenda. The universities were seen as collaborators and facilitators in this process, especially in terms of helping to generate ideas, and providing solutions and advice on technology issues faced by businesses.

2.5 Benefits to the TSB from non-transactional interactions

2.5.1 The key aim of this section is to assess the benefits arising from the non-transactional interactions on three of the key stakeholders in the process: the TSB itself as it seeks to run its operations to support and stimulate innovation in businesses; the universities as they seek to produce and exchange knowledge, and form their own linkages with businesses in the innovation process; and the benefits for the businesses themselves. It also estimates the time opportunity cost of engagement. The section provides:

- A detailed understanding of the diverse set of benefits of the non-transactional interactions to the TSB and how these help the TSB to achieve its goals of stimulating innovation in business
- A view of TSB staff of the benefits to universities and to businesses
- The perceived gross additionality of the benefits (extent to which the benefits would have happened in the absence of the non-transactional interactions)
- The time cost of interacting with universities

2.5.2 The following key benefits to the TSB from TSB-university non-transactional interactions were viewed as "medium impact" or "high impact" by 60% or more of staff:

- Creating a more coordinated or strategic approach at TSB (75%; 27% high impact)
- Greater understanding of key trends and impacts of research (72%; 37% high impact)
- Understanding of the research/commercialisation needs of universities (66%; 23% high impact)
- Helping to refine the scope of TSB programmes (60%; 24% high impact)

2.5.3 The most significant statistical difference between heads and other staff was over their views on the impact on creating a more coordinated or strategic approach at TSB with 55% of departmental heads feeling their non-transactional interactions had a high impact on this compared to just 19% of other staff. Senior staff interviewed noted that they helped them in scoping for competitions as well as mapping out the university basic research trends and technology issues with a view to exploring the development implications and potential links with businesses and programmes. For senior staff the interactions also provided the opportunity to convey the TSB "message" and aims together with programme developments, providing a more coordinated and holistic message to universities.

2.5.4 Over half of TSB staff (56%) believed that their non-transactional interactions with universities had a medium or high impact on helping them to build networks that reduced the search costs of finding the knowledge that they needed to achieve their professional objectives. However, these networks were not used to help find skills to support TSB in achieving its objectives (e.g. for recruitment or secondments).

Table 2.6 Main benefits to the TSB arising from non-transactional interactions with universities

	Percentages of all respondents					Number of respondents
	No impact	Low impact	Medium impact	High impact	Medium or high impact	
Creating a more coordinated / strategic approach at TSB	2	23	48	27	75	32
Understanding key trends and impacts of research	0	28	35	37	72	31
Understanding of the research / commercialisation needs of universities	2	31	43	23	66	31
Helping to refine scope of TSB programmes	16	24	36	24	60	30
Building networks which reduce search costs	10	34	42	14	56	30
Understanding of innovation needs in business	13	42	39	6	45	31
Quality/speed of decision making re. programmes	32	27	31	10	41	31
Building in-house expertise in key research areas within TSB	34	25	29	12	41	30
Reducing search costs for finding necessary skills (e.g. for recruitment)	46	47	8	0	8	30

Source: PACEC Survey of TSB staff 2011

2.5.5 Other benefits to the TSB that were mentioned by staff include strategic policy development for TSB and in helping to ensure a more coordinated approach between BIS, the Research Councils and TSB. They also mentioned the importance of bringing universities and businesses together in new, emerging technology areas as well as helping to build trust between the key players in the innovation system.

2.5.6 Only a minority of staff believed that the interactions impacted significantly on the quality or speed of decision making, on building in-house expertise in key areas, or understanding innovation needs in business.

2.5.7 Some of the benefits were questioned by TSB staff in that the non-transactional activities were in part “experimental” and reflected the early stages of the TSB development. The programmes had become more established, and along with their aims provided a clear opportunity to achieve the TSB aims. They had also allowed considerable “programme specific” informal networks to be built up and maintained.

2.6 Benefits to the universities from non-transactional interactions

- 2.6.1 According to the perceptions of TSB staff, the benefit with the highest-impact for universities was to help them understand the TSB funding available. See Table 2.7. 67% staff said this had had a high impact, and almost all the remainder said that it had a medium impact (on a scale which also included the options “low impact” and “no impact”. The senior TSB staff interviewed echoed these findings suggesting that they helped universities keep abreast of developments at TSB, potential new initiatives and themes, and funding streams. The funding streams were critical to the universities, especially in the current economic context where finance generally was constrained. Hence, obtaining funds from TSB was often a priority for the universities. However, the non-transactional activities could also help university staff to keep abreast of interesting/emerging research fields from the TSB perspective
- 2.6.2 Other important impacts included:
- Helping to improve the culture amongst universities towards engaging with business (89% high- or medium- impact)
 - Helping universities gain understanding of nationally important areas of research (85% high-or medium-impact)
 - Helping universities gain a better understanding of the needs of business (80% high- or medium- impact)
- 2.6.3 The second most frequently cited “high impact” benefit was in helping universities find approach business partners (31% of staff). A further 34% believed this to be of medium impact. This is consistent with the notion that TSB staff can play a ‘brokerage’ role in facilitating the building of links between partners in the innovation value chain.
- 2.6.4 The main statistically significant difference between the departmental heads and other staff was over their views on the impact of non-transactional interactions on improving the culture within universities to engage in knowledge exchange within the overall responses shown in Table 2.7. 55% of departmental heads said there had been a “high-impact” compared to just 14% of non-heads.
- 2.6.5 The data in the table shows that, by contrast, 67% of other staff (non-heads) believed that their interactions with universities had a medium impact on helping to improve the universities understanding of the needs of business. This was in comparison to just 18% of departmental heads.
- 2.6.6 Despite improving the ability of universities to apply for funding not being a prime motivator for forming non-transactional interactions, 75% of TSB staff believe that it has at least a medium impact on universities.

Table 2.7 Main benefits to the universities from non-transactional interactions between the TSB and universities

	Percentages of all respondents					Number of respondents
	No impact	Low impact	Medium impact	High impact	Medium or high impact	
Understanding of the TSB funding available	0	4	30	67	97	32
Helping to improve culture amongst universities towards engaging with business	4	8	65	24	89	32
Improved knowledge of university of key research areas of national importance	0	15	59	26	85	32
Helping universities improve their understanding of the needs of business	4	16	55	25	80	32
Ability of universities to apply for / access funding	0	25	42	33	75	32
Helping universities find appropriate partners in business	4	25	37	34	71	32
Providing universities with a better understanding of uncertainties	10	42	37	10	47	30

Source: PACEC Survey of TSB staff 2011

2.6.7 Other key perceived benefits for universities arising from TSB-university non-transactional interactions include helping university staff to develop sustainable, ongoing business relationships; and helping universities to engage with KTNs.

2.7 Benefits to business from non-transactional interactions

2.7.1 As well as benefits to the TSB and to universities themselves arising from their non-transactional interactions, the survey participants were also asked to rate their perceptions of the scale of impact on key areas of potential benefits for businesses.

2.7.2 The most frequently cited medium- or high-impact benefit was helping businesses to find appropriate university research collaborative partners. This was rated as “medium impact” by 58% of TSB staff and “high impact” by 33%. This supports the notion that the TSB can help fulfil a brokerage role in the innovation process, by reducing the search costs of finding appropriate partners, which likely to be key for some companies who lack the resources or ability to always do this. It was suggested by some senior staff that the non-transactional activities allowed them to engage with universities that did not secure a lion’s share of the main stream programme or portfolio funding. These universities could meet the needs of businesses (especially the SMEs) in niche and specialist areas where the universities had specific expertise (e.g. marine exploration, renewable energy fields and the creative industries sectors).

2.7.3 Another significant benefit is the alignment of research to the needs of business. 33% of staff said that this was a “high impact” benefit to business, and 40% said that it was a “medium impact” benefit. 77% believed that their interactions were having a

medium or high impact on helping to make university research more relevant for commercialisation, although this was typically (i.e. in 60% of cases) viewed as a medium-impact benefit. Both the above are alignment issues that help to ensure that what universities are doing is relevant to innovation needs of business and maximise the potential impact of the research. Combined with the benefits these interactions have on changing culture within universities, the above help to make universities more responsive to the needs of businesses.

- 2.7.4 84% thought that a medium/high impact benefit was helping businesses access new ideas / different perspectives. 69% believed that their interactions had at least a medium impact on helping to improve the culture amongst businesses towards engaging with universities.
- 2.7.5 “Improving business performance” was seen as the least significant benefit to businesses of non-transactional interactions with universities. Here there was a significant difference of opinion between departmental heads and other staff: 36% of heads thought that there was a high impact upon business performance, but only 5% of other staff agreed.
- 2.7.6 One member of TSB staff made an important observation, noting that start ups and entrepreneurs may gain very different benefits from their interactions with universities and TSB compared with large corporations, and that universities may be a good catalyst for connecting these businesses.

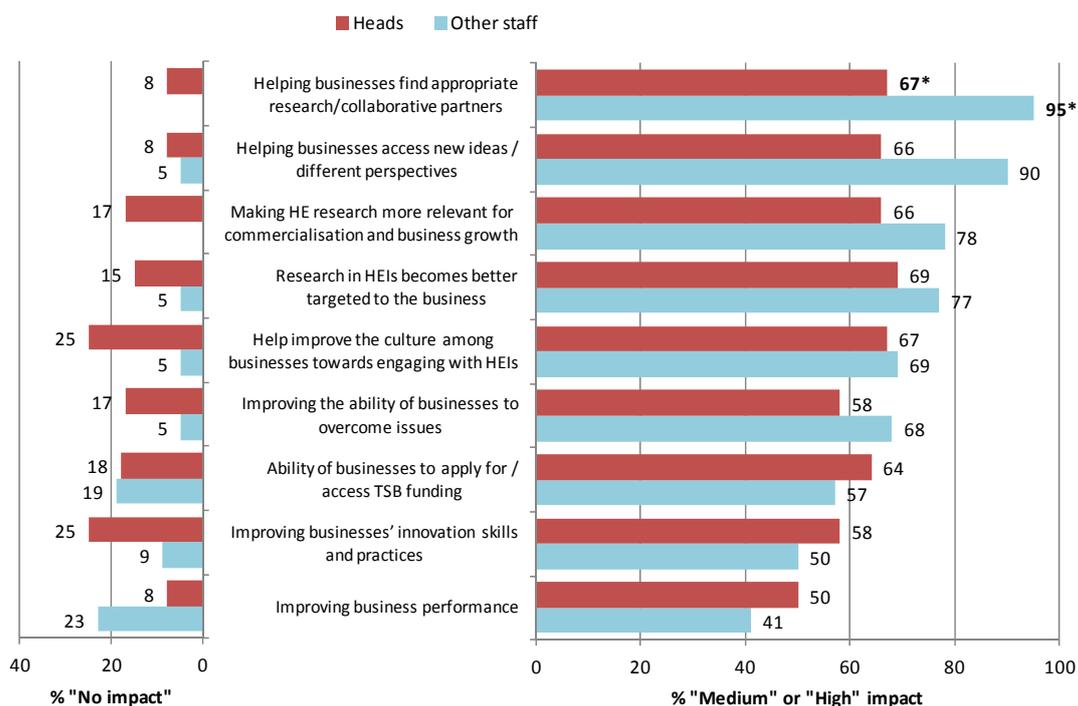
Table 2.8 Main benefits to the businesses from non-transactional interactions between the TSB and universities

	Percentages of all respondents					Number of respondents
	No impact	Low impact	Medium impact	High impact	Medium or high impact	
Helping businesses find appropriate research/collaborative partners	2	6	58	33	91	32
Helping businesses access new ideas / different perspectives	6	10	51	33	84	31
Making university research more relevant for commercialisation and business growth	4	19	60	17	77	32
Research in universities becomes better targeted to the business	8	19	40	33	73	32
Help improve the culture among businesses towards engaging with universities	10	20	54	15	69	32
Improving the ability of businesses to overcome issues	8	25	40	28	68	32
Ability of businesses to apply for / access TSB funding	20	20	38	22	60	30
Improving businesses' innovation skills and practices	14	33	43	10	53	32
Improving business performance	17	40	31	12	43	32

Source: PACEC Survey of TSB staff 2011

2.7.7 It is perhaps surprising that while TSB staff thought that there were benefits to businesses in terms of collaboration, access to ideas, university and that research was better targeted for businesses, very few staff thought there were high impacts in terms of improving the innovation skills and practices of businesses or their performance (e.g. turnover, jobs and profits).

Figure 2.6 Main benefits to the businesses from non-transactional interactions, by position of TSB staff



Note: Asterisks denote statistically significant differences between departmental heads and other staff.
 Source: PACEC Survey of TSB staff 2011

2.8 Additionality of the benefits realised

- 2.8.1 It is very important to try and get an idea of the extent to which the benefits described above would have been realised in the absence of the non-transactional interactions between TSB staff and universities – i.e. the ‘additionality’ of the benefits. If the benefits would have been realised through other means, questions would have been raised as to whether the interactions with the TSB were the best possible method for securing the benefits.
- 2.8.2 The evidence from the survey suggests that around 60% of the TSB staff believe that the benefits outlined above probably or definitely would not have been realised by the TSB and the universities in the absence of these interactions, suggesting a relatively high level of additionality.
- 2.8.3 However, approximately 20% believe that the benefits to the TSB and universities probably would have been realised in the absence of these interactions (though none said that they would definitely have been realised).
- 2.8.4 Just over half believe that the benefits to business probably or definitely would not have been realised, while 33% believe they possibly would have been realised and 21% believe they probably or definitely would have been realised.

- 2.8.5 This slight discrepancy between the additionality of benefits to TSB and universities, and to businesses, is unsurprising given that the impacts on the businesses through these interactions are one step removed and likely subject to many other factors.

Table 2.9 **Extent to which the benefits would have been realised in the absence of non-transactional interactions with universities**

	Percentages of all respondents, by type of beneficiary		
	TSB	Universities	Businesses
Definitely realised in the absence of these interactions	0	0	6
Probably realised in the absence of these interactions	21	19	6
Possibly realised in the absence of these interactions	17	21	37
Probably not realised in the absence of these interactions	50	52	47
Definitely not realised in the absence of these interactions	12	8	4
Number of respondents	31	31	31

Source: PACEC Survey of TSB staff 2011

- 2.8.6 The main statistically significant difference between levels of TSB staff over the perceived additionality of benefits surrounded the benefits realised by universities. Departmental heads are much more likely than other staff to believe that the benefits to the universities would not have happened in the absence of these types of interactions, with 89% believing that they probably would not, or definitely would not have happened, compared 53% of other staff.

2.9 The time-opportunity cost of engagement

- 2.9.1 An important cost element of the interactions is the time spent on the interactions. On average, TSB staff spend approximately 7% of their time on non-transactional interactions with universities. However, the survey showed that departmental heads spend approximately twice as long as other staff, spending 10.5% of their time, compared to 5.6% for other staff (Table 2.10).
- 2.9.2 Making assumptions on the number of hours worked per week and the number of working weeks per year (see Table 2.10) suggests that approximately 9,150 hours are spent per year interacting with universities.

Table 2.10 Time spent on non-transactional interactions with universities, by position of TSB staff

	Seniority of staff		
	All staff	Heads	Non-Heads
Share of time spent on non-transactional interactions with universities	7.0	10.5	5.6
Hours worked per week	42.4	50.0	40.0
Number of staff	67.0	16.0	51.0
Approximate number of hours spent on non-transactional interactions with universities per week	198.9	84.0	114.9
Number of weeks worked per year	46.0	46.0	46.0
Approximate number of hours spent on non-transactional interactions with universities per year*	9,150	3,860	5,280

Note: number may not sum due to rounding
Source: PACEC Survey of TSB staff 2011

2.10 Constraints and improvements to effectiveness

- 2.10.1 It is clear from the previous sections that TSB staff believe that non-transactional interactions with universities deliver benefits to both the universities and to businesses to help support innovation. These are achieved through helping to link partners, reducing the search costs involved, helping to make research more relevant for commercialisation and innovation in businesses and ensuring research in HEIs is better targeted to the needs of business. In addition, TSB staff believe an important benefit from their non-transactional interactions with university staff is the change in culture at universities to ensure they are more willing to engage with businesses.
- 2.10.2 These important benefits perceived by TSB staff were thought to be largely additional in that they are not likely to have occurred in the absence of the non-transactional interactions.
- 2.10.3 Given these benefits, this final section explores the types of mechanisms that different staff believe to be most effective at delivering benefits; the factors that might be limiting TSB staff in their interactions with universities; and what might be done to improve the support for such activity.

2.11 The effectiveness of mechanisms in delivering benefits

- 2.11.1 TSB staff were asked to assess, in general terms, the types of mechanisms used for their non-transactional interactions with universities and whether they were effective in generating the benefits discussed earlier. It was not possible to determine from the survey, however, the effectiveness of individual mechanisms in generating specific types of benefits.
- 2.11.2 Meetings with both business and university staff present were seen by the largest proportion of TSB staff (56%) as being very effective for delivering the benefits (58%

for heads; 56% for other staff), while meetings with just university staff were seen by the majority (64%) as being only generally effective (and 22% see them as not so effective). However, this masks an important, statistically significant, difference between departmental heads and other staff: 42% of department heads believe meetings with university staff only are very effective compared to 5% of other staff. The potential reason for this is that the senior TSB staff can make it clear what the TSB priorities are on a “one to one” basis prior to joint meetings with businesses. The departmental heads engage more frequently with through meetings just with universities, and through meetings with both universities and businesses present compared to other TSB staff.

- 2.11.3 90% of TSB staff believed that conferences/events/workshops were at least generally effective in helping to achieve aims, with 28% believing them to be very effective. It is not clear whether these were TSB events or events organised by the universities and other intermediaries. This is the most frequent method of engagement other than telephone/email exchanges. Such events are also more likely to bring a larger number of individuals into contact helping with one another and potentially to reduce the costs of finding the appropriate collaborators and research partners. Informal interactions (telephone/email) provide a different role but are seen by 61% of staff as only generally effective, although almost a third believe them to be less effective. This suggests that direct contact and geographic proximity is important for interactions to be effective. Involvement with advisory boards (at university centres) was considered, by most, to be generally effective. A quarter thought they were very effective but the same proportion of TSB thought they were not.

Table 2.11 Effectiveness of mechanisms in delivering the benefits

	Percentages of all respondents			
	Very effective	Generally effective	Less effective	Number of respondents
Meetings with university staff (no business present)	15	64	22	30
Meetings with both business and university staff present	56	41	2	29
Conferences/events/workshops	28	62	10	32
Advisory board roles (e.g. for University Centres)	22	53	25	20
Secondments	19	57	24	13
Telephone/email exchanges	8	61	32	30
Your other mechanism	8	79	13	9

Source: PACEC Survey of TSB staff 2011

2.12 Constraints to non-transactional interactions with universities

- 2.12.1 The factors constraining the benefits being realised from the interactions can provide very useful indications of where activity needs to be focused to improve the outputs. The survey showed that relatively high proportions of TSB staff identified a range of constraints, i.e. over half the staff identified seven of the thirteen factors they were

specifically asked about (and five of these were selected by two thirds of staff or more). Some of the constraints were strategic and to do with overall direction and aims at TSB, others were more operational and concerned with the time available for the interactions. See Table 2.12.

Table 2.12 Factors limiting the ability of TSB staff to realise benefits from non-transactional interactions

	Percentages of all respondents				Number of respondents
	Not a constraint	Somewhat constraining	Very constraining	Somewhat or very constraining	
Lack of time for TSB staff to fully engage with universities	12	31	57	88	32
Lack of co-ordination of interactions with other TSB staff	29	56	16	72	30
Lack of time for university staff to fully engage	30	62	8	70	30
Lack of understanding of the needs of business amongst university staff	31	45	24	69	30
Difficulty in identifying appropriate university staff	32	64	4	68	30
Transactional interactions are more important	47	43	10	53	30
Uncertainty about the aims of university non-transactional interactions	50	38	12	50	30
Business and academics are not willing to collaborate	55	41	4	45	29
Do not believe there are sufficient benefits from these interactions	61	37	2	39	29
Lack of support for engaging with universities	64	22	14	36	30
Direct costs of the interactions are too high	66	30	4	34	30
Difficulties in making contact with appropriate university staff	66	29	4	33	29
University staff not willing to engage with TSB	72	22	6	28	30

Source: PACEC Survey of TSB staff 2011

2.12.2 The survey of staff shows that the main constraint to non-transactional interactions (and benefits from being realised) was a lack of time for TSB staff. This meant they found it difficult to fully engage with universities. 57% said that this was “very constraining”, 31% said it was “somewhat constraining”, and only 12% said that it was not a constraint. The interviews with senior TSB staff also highlighted that non-transactional activity was quite time-consuming and difficult to maintain if they were to be effective. Similarly, 70% of all TSB staff believed that university staff had a lack of time to fully engage with TSB and this was at least somewhat constraining (although just 8% believed this to be very constraining). This is consistent with other research looking at academic knowledge exchange activities where a lack of time is often the most frequently cited constraint². Importantly, however, most TSB staff did not believe that university staff were unwilling to engage.

² HEFCE. *Analysis of HEIF 4 Institutional Strategies*. 2008. PACEC

- 2.12.3 Interestingly, the second most frequently cited constraint (seen as somewhat or very constraining) was a lack of coordination for their interactions amongst TSB staff. This was seen as a constraint by 72% of staff (16% say it is very constraining) which is an issue for TSB given that referral from TSB colleagues is seen as an important method for initiating university interactions. When this is analysed by staff level at TSB, we find that departmental heads are statistically significantly much less likely to view this as a constraint compared to other staff (60% of senior staff said this was not a constraint compared to just 20% of other staff). This is possibly because the senior staff make direct contact with their university counterparts and are not dependent on referrals.
- 2.12.4 Two-thirds of TSB staff also believed that the difficulty in identifying appropriate university staff was somewhat of a constraint, suggesting that the TSB, like many other organisations, incurs potentially significant search costs in finding partners. This result may seem surprising given the range of networks TSB has related to its programmes and the extent of the ongoing non-transactional activities. However, once the partners have been identified, there do not appear to be significant difficulties in making contact with the university staff.
- 2.12.5 A lack of understanding of the needs of business amongst university staff is the second “very constraining” factor, with 24% believing this to be the case. This underpins the motivation stated by TSB staff that raising awareness in universities to the needs of business was a key aim. However, the finding above indicates that more still needs to be done. Departmental heads were statistically much more likely to view this issue as constraining, with all of them believing this to be the case compared to just 60% of other staff.
- 2.12.6 53% of all staff believed that their transactional interactions were more important and that this was “somewhat” or “very” constraining in terms of their ability to realise benefits from non-transactional interactions. Given the time constraints of many, there may be pressures to prioritise transactional over non-transactional interactions, where the observed value may be more tangible.
- 2.12.7 Just 36% believed that a lack of support from TSB for engaging with universities is a constraint to undertaking these non-transactional interactions. However, 50% were not sure of **why** they needed to have non-transactional interactions with universities and they were uncertain about the aims.

2.13 Improvements in support for non-transactional interactions

- 2.13.1 The analysis of constraints above suggests a number of factors need to be considered by TSB. The time available, coordination issues and awareness of the needs of business by academics are key operational areas that need to be addressed to help ensure the benefits are realised. However, related to these, and at a more strategic level is the need to improve the understanding amongst staff as to why the non-transactional interactions are important and what they should get out of them,

both in terms of the benefits to business as well as for supporting their transactional activities (i.e. the TSB projects and programmes). Within this context, the key areas suggested directly by TSB staff for improvement are shown below. To convey their meaning the terms used by TSB staff are retained.

Time available and justification for interactions

- Greater clarification as to the aims of interactions and targets to achieve
- Steps to make more time available, perhaps by the inclusion of personal milestones into workload planning
- Improving the understanding amongst universities of the importance of supporting innovation in business
- Clarifying how non-transactional interactions can support transactional ones
- Improving the understanding of the range of interactions with universities and how they support innovation in businesses
- Improving understanding of how TICs fit into the innovation space, along with other programmes, and create links between universities and business

Coordination of interactions

- The development of a strategic approach to interacting with universities with clear aims and objectives (note that this would also help demonstrate to all staff why non-transactional activity was a valuable use of time in addition to transactional activity)
- Improving the CRM system to better capture and map networks with university staff and making it more easily accessible and usable. Greater distinction could be made between the different types of university staff to engage with and what role they may play
- Working with the Research Councils to ensure incentives are aligned to help drive universities towards business-relevant activities

Mechanisms for interaction

- Developing the TSB platform and website to provide better signposts for businesses and universities into the TSB, and providing links into the wider specialist business support networks and expenditure including venture capital sources
- Making better use of KTNs and their informal networks and encouraging greater engagement with universities and businesses to capture expertise and build links
- Providing more opportunities for structured meetings with universities and businesses
- Enhancing events such as Innovate to bring TSB/business/academia together
- Facilitating cross-platform technology events to encourage networking and the development of informal introductions / relationships (it was considered that the current structures do not facilitate this)

2.14 Summary of the Interviews

2.14.1 The summary points from the discussions above are as follows:

Interactions with universities

- TSB / university interactions are an important part of the TSB's activity. A portfolio analysis undertaken by the TSB of TSB funding shows that 66% of the total current portfolio of research and training commitments involves university collaboration. This amounts to approximately £550 million. 37% of the funding goes directly to support universities and 15% of Knowledge Transfer Network (KTN) members are from academia.
- The portfolio analysis also found that 69% of the total portfolio involving universities (including CR&D, KTPs and Research Council contributions) was received by just 25 universities. The universities of Cambridge and Leeds received the highest amounts.

The non-transactional TSB interactions with universities

- TSB staff are involved in a wide range of non-transactional interactions with the university sector – ie not directly related to the portfolio funding for universities.
- Underpinning this activity, typically, TSB staff have widest non-transactional networks with researchers and academics at universities. 55% of staff have had non-transactional interactions with 5-19 researchers or academics over the past year. Technology transfer / commercialisation staff at universities are also important for TSB staff interactions; 56% have had non-transactional interactions with 1-9 technology transfer or commercialisation staff.
- There is a marked difference in levels on interaction with senior university management with TSB heads of department having much more interaction than other TSB staff.
- Overall, other than telephone and email exchanges, attendance at conferences, events and workshops were the most frequent types of interactions, with TSB staff attending on average of some 13 such activities each in the past year. These were followed by meetings with university staff, ie with no others present such as businesses.
- TSB departmental heads engage more frequently than non-heads in non-transactional interactions, especially through meetings with universities. The most common forms of interaction for non-heads were conferences, events, and workshops.
- Direct contact initiated by university staff and mutual contact by TSB and universities (for example, an informal meeting at an event) were said to be the most important methods of initiating the interactions.
- Heads of department were more likely to say that direct contact initiated by university staff was very important.

The purpose of non-transactional interactions

- The role that TSB plays in brokering relationships between the knowledge users and producers as part of the innovation system is a very important motivator for most TSB staff when engaging in university interactions, ie 85% of TSB staff said that helping to improve collaboration / links between businesses and universities was either "very important"; or "critical" as a motivator, with 31% saying it was critical.
- Almost as important a motivation was the aim to help academics understand business needs in innovation, technology, or commercialisation (79% saying "very important" or "critical", and 31% saying "critical").
- A similar share of TSB staff also said that they interact with universities to help raise awareness of TSB programmes (79%; 17% critical). Two-thirds

claimed that it was very important or critical to form these interactions to help shape TSB policies and programmes.

The benefits from non-transactional interactions with universities

- The following key benefits to the TSB from the university non-transactional interactions were identified by staff:
 - Creating a more coordinated or strategic approach at TSB (75% of staff with 27% claiming a high impact)
 - Greater understanding of key research trends and the impacts of research (72% of staff with 37% stating a high impact)
 - Greater understanding of the research/commercialisation needs of universities (66% of staff with 23% stating a high impact)
- In terms of the benefits to universities the greatest impact on universities (in the view of TSB staff) was helping them understand the TSB funding available. 67% of staff said the interactions had a high impact, and almost all the remainder said that they had a medium impact. Other important impacts included:
 - Helping to improve the culture at universities towards engaging with business (89% high or medium impact)
 - Helping universities gain an understanding of nationally important areas of research (85% high or medium impact)
 - Assisting universities to gain a better understanding of the needs of business (80% high or medium impact)
- The main benefits for businesses of the TSB / university interactions were perceived to be:
 - Helping businesses identify an appropriate university research collaborative partner. This was the most frequently mentioned impact (with medium or high impacts). It was rated as “medium impact” by 58% of TSB staff and “high impact” by 33%.
 - A further important benefit was the alignment of university research to the needs of business. 33% of TSB staff said that there was a “high impact” benefit to business, and 40% said that it was a “medium impact” benefit.
 - 77% of TSB staff believed that their interactions were having a medium or high impact on helping to make university research more relevant for business commercialisation.
- The evidence from the survey suggests that around 60% of the TSB staff believe that the benefits outlined above for TSB and the universities would probably or definitely not have been realised by the TSB and the universities in the absence of the non-transactional interactions, suggesting a relatively high level of additionality.
- Just over half believed that the benefits to business probably or definitely would not have been realised without the non-transactional interactions.
- An important cost element of the interactions is the time spent on the interactions. On average, TSB staff spend approximately 7% of their time on non-transactional interactions with universities. However, the survey showed that departmental heads spend approximately twice as long as other staff, spending 10.5% of their time, compared to 5.6% for other staff.
- Making assumptions on the number of hours worked per week and the number of working weeks per year, the analysis suggests that approximately 9,150 hours are spent per year on non-transactional activities with universities.

Constraints and improvements to effectiveness

2.14.2 These points and suggestions were put forward by the TSB staff:

- The main constraint to non-transactional interactions was a lack of time for TSB staff to fully engage with universities.
- A lack of understanding of the needs of business amongst university staff is the second most frequently mentioned constraint.
- A lack of coordination of interactions amongst TSB staff is also seen as a constraint.
- Uncertainty over the aims of non-transactional activities which could be clarified to improve effectiveness.
- 53% of TSB staff believed that their transactional interactions were more important than the non-transactional interactions and that this was seen as “somewhat” or “very” constraining.
- Meetings with both business and university staff present were seen by the largest proportion of TSB staff (56%) as being very effective for delivering the overall benefits and aims.
- Meetings with just university staff were seen by the majority of TSB staff (64%) as being only generally effective. However, this masks an important difference in views between TSB departmental heads and other staff: 42% of department heads believe meetings with university staff only are very effective compared to 5% of other staff.
- 90% of TSB staff believed that conferences/events/workshops were at least generally effective.

3 The Survey of University Staff

3.1.1 This section presents the findings from the second phase of the two-phase project designed to assess the benefits of non-transactional interactions between TSB and universities. It reports on the perceptions of senior university about the purpose and value of their interactions with the TSB staff they have engaged with, and their views on the businesses they have collaborated with in the process. In particular, the survey of university staff sought to understand their motivations for engaging with TSB staff in the first place, and the benefits which they considered to flow from these interactions. The inquiry was extended to understand the factors that constrain such interactions, and how they could be overcome. A better understanding of those factors could help improve the links between TSB and higher educational institutions (HEIs), and contribute towards stimulating innovation amongst businesses.

3.1.2 More than 40 university staff were interviewed for this stage of the research. They included both academic and non-academic staff involved in knowledge transfer projects. As can be seen from Table 3.13, three out of four respondents (74%) were academics, while further disaggregation of the data showed that just over two-fifths (44%) of the respondents were in a senior position at their university. The respondents came equally from among the top 25 universities (49%) and from institutions outside the top 25.

Table 3.13 Position of respondents

	Percentages of all respondents		
	Total	Senior	Non-Senior
Academic	42	0	75
Senior Academic	33	74	0
Knowledge Transfer	14	0	25
Senior Knowledge Transfer	12	26	0
Number of respondents (rate= %)	43	19	24

Source: PACEC Survey of University Staff, 2012 (Q0)

3.2 Nature and scale of non-transactional interactions with TSB

3.2.1 The survey sought to establish, first, the scale of the respondents' interactions with TSB staff. They were asked how many interactions they had had over the past year. The survey showed that on the whole the respondents quite frequent contact with TSB staff. Indeed, only a handful (2%) claimed not to have had any interactions at all with TSB staff during the past year. At the other end of the spectrum, one in six respondents (16%) had engaged with TSB staff on 50 or more occasions during the year, or at least once a week. For the most part, though, the majority of respondents were interacted with TSB staff in one way or another on between 5 and 19 occasions. Table 3.14 summarises the number of interactions the respondent university staff have had with TSB staff over the past year. The disaggregated data shows there was not much difference between senior and non-senior staff in the level of their

interactions with TSB staff; or at least where they were observed, that the differences were significant. Non-senior university staff were more likely than senior staff not to have had any contact at all with TSB staff. This is not surprising, as senior staff are more likely to be the first point of contact between the university and TSB on programmes or projects from which non-transactional interactions are developed. On the other hand, senior staff were also more likely than non-senior staff to have had the most frequent interactions with TSB staff. Here too, the difference in the scale of interactions between senior and non-senior staff may be related to the reasons for the contact between the university and TSB, in the first place; for example, the university's involvement in a TSB programme.

Table 3.14 Scale of interaction between university and TSB staff

	Percentages of all respondents		
	Total	Senior	Non-Senior
0	2	0	4
1-4	16	16	17
5-9	30	26	33
10-19	26	26	25
20-34	7	5	8
35-49	2	5	0
50+	16	21	13
Number of respondents (rate= %)	43	19	24

Source: PACEC Survey of University Staff, 2012 (Q1)

3.2.2 The survey next explored the purpose of the non-transactional interactions. The respondents' motivations were assessed on a four-point Likert scale, which ranged from 'not at all important' to 'critical'. Table 3.15 summarises the views of respondents, and shows that a large majority were hoping their contact with TSB staff would enable them gain a better understanding of TSB's research priorities. Four out of five respondents (79%) considered this to be either very important or even critical. In the same vein, three out of four (74%) hoped their interactions with TSB staff would help them develop their proposals for TSB programmes and the related funding; while two out of three (68%) hoped the contact would make TSB more aware of research being carried out at their university. Closely associated with this was the hope of the respondents that the contact would help TSB understand the funding needs of the university; in particular the financial help required to enable them develop and bring the products of university research to market. Three out of five respondents (62%) considered this to be a very important or critical reason behind their interactions with TSB staff. A slightly lower proportion than this (59%) hoped their contact with TSB staff would provide them an insight of the latest developments in TSB programmes. It is also notable that more than half of the respondents (54%) were looking to influence TSB strategy by helping to shape the organisation's programmes. It is also notable that at this stage less than half the respondents were looking to use their contact with TSB to help them find business partners with whom to collaborate on knowledge

exchange. Only around two-fifths of respondents (42%) thought this was a very important or critical motivation for their interactions with TSB staff.

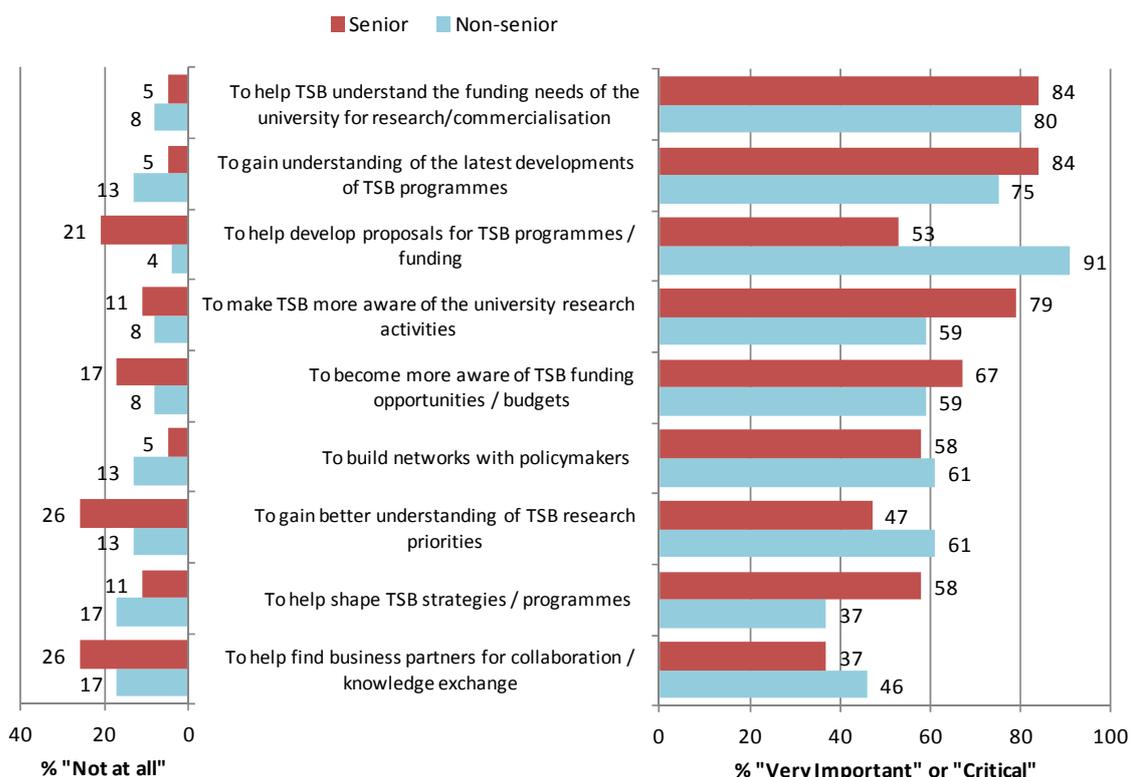
Table 3.15 University staff motivations for non-transactional interactions with TSB

	Percentages of all respondents					Number of respondents
	Not at all important	Somewhat important	Very important	Critical	Very important or critical	
To help TSB understand the funding needs of the university for research/commercialisation	12	26	48	14	62	42
To help develop proposals for TSB programmes / funding	12	14	50	24	74	42
To help shape TSB strategies / programmes	19	26	40	14	54	42
To gain understanding of the latest developments of TSB programmes	10	31	45	14	59	42
To help find business partners for collaboration / knowledge exchange	21	37	30	12	42	43
To build networks with policymakers	14	40	35	12	47	43
To gain better understanding of TSB research priorities	9	12	56	23	79	43
To make TSB more aware of the university research activities	9	23	47	21	68	43
To become more aware of TSB funding opportunities / budgets	7	12	63	19	82	43

Source: PACEC Survey of University staff 2012

3.2.3 Further analysis of the responses from the survey showed considerable variation between the senior and non-senior university staff about their respective motivations for the interactions with TSB staff. Figure 3.7 is a graphical presentation of the motivations of the two groups of staff. The differences are, in the main, a reflection of the strategic role that senior and non-senior staff may be expected to bring to their dealings with the TSB. In this regard, senior university staff were more likely than non-senior to be consider their involvement to: help TSB to understand the funding needs of the university for the commercialisation of research (84% v 80%, respectively); gain understanding of the latest developments of TSB programmes (84% v 75%); make TSB more aware of the university research activities (79% v 59%); become more aware of TSB funding opportunities and budgets (67% v 59%); and to help shape TSB strategies and programmes (58% v 37%). By contrast, non-senior university staff were more likely to be motivated by the practical aspects of the funding and delivery of their university research. Thus, nine out of ten non-senior staff (91%) compared with just over half of senior staff (53%), hoped their involvement with TSB would help them develop proposals for TSB programmes. Similarly, more non-senior than senior staff hoped to: gain better understanding of TSB research priorities (61% v 47%, respectively); and to help find business partners for collaboration in knowledge exchange (46% v 37%).

Figure 3.7 Motivations for interactions, by position within university



Source: PACEC Survey of University staff 2012

3.2.4 The survey next explored the methods by which respondents initiated their non-transactional interactions with TSB staff, as well as the mechanisms through which these took place. The former included the mode of contact, and the latter, the type of engagement. With regard to method, the survey evidence suggests that university staff considered a direct contact initiated by they themselves as the most important means by which they started the non-transactional interactions with TSB staff.

Table 3.16 Importance of methods for initiating non-transactional interactions with TSB staff

	Percentages of all respondents			Number of respondents
	Not at all important	Somewhat important	Very important	
Direct contact initiated by you	5	22	73	41
Direct contact initiated by TSB staff	7	32	61	41
Referral from academic colleague	32	46	22	41
Referral from business	29	34	37	41
Mutual contact (e.g. informal meeting at event)	9	33	58	43
Through Research Councils	34	32	34	41

Source: PACEC Survey of TSB staff 2012

3.2.5 As can be seen from Table 3.16, around three-quarters of the respondents (73%) cited this method as very important. The next most important method was contact

going the other way, and initiated by TSB staff. Three-fifths of respondents (61%) considered this to be very important for the non-transactional interactions. A slightly lower proportion of respondents than this (58%) believed contact was often initiated on a mutual basis; for example, with university and TSB staff meeting informally at an event. The least important means of engagement was through a referral from an academic colleague. Only one in five respondents (22%) described this method as very important. Indeed a third of the respondents (32%) considered such referral as not at all important for their interactions with TSB staff.

3.2.6 As might be expected, there were differences between senior and non-senior staff on the importance of the methods of contact with TSB staff, when the responses were analysed further. For example, more than four-fifths of senior staff (83%), compared with two-thirds of non-senior staff (65%), described a direct contact initiated by themselves as very important for the non-transactional interaction. On the other hand, whilst almost three out of five non-senior staff (57%) indicated that a referral from business was very important for initiating the interaction with TSB, only one in ten senior staff (11%) took the same view. This is significant, and suggests there may be a lower level of relationship, or less frequent contact between senior university staff and businesses.

3.2.7 The next level of inquiry was about the mechanisms through which the respondent university staff engaged with TSB staff on non-transactional interactions purposes. These covered a wide range of activities such as meetings and conferences. Table 3.17 summarises their responses.

Table 3.17 Mechanisms for engaging with TSB staff for non-transactional interactions purposes

	Percentages of all respondents		
	Total	Senior	Non-Senior
Meetings with TSB staff (no business present)	70	68	71
Meetings with both business and TSB staff present	65	47	79
Conferences / events / workshops	65	79	54
Engagement with TSB staff through advisory boards	37	37	38
Secondments at TSB	16	5	25
Telephone / email exchanges	81	84	79
Number of respondents (rate= %)	43	19	24

Respondents could select more than one option; so percentages in any column may sum to more than 100
Source: PACEC Survey of University Staff, 2012 (Q4)

3.2.8 Perhaps unsurprisingly, telephone and email exchanges were well to the fore, as the most frequently used means by which the large majority of staff engaged with TSB staff. Four out of five respondents (81%) indicated that they carried out their interactions through telephone calls and emails. The next most frequently used means of engagement was the one-to-one meetings between university staff and individual TSB staff. Almost three-quarters of respondents (70%) engaged with TSB

staff in this way. This was followed by meetings with TSB staff, but with business staff also attending, and at events such as conferences and workshops (65% of respondents in each case). More than a third of respondents (37%) indicated that they engaged with TSB staff through advisory boards and other such forums in which they participated. It is important to note that one in six university staff (16%) had been on secondment or involved on joint work with TSB at some time for a short period and mainly on specific projects.

3.2.9 Table 3.17 also highlights some differences between senior and non-senior university staff in the way that they engage with TSB staff. It is notable, for example, that four out of five non-senior staff (79%) engaged with TSB staff at meetings at which somebody from business was also present, compared with fewer than half of senior staff (47%) who engaged in this way. Moreover, this was statistically significant. Their positions were reversed, in the case of conferences and events, where senior staff (79%) were one-and-a-half times more likely than non-senior staff (54%) to engage with TSB staff. Again, this may reflect the difference in the level of expertise between senior and non-senior staff, in the sense that senior staff are the more likely to be invited to participate in such activities.

3.2.10 When they were asked to do so, almost two-fifths of respondents (37%) cited telephone and email exchanges as the main mechanism for engaging with TSB staff for non-transactional interactions. Just under a third (30%) indicated that their one-to-one meeting with TSB, with no business present, was the main means of engagement. See Table 3.18.

Table 3.18 Main mechanism for engaging with TSB staff

	Percentages of all respondents		
	Total	Senior	Non-Senior
Meetings with TSB staff (no business present)	30	37	25
Meetings with both business and TSB staff present	14	11	17
Conferences / events / workshops	9	11	8
Engagement with TSB staff through advisory boards	7	5	8
Telephone / email exchanges	37	32	42
Other	2	5	0
Number of respondents (rate= %)	43	19	24

Source: PACEC Survey of University Staff, 2012 (Q4)

3.2.11 It could be argued that a certain degree of non-transactional interaction between university and TSB staff is inevitable, not least because university staff are either currently involved in a TSB programme, or have been involved in such a programme in the past three years or so. The issue here is that it is often difficult to separate many of the observed non-transactional interactions from those that are related to a specific programme. The survey sought to find out to what extent the respondent university staff have been involved in any of the TSB's programmes and initiatives in

the past three years. The results were mixed, as can be seen from Table 3.19. More than half of the respondents indicated they had been involved in Knowledge Transfer Networks (56%), Knowledge Transfer Partnerships (54%), Collaborative R&D (51%) and Grant for R&D (51%). Most of these programmes relate to the commercial exploitation of the results of research, to some degree, in higher educational institutions, apart from GRD which is aimed directly at businesses. In addition to these, around two-fifths of respondents had also been involved in Innovation Platforms (41%) and Innovation Centre (38%) initiatives. About one in five had some involvement in TSB's International programmes (23%) and the Small Business Research Initiative (21%).

3.2.12 On the whole, non-senior university staff were more likely than senior staff to be involved in the range of TSB programmes and initiatives. In particular, non-senior staff were significantly more likely to participate in Grant for R&D and in the Small Business Research initiative. In terms of GRD, funding is not directly provided to academics. However, they could have been involved where a university spin out / business start-up was involved, they assisted a firm's bid for funding or advised a business that had a grant. See Table 3.19.

Table 3.19 University staff involvement in TSB programmes in the past three years

	Percentages of all respondents		
	Total	Senior	Non-Senior
Grant for R&D	51	24	73
Collaborative R&D	51	47	55
Knowledge Transfer Partnerships	54	47	59
Knowledge Transfer Networks	56	53	59
Catapult Technology and Innovation Centres	38	41	36
Small Business Research Initiative	21	6	32
Innovation platforms	41	47	36
International programmes	23	12	32
Other	8	12	5
Number of respondents (rate= %)	39	17	22

Respondents could select more than one option; so percentages in any column may sum to more than 100
Source: PACEC Survey of University Staff, 2012 (Q5)

3.2.13 It was difficult to say with any degree of certainty how much time the respondent university staff were spending on the non-transactional interactions with TSB staff. Even where they had regular contact with TSB staff, the respondents were only able to provide guesstimates of the time they devoted to the interactions. On average, respondents estimated they spent about three percent of their time on the meetings and other activities. Senior staff spent on average 2.4% of their time, and non-senior staff, 4.2% of their time. It was notable, though, that a small minority of respondents were devoting a considerable amount of time to the non-transactional activities and up to a quarter for a small number of non-senior staff. This time could well overlap with time spent on grant applications on programmes which strictly speaking is

transactional activity. The maximum amount of their time spent by any of the respondent senior staff interviewed was about 10%.

3.3 The benefits of interaction

3.3.1 One of the key aims of this study is to gain an understanding of how these interactions stimulate innovation and the commercialisation of the outputs from research among businesses. Consequently, the survey with university staff explored their views on the perceived benefits from the non-transactional interactions. It was necessary, first of all, to gauge how important the respondents believed their contacts with TSB staff were, within their wider networks of people who were instrumental in helping them in their wider research and knowledge exchange objectives. The issue here is how much value university staff place on their relationship with TSB staff, within the context of their overall research work. When they were asked directly, almost half of the respondents claimed that their contacts with TSB staff were very important (26%) or even critical (21%) for their overall research and knowledge exchange work. One in four thought that their contacts with TSB were only somewhat important (24%), while more than one in ten (12%) did not think such contacts were at all important for their research work (see Table 3.20). On the whole, senior staff were slightly more likely than non-senior staff to describe their contacts with TSB to be very important or critical for their overall research. This may be related to the fact that senior university staff are often responsible for managing the programmes of research that invariably requires some level of engagement and interaction with TSB staff.

Table 3.20 Importance of contacts with TSB within wider networks of university staff research and knowledge exchange

	Percentages of all respondents		
	Total	Senior	Non-Senior
Not at all important	12	17	8
Somewhat important	24	22	25
Moderately important	17	11	21
Very important	26	33	21
Critical	21	17	25
Number of respondents (rate= %)	42	18	24

Source: PACEC Survey of University Staff, 2012 (Q7)

3.3.2 The survey next sought to find out what respondents believed to be the main benefits from the non-transactional interactions. They were asked, first, about the benefits for their university and their own academic activities, including teaching, research and knowledge transfer. They were asked to assess the perceived benefits on a four-level impact scale – no impact, low, medium and high impact. The results are presented in Table 3.21. On the whole, the majority of respondents believed there was a wide range of benefits to their university from their non-transactional interactions with TSB staff. As can be seen from the table, at least four out of five

respondents believed that there was medium or high impact from: improving their understanding of the TSB funding available for research (86%); improving their knowledge of key research areas of national importance (84%); improving their ability to apply for TSB funding (83%); and improving their understanding of TSB innovation policies (81%). Another three-quarters of respondents believed that the interactions had improved their university's understanding of TSB's innovation policies (75%), or had given their university a better understanding of some of the uncertainties surrounding TSB's funding of programmes (73%). For some respondents, the benefit for their university from the interactions could be found in the development of new or better relationships with businesses. For example, two-thirds of respondents were convinced that the interactions with TSB staff had enabled their university improve its culture towards engaging with businesses (65%); or helped them find appropriate partners in business (65%), and helped them improve their understanding of the needs of business (64%).

Table 3.21 Main benefits to the university from non-transactional interactions with TSB

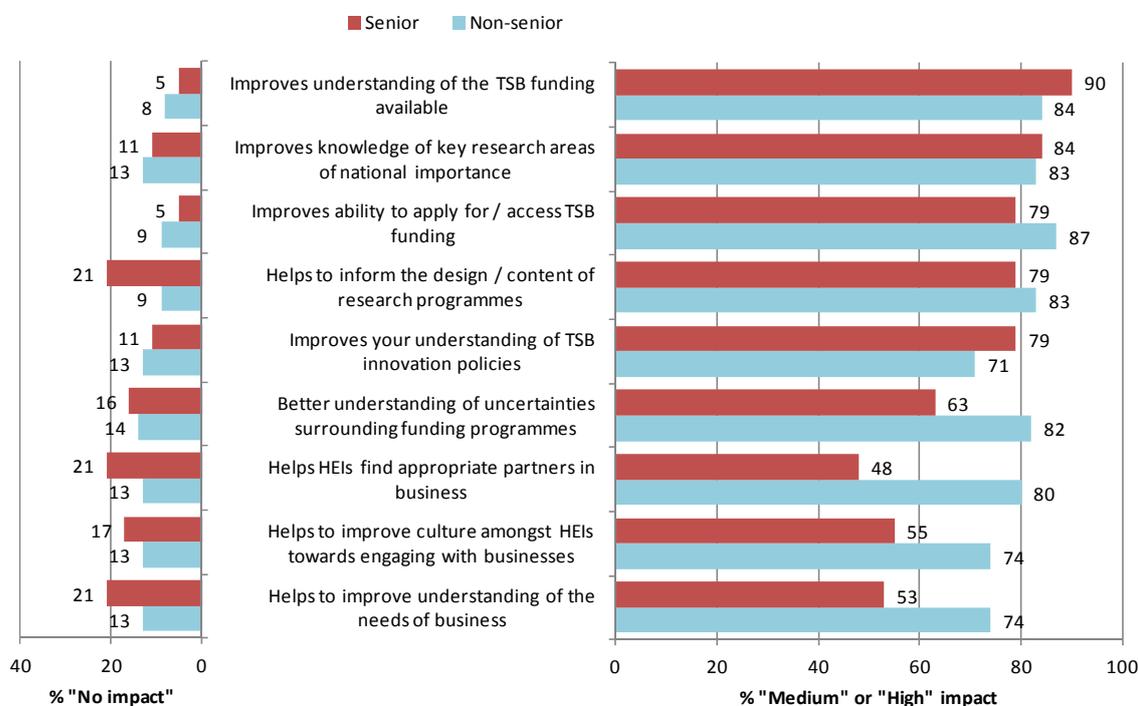
	Percentages of all respondents					Number of respondents
	No impact	Low impact	Medium impact	High impact	Medium or high impact	
Improves understanding of the TSB funding available:	7	7	26	60	86	43
Improves knowledge of key research areas of national importance:	12	5	33	51	84	43
Improves ability to apply for / access TSB funding:	7	10	19	64	83	42
Helps to inform the design / content of research programmes:	14	5	33	48	81	42
Improves your understanding of TSB innovation policies:	12	14	28	47	75	43
Better understanding of uncertainties surrounding funding programmes:	15	12	34	39	73	41
Helps to improve culture amongst HEIs towards engaging with businesses:	15	20	41	24	65	41
Helps HEIs find appropriate partners in business:	16	19	37	28	65	43
Helps to improve understanding of the needs of business:	17	19	38	26	64	42

Source: PACEC Survey of university staff 2012

3.3.3 Further analysis of the data did not show large differences between the senior and non-senior staff interviewed across a wide range of the perceived benefits to their university from the non-transactional interactions. As can be seen from Figure 3.8, the significant differences between the views of senior and non-senior staff related mainly to the perceived benefits from the relationship with business. Non-senior staff appeared to be more optimistic than senior staff that the interactions with TSB staff had helped their university find appropriate partners in business (80% v 48%,

respectively); or improved the culture towards engaging with business (74% v 55%); or helped improve understanding of the needs of business (74% v 53%).

Figure 3.8 Main benefits of interactions to HEIs, by senior and non-senior university staff



Source: PACEC survey of university staff 2012

3.3.4 Where there were perceived to be significant benefits to the university arising from the interactions, these appeared to be linked directly to particular individuals at TSB, rather than to the organisation itself. Thus, some respondents attributed the benefits to “the personal good working relationship with TSB staff with a background in industry and science research”. Other respondents cited TSB staff they described as “ex-industry people who have worked in the aligned technology”; while other TSB staff were said to be “people who care and are able to interact with the business centres of universities”.

3.3.5 The survey sought to establish the additionality of the benefits; in other words, to what extent the perceived benefits could still have been realised even in the absence of any non-transactional interactions between university and TSB staff. Table 3.22 shows that very few respondents (3%) believed the benefits to the university would definitely have been realised without the interactions between the university and TSB staff. On the contrary, one in three respondents (32%) were convinced the benefits would definitely not have been realised in the absence of their interactions with TSB. Even where they were slightly hesitant, one in five respondents (19%) still believed the benefits would probably not have occurred without the interactions with TSB staff.

3.3.6 There were notable differences between senior and non-senior university staff about the additionality of the benefits to higher educational institutions. Senior staff were

significantly more likely than non-senior staff to attribute the benefits to the interactions. Thus, whilst half the senior staff (50%) were convinced the benefits would definitely not have occurred, only a fifth of non-senior staff (19%) took a similar view.

Table 3.22 Realising the benefits to universities in the absence of non-transactional interactions with the TSB

	Percentages of all respondents		
	Total	Senior	Non-Senior
Definitely would have been realised	3	0	5
Probably would have been realised	16	13	19
Possibly would have been realised	30	19	38
Probably would not have been realised	19	19	19
Definitely would not have been realised	32	50	19
Number of respondents (rate= %)	37	16	21

Source: PACEC Survey of University Staff, 2012 (Q10)

3.3.7 The respondents were next asked about what they believed were the main benefits to the TSB itself arising from the non-transactional interactions. Their responses are set out in Table 3.23.

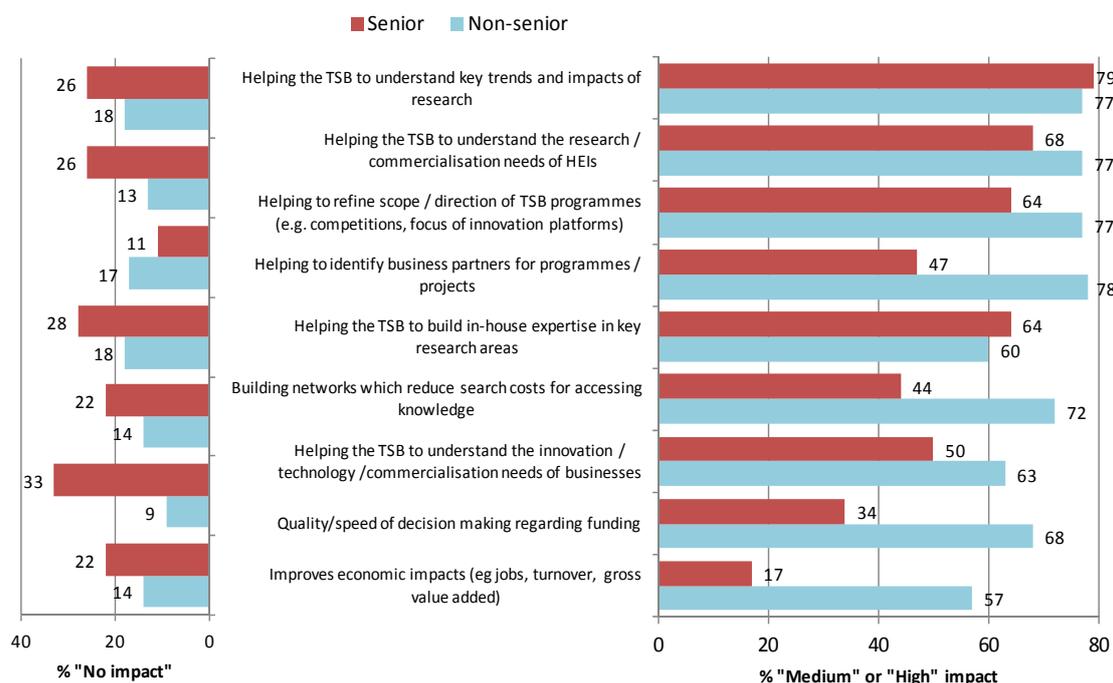
Table 3.23 Main benefits to the TSB from non-transactional interactions with universities

	Percentages of all respondents					Number of respondents
	No impact	Low impact	Medium impact	High impact	Medium or high impact	
Helping the TSB to understand key trends and impacts of research	12	10	17	61	78	41
Helping the TSB to understand the research / commercialisation needs of HEIs	7	20	27	46	73	41
Helping to identify business partners for programmes / projects	19	17	24	40	64	42
Helping the TSB to build in-house expertise in key research areas	14	24	24	38	62	42
Helping to refine scope / direction of TSB programmes (e.g. competitions, focus of innovation platforms)	22	7	37	34	71	41
Helping the TSB to understand the innovation / technology /commercialisation needs of businesses	18	25	25	33	58	40
Quality / speed of decision making regarding funding	20	28	23	30	53	40
Building networks which reduce search costs for accessing knowledge	23	18	35	25	60	40
Improves economic impacts (e.g. jobs, turnover, gross value added)	18	44	18	21	39	39

Source: PACEC Survey of university staff 2012

- 3.3.8 On the whole, the majority of respondents believed that TSB also derived significant benefits from the interactions between TSB and university staff. The most notable benefits, cited by at least seven out of ten respondents, were: helping TSB to understand the key trends and impacts of research being carried out in the universities (78%); or helping TSB to understand the specific needs of HEIs seeking to commercialise their research (73%); or helping TSB refine the scope and direction of its programmes on innovation (71%). Three out of five respondents also perceived TSB as benefiting from the contacts with university staff which enable it to identify business appropriate partners for its programmes and projects (64%); or which help the organisation build up its in-house expertise in key research areas (62%); or which enable the organisation build up networks that help reduce the cost of accessing innovation and knowledge (60%). More than half of respondents also thought the interactions helped TSB to better understand the innovation and commercialisation needs of businesses (58%); and helped to improve the quality and speed of its decision-making process regarding funding (53%). Only a minority of respondents thought the interactions had any direct economic impacts on TSB, such as improvements in jobs and business turnover.
- 3.3.9 On the whole, senior university staff were more pessimistic than non-senior staff about the benefits to TSB from the non-transactional interactions. As can be seen from Figure 3.9, senior staff were less likely to cite the perceived benefits from the interactions, compared with non-senior staff. In some cases, the differences between the two groups were quite substantial: for example in the quality and speed of decision-making (34% of senior staff v 68% of non-senior staff); helping to identify business partners for projects (47% v 78%, respectively); and building networks to reduce the cost of accessing knowledge (44% v 72%).
- 3.3.10 Respondents who believed there were significant benefits to the TSB from the interactions also thought that the particular TSB staff likely to gain most, were the project managers, policy staff, knowledge transfer staff, and business engagement staff.
- 3.3.11 In terms of additionality of benefits to TSB, two-fifths of the respondents (42%) believed these would probably or definitely not have been realised in the absence of the interactions (18% and 24% of respondents, respectively). As can be seen from Table 3.24, only about one in ten thought the benefits to TSB would probably or definitely been realised (6% in each case). It is again clear from the table that senior staff interviewed were more convinced about the beneficial impact of the interactions to the TSB than the non-senior staff. More than half of the senior staff (53%) were convinced that the benefits to the TSB would not have been realised, compared with a third of non-senior staff (31%).

Figure 3.9 Main benefits to TSB from non-transactional interactions, by senior and non-senior university staff



Source: PACEC survey of university staff 2012

Table 3.24 Realising the benefits to the TSB in the absence of non-transactional interactions with university staff

	Percentages of all respondents		
	Total	Senior	Non-Senior
Definitely would have been realised	6	7	5
Probably would have been realised	6	0	11
Possibly would have been realised	47	40	53
Probably would not have been realised	18	33	5
Definitely would not have been realised	24	20	26
Number of respondents (rate= %)	34	15	19

Source: PACEC Survey of University Staff, 2012 (Q13)

3.3.12 The survey sought to find out about the probable benefits to businesses from non-transactional interactions between university and TSB staff. On the whole, there was greater consistency in the views of respondents about the overall benefits to businesses from the interactions. At least seven out of ten respondents believed that businesses had derived significant benefits, to the extent that they considered the scale of the impact to be medium to high. More specifically, around four-fifths (78%) thought the interactions had helped businesses access new ideas and gained different perspectives across a wide range of subject areas. A similar proportion (77%) thought the interactions had made educational institutions better at targeting research to the needs of business. Perhaps even more important, businesses have

also been enabled to find appropriate partners in higher educational institutions with whom to collaborate on projects (75%). In this way respondents believed university research had become more relevant for commercialisation and business growth (73%), improved business innovation skills and practices (73%), and improved the ability of businesses to overcome technology and innovation issues (73%). An added benefit is that the resulting collaboration had increased the ability of businesses to access TSB funding (71%). Far fewer respondents, though, believed the interactions had necessarily led to improvement in business performance. See Table 3.25.

Table 3.25 Main benefits to businesses from non-transactional interactions between university and TSB staff

	Percentages of all respondents					Number of respondents
	No impact	Low impact	Medium impact	High impact	Medium or high impact	
Helps businesses find appropriate HEI research / collaborative partners:	13	13	25	50	75	40
Helps businesses access new ideas / different perspectives / multidisciplinary areas	13	10	28	50	78	40
Makes HE research more relevant for commercialisation and business growth	15	12	24	49	73	41
Research in HEIs becomes better targeted to the needs of business	15	8	33	44	77	39
Improves the ability of businesses to overcome innovation / technology issues	15	13	30	43	73	40
Helps to improve the culture amongst businesses towards engaging with HEIs	15	15	35	35	70	40
Ability of businesses to apply for / access TSB funding	15	15	38	33	71	40
Improves businesses innovation skills and practices	20	8	45	28	73	40
Improves business performance:	24	22	35	19	54	37

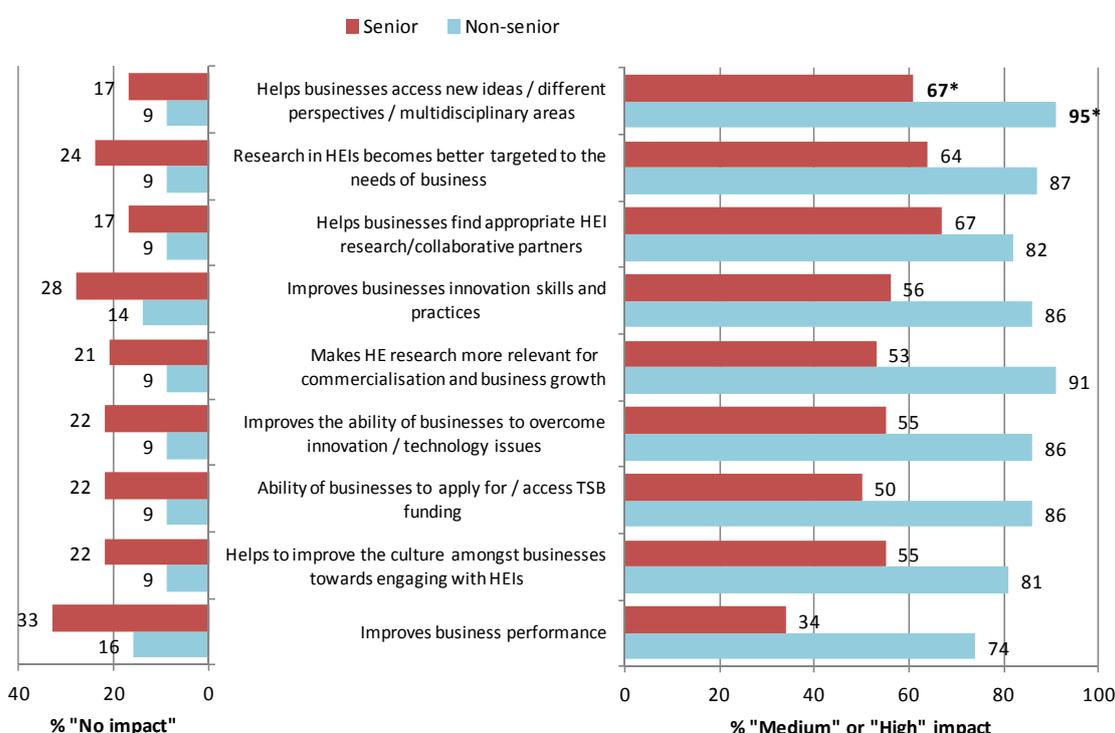
Source: PACEC Survey of university staff 2012

3.3.13 Further analysis of the data showed there was considerable difference between the senior and non-senior staff interviewed in their perceptions about the benefits to businesses from the non-transactional interactions. It can be seen from Figure 3.10 that across the entire range of perceived benefits, non-senior university staff tended to be more optimistic than senior staff in describing the impact on businesses as medium to high. In some instances the differences between the groups were not only large, but also significant. For example, more than nine out of ten non-senior staff (95%) believed that the interactions had helped businesses access new ideas and perspectives in different disciplines, compared with two-thirds of senior staff (67%). The difference here was statistically significant. The other notable differences in perception included: making university research more relevant for commercialisation and business growth (91% of non-senior staff v 53% of senior staff); increasing the

ability of businesses to apply for TSB funding (86% v 50%, respectively); improving the ability of businesses to overcome innovation and technology issues (86% v 55%); improving business innovation skills and practices (86% v 56%); and helping to improve the culture amongst businesses towards engaging with universities (81% v 55%).

3.3.14 Another way of looking at the difference between senior and non-senior staff about the benefits to businesses is their view about whether they thought the interactions had made any impact at all. Again, Figure 3.10 shows that senior staff were consistently more likely than non-senior staff to consider the perceived benefits had not materialised at all.

Figure 3.10 Main benefits to businesses from non-transactional interactions, by senior and non-senior staff



Source: PACEC survey of university staff 2012

3.3.15 Where the respondents thought there were significant benefits to businesses from the interactions, they described some of these as based on a relationship that is conducted without TSB involvement. For example, some universities have excellent relationships with multinational commercial organisations, some of who fund doctoral programmes at particular university departments and schools. Respondents nevertheless acknowledged the positive role that TSB staff play. These include “providing a needed catalyst for universities to work with external business partners”; or “enabling businesses to access universities that they did not know about”; or “helping businesses to make a useful connection to a particular university”; or “having a good knowledge of a university’s capability towards business”. Respondents also highlighted the role of senior managers in particular who know policy, understand markets and research and are, therefore, able to have an overall view of all aspects

of relationship between universities and businesses, and can inform and deal with businesses sensibly. In this way, TSB staff are able to help businesses “structure better projects for business growth”.

- 3.3.16 As with the other partners, the survey considered the additionality of benefits to businesses from the non-transactional interactions. The views of the respondents were more highly polarised here than when they considered the additionality of benefits to universities and the TSB itself. As can be seen from Table 3.26, exactly one-third of the respondent university staff (33%) believed that the benefits to businesses described above would not have materialised without the level of interactions between university and TSB staff. Only one in ten, though, were convinced that the benefits would definitely not have been realised in the absence of non-transactional interactions between university and TSB staff. It is particularly noticeable that the respondents were more inclined to attribute the perceived benefits to businesses to the interactions, with only few (6%) convinced that the benefits would have definitely or probably realised.

Table 3.26 Realising the benefits to the businesses in the absence of non-transactional interactions with the TSB

	Percentages of all respondents		
	Total	Senior	Non-Senior
Definitely would have been realised	0	0	0
Probably would have been realised	6	8	6
Possibly would have been realised	61	46	72
Probably would not have been realised	23	38	11
Definitely would not have been realised	10	8	11
Number of respondents (rate= %)	31	13	18

Source: PACEC Survey of University Staff, 2012 (Q16)

3.4 Constraints and improvements to effectiveness

- 3.4.1 The evidence presented in the previous section clearly showed that the respondent university staff had no doubt that their non-transactional interactions with TSB staff had positive benefits for all three partners involved in the innovation process. Moreover, these benefits were considered as additional, in the sense that they would not have occurred without those interactions. Given the perceived benefits, it is not surprising that the TSB was interested in how it could better use and improve its links with universities to stimulate innovation and commercialisation of research amongst businesses.
- 3.4.2 The starting point in the development of measures to improve upon university-TSB interactions is to establish an effectiveness means of engagement. In the survey, respondents were asked their views about which types of mechanisms were most effective in delivering the benefits they had outlined earlier. It is important to point out here that some respondents would not express a view on some of the mechanisms, either because they had not used them, or had no experience of them. The

responses of those who were prepared to express a view are presented in Table 3.27. Three modes of interaction stood out as being considered very effective for delivering the benefits of interaction. Almost half of the respondents (48%) rated meetings with both business and TSB staff present as very effective. Two-fifths also considered one-to-one meetings with TSB staff (41%) and telephone and email exchanges (40%) to be very effective. More than a quarter also thought that conferences, workshops and other such events (29%) were very effective in delivering the benefits from interactions. One in five (18%) indicated that interactions at advisory board and steering group meetings were very effective, although it is worth noting that more than (a word missing here?) of the respondents could not express a view one way or another this mode of engagement. Very few respondents had gone on secondment to the TSB, or had experience of such secondment. Consequently, only around one in ten (8%) would describe secondments to the TSB as very effective.

3.4.3 In terms of scale (of effectiveness), it is worth noting here that half the respondents rated conferences and such events as generally effective (49%). About a quarter or so also considered joint meetings with businesses and TSB staff (28%), one-to-one meetings with TSB (26%) and advisory boards and steering groups (26%) as generally effective. On the whole, only a small proportion of the respondents considered that the methods of engagement were not so effective.

Table 3.27 Effectiveness of mechanisms in delivering the benefits

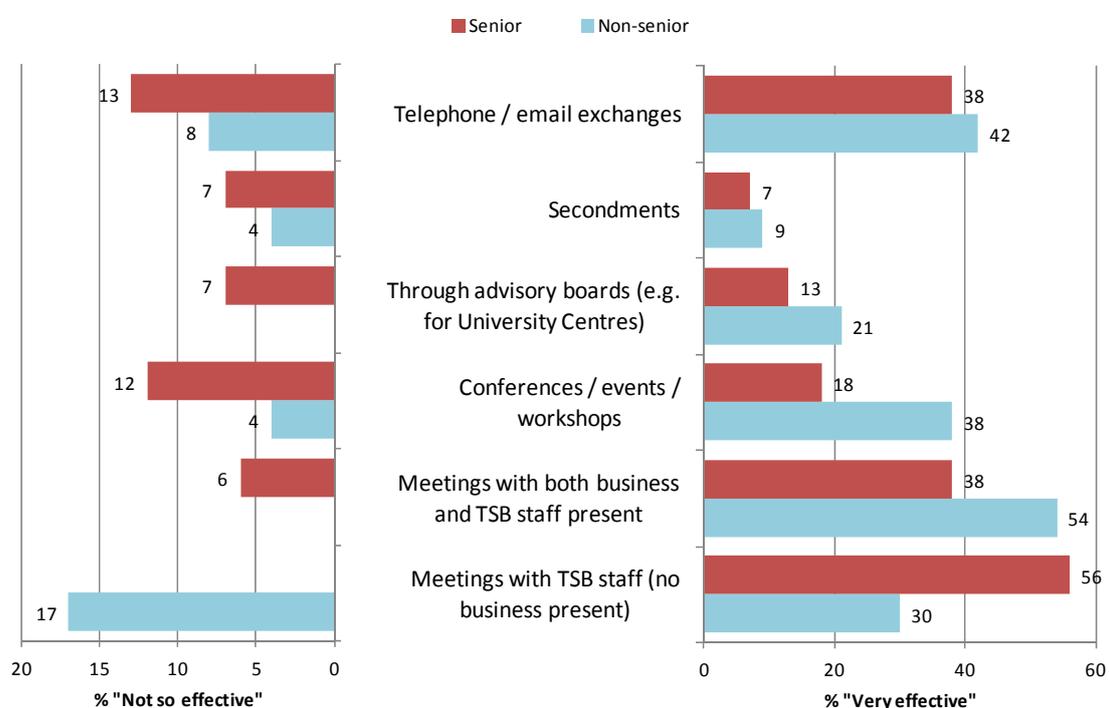
	Percentages of all respondents				
	Very effective	Generally effective	Not so effective	n/a	Number of respondents
Meetings with TSB staff (no business present):	41	26	10	23	39
Meetings with both business and TSB staff present:	48	28	3	23	40
Conferences / events / workshops:	29	49	7	15	41
Through advisory boards (e.g. for University Centres):	18	26	3	54	39
Secondments:	8	3	5	84	38
Telephone / email exchanges:	40	43	10	8	40

Source: PACEC Survey of university staff 2012

3.4.4 Further analysis of the responses highlighted some differences between the views of senior and non-senior staff. Most notably, almost three-fifths of senior staff (56%) considered their one-to-one meetings with TSB staff as very effective, almost twice the proportion of non-senior staff (30%) who took a similar view. On the other hand, more than half of non-senior staff (54%), but just under two-fifths of senior staff (38%) rated the joint meetings with TSB and business staff as very effective. At the other end of the spectrum, senior staff were more likely than non-senior staff to consider telephone and email exchanges, and conferences and events as not so effective. See Figure 3.11.

3.4.5 Looking still at how to improve the links between higher educational institutions and the TSB, the survey sought to identify the specific constraints to non-transactional interactions with universities. The respondent university staff were asked their views on which of a range of factors currently limit their ability to realise benefits from their interactions with TSB. Their responses are set out in Table 3.28. It is immediately clear from the table that respondents, on the whole, did not think they faced significant constraints when interacting with TSB staff. More specifically, at least nine out of ten did not consider their relationships with TSB staff were constrained at all because the benefits from interaction were sufficient enough (97%); or that TSB staff were not willing to engage (90%); or because of lack of support to engage with the TSB (90%); or because of lack of co-ordination with other university staff (90%).

Figure 3.11 Effectiveness of delivery mechanisms, by senior and non-senior staff



Source: PACEC survey of university staff 2012

3.4.6 The most severe constraints on the ability of respondents to interact with TSB staff related to time availability. Of particular significance, in this regard, was the impact on their academic duties because of the time demands of the interactions. Almost half of the respondents (48%) indicated that their research and teaching duties were of higher priority. Consequently, it was perhaps not surprising that half of respondents (48%) also suggested that their non-transactional interactions were necessarily constrained by lack of time to engage fully with TSB staff. On the other hand, a third of respondents (34%) thought the time constraint problem emanated the other way; and that it was rather TSB staff that did not appear to have time to engage with university staff. One in four respondents (25%) cited difficulties in identifying the appropriate TSB staff, and a fifth (20%), difficulties in making contact with the appropriate TSB staff. It is also notable that almost one in five respondents (18%) did

not think university staff understood clearly the needs of businesses. A smaller but still significant proportion of respondents (15%) did not think the overarching aim of the non-transactional interactions, to bring the benefits of research to businesses, were as clear or certain. See Table 3.28.

Table 3.28 Factors limiting the ability to realise benefits from non-transactional interactions between TSB and university staff

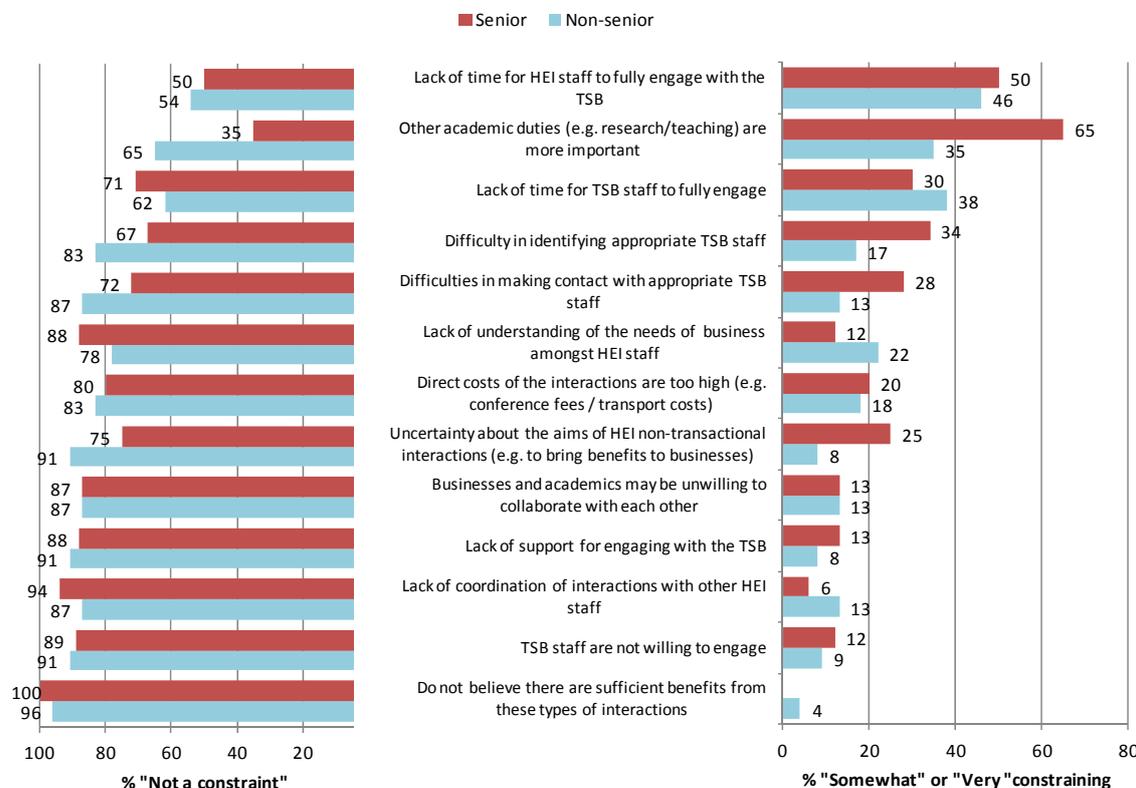
	Percentages of all respondents				Number of respondents
	Not a constraint	Somewhat constraining	Very constraining	Somewhat or very constraining	
Other academic duties (e.g. research / teaching) are more important?	53	33	15	48	40
Lack of time for HEI staff to fully engage with the TSB	52	31	17	48	42
Lack of time for TSB staff to fully engage?	66	29	5	34	38
Difficulty in identifying appropriate TSB staff	76	20	5	25	41
Difficulties in making contact with appropriate TSB staff	80	15	5	20	41
Direct costs of the interactions are too high (e.g. conference fees / transport costs)	82	13	5	18	38
Lack of understanding of the needs of business amongst HEI staff	83	13	5	18	40
Uncertainty about the aims of HEI non-transactional interactions (e.g. to bring benefits to businesses)	85	10	5	15	39
Businesses and academics may be unwilling to collaborate with each other	87	13	0	13	38
Lack of support for engaging with the TSB	90	8	3	11	39
Lack of coordination of interactions with other HEI staff	90	10	0	10	39
TSB staff are not willing to engage	90	2	7	9	41
Do not believe there are sufficient benefits from these types of interactions	97	3	0	3	39

Source: PACEC Survey of university staff 2012

3.4.7 The evidence from the disaggregated data corroborated the general view that there were only few constraints to non-transactional interactions between university and TSB staff. As can be seen from Figure 3.12, significantly higher proportions of senior and non-senior staff indicated that the range of probable factors they were quizzed about were not a constraint. Except in a few instances, there was not much divergence of view between senior and non-senior staff. The most glaring difference between the two was about the impact of their academic duties on the time senior staff could devote to interactions with TSB staff. Two-thirds of senior staff (65%) faced this constraint, compared with only around a third of non-senior staff (35%). The other differences it is worth noting are: the fact that senior staff (34%) are twice as likely as non-senior staff (17%) to express difficulties in identifying the appropriate TSB staff to deal with as a constraint; and the fact that senior staff (28%) were more likely than non-senior staff (13%) to cite difficulties in making contact with appropriate

TSB staff. These differences may be expected, as senior staff are also the more likely to represent their university department's (or school's) research externally.

Figure 3.12 Constraints to non-transactional interactions, by senior and non-senior staff



Source: PACEC survey of university staff 2012

3.4.8 The university staff interviewed for this research had no doubt that universities form an integral part of the innovation landscape in the UK, and undertake very valuable research that has the potential to support innovation in businesses. They were also convinced that the TSB has an important role to play in supporting businesses through their interaction with universities. Indeed, when they were asked about this latter, the overwhelming majority of the respondent university staff were in no doubt that TSB should continue to play a role in supporting innovation in business through exchange of knowledge between universities and industry. Nine out of ten (89%) believed this was very important or even critical. Only one in ten described this role of TSB as moderately or somewhat important, with none suggesting it was not at all important. Table 3.29 sets out the respondents' views, and shows further that non-senior staff in particular were more convinced, compared with senior staff, that the TSB's role in knowledge exchange was critical. But senior staff were no less sanguine, and more than half of them indicated that the TSB's role, in this respect, was very important.

Table 3.29 Respondents' views about TSB's role in supporting innovation in businesses through university-industry knowledge exchange

	Percentages of all respondents		
	Total	Senior	Non-Senior
Critical	42	26	54
Very important	47	53	42
Moderately important	9	16	4
Somewhat important	2	5	0
Not at all-important	0	0	0
Number of respondents (rate=%)	43	19	24

Source: PACEC Survey of University Staff, 2012 (Q19)

3.4.9 The discussion with university staff was extended to explore their views about the respective roles of TSB, the research councils, and other funders of innovation. The survey sought to find out their views on the relationship between the TSB and the research councils and, particularly, whether they thought the TSB worked effectively with those organisations. On the whole, the respondent university staff appeared to be ambivalent about the TSB's relationship with the research councils and other funders. As can be seen from Table 3.30, fewer than one in ten respondents (7%) thought that the TSB worked very effectively with the research councils and other funders of innovation. Around two-fifths (38%) thought the TSB worked generally effectively with those organisations, and a quarter (24%), quite effectively. It is also notable that one in seven respondents (14%) did not think the TSB worked effectively at all with the research councils; and a slightly higher proportion than this (17%) were not sure.

3.4.10 On the whole, the senior staff interviewed were more likely than non-senior staff to take a more optimistic view about TSB working effectively with the research councils and other funders. Three-fifths of senior staff (61%) thought the TSB worked generally or very effectively with the research councils, compared with only a third of the non-senior staff (33%) who took a similar view. But slightly more non-senior than senior staff (17% v 11%, respectively) thought the TSB did not work effectively at all with the research councils and other innovation funders. See Table 3.30.

Table 3.30 Respondents' views about the TSB working with research councils and other funders of innovation

	Percentages of all respondents		
	Total	Senior	Non-Senior
Very effectively	7	11	4
Generally effectively	38	50	29
Quite effectively	24	11	33
Not effectively	14	11	17
Not sure	17	17	17
Number of respondents (rate=%)	42	18	24

Source: PACEC Survey of University Staff, 2012 (Q20)

3.4.11 The respondents were probed further to elaborate on their views on the relationship between TSB and the research councils. Some highlighted what they considered to be overlaps between the TSB and the research councils. They acknowledged that the TSB was very effective in creating a “funding pot” to facilitate innovation, but argued this was often without regard to whether the research councils were engaged in similar activities. Those respondents advocated better links with research councils in order to avoid such overlaps. There was some concern that there did not appear to be a meeting of minds between TSB and the research councils. The basis for this view was a belief that the research councils supported more strategic applied research that is not necessarily linked to commerce. TSB, by contrast, appeared to be more concerned about whether the research in higher educational institutions was “fit for exploitation”. The general consensus was that the two cultures of “research push” and “business pull” needed to be brought together in joint schemes. Perhaps of greater concern was the view of some respondents about the value placed on research in higher educational institutions. The issue here was a perception that the funding councils did not appear to recognise aspects of TSB funded research in the university’s portfolio in the RAE capability assessment.

3.5 Summary of the Interviews

3.5.1 This section draws on the results from the research with university staff. It summarises the key points from the survey, in terms of the headline findings, to reflect the aims of the project.

Characteristics of respondents

- The institutions included in the survey represented a broad spectrum of universities across the UK, including those ranked in the top 25 for TSB investment and those ranked lower. The respondents themselves included both academic and non-academic staff, but all of whom were involved in knowledge transfer projects. More than two-fifths of these were in a senior position at their university. The respondents were selected following liaison with TSB and university staff.

Nature and scale of interactions with TSB

- The university staff placed considerable store on their interactions with the TSB, at least to the extent that only few had not engaged with TSB staff at all during the intervening year. Some had almost weekly contact with TSB staff, given that they had more than 50 separate non-transactional interactions over the course of the year. On average, the majority of staff interacted with TSB staff at least once every month.
- Senior staff were most likely to engage with TSB staff, which is to be expected, as they tended to take the lead on programmes and other associated activities which give rise to some form of interaction, in the first place.

Purpose of non-transactional interactions

- A large majority of the university staff hoped that their contact with TSB staff would give them a better insight into TSB’s research priorities. They considered this to be a critical pre-requisite to their developing proposals for

TSB programmes and related funding. On the whole, the university staff appeared to be motivated more by ensuring their research was published and less about the commercialisation of their research. Indeed, less than half of them were looking for business partners to collaborate with in knowledge exchange. On the face of it, this appears to contrast very much with the prime motivation of TSB staff to broker relationships between universities and business.

Methods for non-transactional interactions

- The university staff regarded the direct contact they initiated themselves as the most important means of starting any engagement with TSB staff, in the first place. However, a sizeable proportion cited the importance of contact coming the other way, ie contact initiated by TSB staff. Senior staff in particular believed that contacts initiated by them were the most fruitful in producing benefits.
- The evidence also indicated there was frequent contact between university staff and businesses (which on occasion involved TSB), although this appeared to be conducted between non-senior staff and representatives of business. Not surprisingly, non-senior staff were more inclined than senior staff to rate referrals from business more highly as a means of starting engagement with TSB staff. Mutual contact, often informal meetings at events, fell somewhere in-between the two types of direct contact.

Mechanisms for non-transactional interactions

- There is some distinction between the methods of interaction and the mechanisms through which the university staff engaged with TSB staff. Apart from the more frequent email and telephone exchanges, the mechanism most used by the university staff in non-transactional interactions was the one-to-one meetings with TSB staff only. This was closely followed by conferences and other events, and meetings where representatives of business were also present. This latter means of interaction was used more by non-senior staff than senior staff. This raises an issue for policy, about the role TSB can play by using the interactions to help universities find business partners for collaboration and knowledge exchange, ie a brokerage role.

Benefits of interaction

- It was clear from the survey that the university staff valued their relationship with TSB very highly. Almost half of them (47%) were in no doubt that their contacts with TSB staff were important for their overall research and knowledge exchange work. They also believed that their universities benefited directly from the interactions with TSB staff. They perceived wide-ranging benefits, most notably: improving their understanding of TSB funding available for research (86%); improving their knowledge of key research areas of national importance (84%); improving their ability to apply for TSB funding (83%); and improving their understanding of TSB innovation policies (81%). In this regard, the university staff echoed the views of the TSB staff interviewed about the perceived benefits to universities from non-transactional interactions. University staff benefited less in terms of finding appropriate business partners, although two thirds of universities identified this benefit and the fact that the interactions helped them to understand the needs of businesses.
- The university staff did not think the benefits flowed one way only, and that the other stakeholders benefited just as significantly from the non-transactional interactions. The benefits they perceived flowed to the TSB in particular were: improving their understanding of the key trends and impacts of current university research (78%); understanding the research

commercialisation needs of higher education institutions (73%); and helping the TSB refine the scope and direction of its programmes (71%). Again, these were remarkably similar to the views of the TSB staff themselves about the benefits of interaction to their organisation.

- The benefits the university staff perceived to flow to businesses from the non-transactional interactions included: their accessing new ideas and gaining perspectives across a wide range of new subject areas. As well, businesses were thought to benefit from having their needs better targeted by research being undertaken in universities. Even more importantly, the interactions have enabled businesses to find appropriate collaborative partners in universities. The overall beneficial effect was that university research was becoming more relevant for commercialisation and business growth. It is notable that here too, the views of the university staff appeared to corroborate the evidence from the research with TSB staff, about the benefits of non-transactional interactions to business.

Additionality

- On the whole, the university staff believed that the biggest beneficiary of the non-transactional interactions was the TSB itself. This is on the basis of their views about the extent to which the perceived benefits to the different stakeholders would have been realised in the absence of non-transactional interactions, ie the additionality of the benefits. More specifically, half of the university respondents (51%) believed the benefits accruing to the TSB would probably or definitely not been realised on the absence of the interactions. This compares with around two-fifths (42%) who did not think the benefits to universities would have been realised; and exactly one-third (33%) who did not think the same about the benefits to business.

Constraints and improvements to effectiveness

- In terms of the types of interactions that were seen as most effective, the university staff placed slightly more emphasis on meetings where both TSB and businesses were present compared to meetings where no businesses were present. Other mechanisms (such as conferences etc), while considered to be effective, were generally seen as less effective than the meetings.
- On the whole, the university staff did not face significant constraints when interaction with TSB staff. On the contrary, they were acutely aware of the overall benefits from the interactions, and about the willingness of TSB staff to engage with universities. They also had considerable support from their own universities to engage with the TSB. Where there were any constraints at all, these related to time availability, as the respondents had to fit the interactions into their teaching and other academic responsibilities. This often made it difficult for them to fully engage with TSB staff. The only other areas of concern for a minority of the university respondents related to difficulties in identifying and making contact with the appropriate TSB staff. It is worth noting that on the whole, significantly fewer university staff thought they faced any constraints, compared with their TSB counterparts.

4 Survey of Businesses

- 4.1.1 This chapter presents the findings from the interviews with businesses about the value of the non-transactional interactions between TSB and university staff to them. The businesses were asked about their perceptions when they were present at non-transactional discussions between the three parties. They could not comment on TSB university interactions where they were not present. It was particularly important to ascertain from businesses what they considered to be the benefits to them that arise directly or indirectly from interactions and meetings. It is important to point out that the consultations for this stage of the research were necessarily restricted to a relatively small number of businesses that had engaged with the TSB and university departments in the immediate past.
- 4.1.2 A total of fifteen businesses provided full useable responses for the analyses from a total of eighteen interviewed which follow. Some thirty five companies were contacted and those interviewed had participated in non-transactional activities jointly with TSB and universities. In terms of the characteristics of businesses interviewed, more than half of the respondent firms (9 out of 15) were independent businesses with no subsidiaries. One in five (3 out of 15) were independent businesses with subsidiaries, and the rest (3 firms), subsidiaries of UK and overseas-owned businesses. The businesses comprised a mix of very mature, long-established firms, and young, more recently established ones. More specifically, one in five (3 out of 14) started trading before 1980. Around half (7 out of 14) were established between 1980 and the turn of the millennium, and the rest (4 out of 14) between 2002 and 2011. As might be expected, the businesses varied in size, in terms of the number of people they employed. The median number of employees was 30, which suggests that most of the businesses were SMEs. However, the average number of employees was around 7,000, which suggests some of the businesses were very large. Indeed, the largest firm included in the survey employed more than 100,000 people worldwide.
- 4.1.3 One in three of the businesses (5 out of 15) were Research and Development companies. The others were engaged in manufacturing (5 out of 15), business services (2 out of 15), mechanical engineering, and utilities and waste management. Two out of three of the firms (10 out of 15) commenced business as completely new start-ups. The rest were spin-offs from an existing business, and the result of the merger or acquisition of an existing firm.
- 4.1.4 With regard to their business prospects for growth, the majority of the firms (11 out of 15) were looking to grow only moderately. The rest intended to remain the same size, at least in the short to medium term period.

4.2 The Aims of Non-Transactional Interactions with TSB and Universities

- 4.2.1 All the businesses were involved with TSB and university discussions when the three parties liaised together. For half this was relatively frequently and for the remainder it was less so, but not infrequently. Each of the businesses had also liaised independently with TSB and the universities separately. However, the focus of the discussion was on the non-transactional activities where all three parties were present.
- 4.2.2 As with the discussions with TSB and university staff earlier on, the businesses were, similarly, asked about their overall aims and motivations for their non-transactional interactions with the TSB and universities. Their responses, which are set out in Table 4.31, show that the businesses appeared keen to develop and improve their relationship with higher education institutions. In particular, four out of five (80%) indicated it was very important, or even critical to make universities more aware of the research activities being carried out by the businesses themselves. Almost half (47%) had a similar intention, to make the TSB itself more aware of their research. Around half (53%) wanted to use their interactions with the TSB to gain a better understanding of the research priorities of universities, with another third (34%) looking to be similarly apprised of TSB's priorities. More than half (53%) of the respondents indicated they wanted to find out more about the opportunities for TSB funding, and the potential budgets involved. Perhaps unsurprisingly, almost half (47%) were looking to use the opportunities offered by the interactions to find suitable partners for collaboration and exchange of knowledge. More broadly, one in three of the respondents wanted to use the forum of the interactions to gain understanding of the latest developments of university and TSB (research) programmes.

Table 4.31 Business Motivations for Non-Transactional Interactions with TSB and Universities

	Percentages of all respondents					Number of respondents
	Not at all important	Somewhat important	Very important	Critical	Very important or critical	
To help TSB understand the funding needs of businesses	60	33	7	0	7	15
To help develop proposals for TSB programmes / funding	33	40	27	0	27	15
To help develop proposals for HE programmes / funding	40	33	27	0	27	15
To help shape TSB strategies / programmes	60	13	20	7	27	15
To help shape HE strategies / programmes	40	33	27	0	27	15
To gain understanding of the latest developments of TSB programmes	33	33	27	7	34	15
To gain understanding of the latest developments of university programmes	13	53	33	0	33	15
To help find business partners for collaboration / knowledge exchange: TSB/HE	20	33	40	7	47	15

To build networks with policymakers: TSB/HE	27	40	27	7	34	15
To gain better understanding of TSB research priorities	20	47	27	7	34	15
To gain better understanding of HE research priorities	7	40	53	0	53	15
To make TSB more aware of the business' research activities	20	33	40	7	47	15
To make HE aware of the business' research activities	7	13	67	13	80	15
To become more aware of TSB funding opportunities / budgets	13	33	53	0	53	15
To become more aware of HE funding opportunities / budgets	27	47	27	0	27	15

4.2.3 The evidence from the survey suggests that the businesses attached considerable, though not critical, importance to their discussions with the TSB and university staff they had interacted with. Around half (8 out of 15) described these discussions as very important, whilst the other half (7 out of 15) indicated they were somewhat important.

4.2.4 The respondent businesses were next asked about the types of methods they used to engage with the TSB and university staff. By far the most widely used means of communication between the businesses and the TSB and university staff were email and telephone exchanges. Almost all the respondents (14 out of 15) claimed they did that. The evidence suggests the businesses preferred to conduct one-to-one discussions with academic staff, far more than they did with TSB staff. Four-fifths of the respondents (12 out of 15) indicated that they primarily engaged in their non-transactional interactions through meetings with university staff only, i.e. with not TSB staff present. In comparison, fewer than half (6 out of 15) engaged in similar meetings with TSB staff only, i.e. with no university or academic staff present. However, two-thirds of the respondents (10 out of 15) indicated they engaged in non-transactional interactions during meetings with both TSB and university staff present. Unsurprisingly, more than half of the respondents (8 out of 15) indicated that the meeting with university staff only was also their main mechanism for engagement.

4.2.5 On the whole, the respondent businesses found most of the mechanisms for engaging with TSB and university staff quite effective. The focus was on the interactions where both TSB and university were present with businesses. Here almost half described meetings with both TSB and university staff present as generally effective (47%), while a third deemed them very effective (33%). Indeed, more than half considered their one-to-one meetings with TSB staff only to be at least generally effective (40%), or even very effective (13%). It is notable, though, that more than one in ten respondents (13%) took a contrary view, and considered this mode of engagement as not so effective. In terms of interactions with the universities, 40% thought they were very effective and just over half generally effective. Conferences and such events were also rated as generally or very effective by three-fifths of respondents (60%). Unsurprisingly, the large majority of respondents considered their email and telephone exchanges with TSB and

university staff as either generally or very effective (60% and 27%, respectively). See Table 4.32.

Table 4.32 Effectiveness of Mechanisms in Delivering the Benefits

	Percentages of all respondents				
	Very effective	Generally effective	Not so effective	n/a	Number of respondents
Meetings with TSB staff only	13	40	13	33	15
Meetings with university staff only	40	53	7	0	15
Meetings with both TSB and university staff present:	33	47	0	20	15
Conferences / events / workshops:	20	40	0	40	15
Telephone / email exchanges:	27	60	13	0	15

Source: PACEC Survey of businesses 2012

4.2.6 Lastly, in this section, the survey sought to find out more about the level of involvement of the businesses in specific TSB programmes. This is particularly significant, as these programmes are formalised and may be considered to require some degree of communication and other interactions, based on a contractual obligation. The respondents, collectively, were involved in some way in all the TSB programmes. Around two-thirds (9 out of 14) were engaged in the Grant for R&D programme, and half (7 out of 14) in Collaborative R&D. Two-fifths (6 out of 14) had some involvement with TSB's International programmes, while around a third (5 out of 14) were involved in Knowledge Transfer Networks. A small number had, variously, participated in KTPs, Catapults (2 out of 15 in each case), the Small Business Research Initiative and Innovation Platforms (1 out of 15).

4.3 The Benefits to the Businesses of Interaction

4.3.1 One of the important aspects of the non-transactional interactions with the TSB and universities relates to how beneficial they are considered to be for businesses, particularly when considered within the context of meeting their overall research and knowledge exchange objectives. In this regard, the businesses were asked, first, to describe how their contacts with TSB within their wider networks of contacts allowed them to meet those research objectives. On the whole, more respondents rated their contacts with TSB as important rather than not important. Approximately one in three (5 out of 15) described their contacts with TSB staff were very important, and around a quarter (4 out of 15), moderately important. It is notable, though, that around a third were less certain, and described their contacts as only somewhat important.

4.3.2 Turning to universities, many more of the businesses were optimistic than pessimistic about the importance of the interactions with universities for meeting their research and knowledge exchange objectives as a whole. Indeed, just over half of the respondents (8 out of 15) described this relationship as very important or critical, and a third (5 out of 15) as moderately important. But another third of respondents were

less sanguine, and described the contacts with universities as only somewhat important.

4.3.3 The survey next probed the respondents about the main benefits for businesses from their non-transactional interactions with both the TSB and universities. The results are presented in Table 4.33. The respondent businesses identified three benefits in particular as standing out from the interactions. More than four-fifths (87%) believed businesses had been enabled to access new ideas, and to gain new perspectives in different areas of discipline. A slightly lower proportion than this also believed their interactions had encouraged research in TSB to become better targeted to the needs of business (80%) and, similarly, encouraged HEI research to become more relevant for commercialisation. The other notable benefits included helping businesses find appropriate research partners in universities (75%), and helping improve business culture towards engaging with academic institutions (73%).

Table 4.33 Main benefits for businesses from non-transactional interactions with TSB and universities

	Percentages of all respondents					Number of respondents
	No impact	Low impact	Medium impact	High impact	Medium or high impact	
Research in TSB becomes better targeted to the needs of business	13	7	73	7	80	15
Research in HEIs becomes better targeted to the needs of business	7	27	53	13	66	15
Helps businesses find appropriate TSB research / collaborative partners	7	33	33	27	60	15
Helps businesses find appropriate HEI research / collaborative partners:	13	13	25	50	75	40
Ability of businesses to apply for / access HE funding	75	8	17	0	17	12
Helps to improve the culture amongst businesses towards engaging TSB	13	27	60	0	60	15
Helps to improve the culture amongst businesses towards engaging HEIs	0	27	53	20	73	15
Improves ability of businesses to overcome innovation / technology issues	13	20	33	33	66	15
Makes HEI research more relevant for commercialisation and business growth	13	7	60	20	80	15
Improves business performance	27	33	20	20	40	15
Improves business innovation skills and practices	13	20	60	7	67	15
Helps businesses access new ideas / multidiscipline areas	0	13	40	47	87	15

Source: PACEC Survey of businesses 2012

4.3.4 Only few of respondents (7 out of 15) were prepared to express a view on the added value (or additionality) from their interactions with TSB and university staff. Most of

those who did, though, were convinced that the perceived benefits would not have been realised in the absence of their non-transactional interactions.

4.4 The Constraints Faced by Businesses

4.4.1 The discussions with the businesses allowed some constraints to the interactions to be identified. The businesses had different overall aims to the TSB and the universities, in particular, in the sense that their core aims were to generate revenue and achieve reasonable levels of profits to satisfy their shareholders in the medium term, and remunerate staff adequately. They faced constraints on their time because they had very full schedules, in some contexts where there were fewer staff. Business priorities also limited the time they could spend on the non-transactional activities, especially where there were “events” eg the need for sales (and marketing) and where issues arose with suppliers. Sometimes the TSB / university interactions could be seen as general and not related to specific opportunities. The non-transactional activities could be seen as bringing medium rather than shorter term benefits. It could also take some time to set up activities with both TSB and university staff who also faced time and resource pressures.

4.5 Summary of the Interviews

4.5.1 This section draws on the results from the research with businesses. It summarises the key points from the headline findings from survey of businesses, to reflect the overall aims of the project.

Characteristics of businesses

- More than half of the businesses included in the survey were independent businesses with no subsidiaries. One in five were independent businesses with subsidiaries, and the rest were subsidiaries of UK and overseas-owned companies. The businesses were at different stages of maturity, with a mix of mature and long-established firms and young, more recently-established ones.
- The businesses varied in size, in terms of the number of people they employed. With a median of 30 employees, the majority of the businesses could be classified as SMEs. However, there were some very large businesses too, thus pushing the average number of employees to around 7,000.
- The businesses were drawn from a narrow range of sectors. One in three were involved in research and development, and the rest in manufacturing and engineering, business services, and utilities and waste management.
- Given the prevailing difficult business environment, it was not surprising that 11 out of the 15 firms claimed they had only moderate ambitions for growth in the short to medium term. The rest expected to remain the same size.

Purpose of non-transactional interactions

- The businesses were keen to develop their relationships with higher education institutions. Consequently, four-fifths (80%, ie 12 out of 15) sought to use the opportunity offered by their non-transactional interactions with the

TSB to make universities better aware of research being carried out by businesses themselves. Around half (53%) hoped to find out more about the research priorities of universities, and an identical proportion (53%), to find out more about the opportunities for TSB funding.

Methods for non-transactional interactions

- Unsurprisingly, almost all the businesses indicated that email and telephone exchanges were their primary means of engaging with TSB and university staff. However, most of the businesses indicated they had face-to-face meetings with university staff only (ie with no TSB staff present), in preference to such meetings with TSB staff only. Indeed the meetings with university staff only was the main mechanism for business engagement in non-transactional interactions. Despite these differences, the majority of the businesses found most of the mechanisms for engaging with TSB and university staff quite effective.

Benefits of interaction

- On the whole, the businesses regarded their interactions with TSB and university staff as important, albeit with interactions with university staff considered marginally more important. The businesses identified three principal benefits from their non-transactional interactions. A large majority believed that businesses had gained new ideas and perspectives in different disciplines as a result of the interactions. A substantial number also thought that TSB research priorities had become clearer, and thus encouraged research in universities to become more relevant for commercialisation. Last, but by no means least, the businesses had benefited by finding appropriate research partners in universities, which in turn had helped improve business culture towards engaging with universities and academics.

Business constraints faced

- The businesses had full schedules and time constraints at a time when staff resources were lower and they had other priorities, sometimes shaped by events, for example, when sales and revenue was required. Some of the TSB / university interactions were more general and not linked to specific opportunities, especially in the short term. It could also take time to set up TSB / university activities where all partners faced time and strategy issues.

5 Overall Conclusions

- 5.1.1 It is clear from the research that there are important benefits to the businesses and the principal stakeholders from the non-transactional interactions between the TSB and university staff. This is important, as it reflects the aim of TSB to strengthen the interface between universities and businesses to bring about mutual benefits from innovation and in particular to businesses. Even more importantly, the evidence further suggests that the perceived benefits would probably not have happened without the interactions. Central among the impacts is the TSB's brokering role in bringing together innovating businesses and relevant academics. The non-transactional interactions also help to better align the research of universities to the needs of business, and help to make universities more responsive to businesses through better recognition of their needs. Last, but by no means least, the interactions contribute towards improving the culture within the university sector to engaging with industry and furthering exploitation. The interactions helped influence and shape TSB's programmes with universities and hence the benefits to businesses.
- 5.1.2 It is important to point out, though, that many of the impacts outlined and discussed in the report are qualitative in nature. They are, moreover, difficult to capture fully and quantify, and even more difficult to value. It could be argued this makes it difficult to fully demonstrate the case for the interactions, particularly at a time that time constraints are increasing the pressure on TSB staff and their university and business partners to focus more on transactional activity.
- 5.1.3 However, the recent evaluation of the Collaborative Research and Development Programme (CR&D) carried out by PACEC³, where partnerships can arise through non-transactional interaction, corroborates many of the findings from this research. In particular, the evidence from that evaluation showed the beneficial impacts from one of TSB's main programmes aimed at bringing universities and businesses together to improve innovation. The non-transactional interactions between TSB, the university and businesses were demonstrated as helping not only to facilitate university involvement in the programme, but also contributing to the subsequent impacts. Among the main impacts for both universities and businesses were that CR&D strengthened their collaborative activities and attitudes to collaboration, improved innovation, R&D skills and practices, allowed technologies to be exploited, and the feasibility of ideas to be assessed. The majority of project participants also indicated that CR&D had assisted their products and services to reach the market. More than half the business partners in that study also believed their participation had increased their turnover and employment. The impact on the UK economy was estimated at 13,350 net additional direct and indirect full time equivalent jobs, and £2.9bn in gross value added (GVA).
- 5.1.4 The sections that follow draw out the main results of the research in order to reflect the aims of the project and highlight the benefits to businesses. The key points from

³ TSB. *The Evaluation of the Collaborative Research and Development Programme*. September 2011. Carried out by PACEC.

the research with TSB staff, universities and the businesses are summarised and compared, where appropriate, for each of the objectives set out for this project.

5.2 Interactions with universities and businesses

5.2.1 Interactions between TSB and university staff are an important part of the TSB's activities. A portfolio analysis undertaken by the TSB of its funding showed that 66% of the total current grant value involved research based partners (ie universities) or c£550m. The analysis also found that almost three quarters (72%) of the total grant funding involving universities (including CR&D, KTPs and Research Council contributions) was received by just 25 universities. The universities of Warwick, Cambridge and Birmingham received the highest amounts.

5.2.2 The higher educational institutions included in this survey represented the broad spectrum of universities across the UK, including those ranked in the top 25 for TSB investment and those ranked lower. The respondents themselves included both academic and non-academic staff, but all of whom were involved in knowledge transfer projects. More than two-fifths of these were in a senior position at their university.

5.2.3 Most of the 20 firms included in the consultations were independent businesses with no subsidiaries. One in five were independent businesses with subsidiaries, and the rest were subsidiaries of UK and overseas-owned companies. The businesses were at different stages of maturity, with a mix of younger ones and mature and long-established firms. They varied in size, in terms of the number of people they employed. The majority of the businesses could be classified as SMEs. However, there were some very large businesses too, thus pushing the average number of employees for the firms consulted to around 7,000. The businesses interviewed came from a narrow range of industry sectors, primarily with high value added outputs. One in three were involved in research and development, and the rest in manufacturing and engineering, business services, and utilities and waste management. Given the prevailing difficult economic environment, it was not surprising that two thirds claimed they had only moderate ambitions for growth in the short to medium term.

5.3 Non-transactional interactions with universities and businesses

5.3.1 TSB staff were involved in a wide range of non-transactional interactions with the university sectors, i.e. activities that were not directly related to the portfolio funding for universities. Underpinning this activity, typically, TSB staff had widest non-transactional networks with researchers and academics at universities. More than half (55%) of staff had non-transactional interactions with 5-19 researchers or academics over the past year. The TSB staff also engaged with Technology transfer and commercialisation staff at universities at a significant level. Here too, more than half (56%) of the TSB staff had non-transactional interactions with 1-9 technology transfer or commercialisation staff.

- 5.3.2 The university staff, similarly, placed considerable store on their interactions with the TSB, at least to the extent that only few claimed they had not engaged with TSB staff at all during the intervening year. More specifically, some appeared to have almost weekly contact with TSB staff, given their claim to having more than 50 separate non-transactional interactions during the year. On average, the majority of staff interacted with TSB staff at least once every month.
- 5.3.3 There was a marked difference in levels on interaction between TSB and university staff. TSB heads of department had much more interaction with senior university management than other TSB staff. Senior university staff were also most likely to engage with TSB staff, which is to be expected, as they tended to take the lead on programmes and their associated activities which often lead to some form of interaction, in the first place.

5.4 The purpose of non-transactional interactions

- 5.4.1 The role that TSB plays in brokering relationships between the knowledge users and producers as part of the innovation system was an important motivating factor for most TSB staff engaging in interactions with universities. In this regard, more than four-fifths of TSB staff claimed that helping to improve collaboration and links between businesses and universities was a “very important” (54%); or “critical” (31%). Almost as important a motivation was the desire of the TSB staff to help university academics and researchers understand business needs in innovation, technology, or commercialisation. Four out of five TSB respondents (79%) regarded this “very important” or “critical”. A similar proportion also indicated they interacted with universities to help raise their awareness of TSB programmes (79%; 17% critical); while two-thirds considered it very important or even critical to form these interactions so as to help shape future TSB policies and programmes.
- 5.4.2 In terms of their aims of interactions with TSB staff, a large majority of the university staff in the survey hoped that their contacts would provide a better insight into TSB’s research priorities. They considered this to be a critical pre-requisite to their developing proposals for TSB programmes and related funding. On the whole, the university staff appeared to be motivated more by making their research better known to TSB, and to some extent businesses, and less about the commercialisation of their research. Indeed, less than half of them were looking for business partners to collaborate with in knowledge exchange. On the face of it, this appears to contrast very much with the prime motivation of TSB staff to broker relationships between universities and business.
- 5.4.3 The businesses were motivated by quite different priorities for their non-transactional transactions. Reflecting the brokering role of TSB, they were keen to develop their relationships with higher education institutions, some nine out of ten sought a better understanding of university research programmes and, linked to this, their priorities. Consequently, four-fifths (80%, ie 12 out of 15) sought to use the opportunity offered by their non-transactional interactions with the TSB to make universities better aware

of research being carried out by businesses themselves. Around half (53%) hoped to find out more about the research priorities of universities, and an identical proportion (53%), to find out more about the opportunities for TSB funding within this context.

5.5 Methods for non-transactional interactions

5.5.1 Overall, other than telephone and email exchanges, attendance at conferences, events and workshops were the most frequent types of interactions for the TSB staff, underscored by their attending on average about 13 such activities each in the past year. These were followed by individual meetings with university staff only, i.e. with no businesses present. The individual meetings were often the result of either direct contact initiated by university staff, or mutual contact by TSB and universities, for example, during an informal meeting at an event; and were considered by the TSB staff to be the most important methods of initiating the interactions. TSB departmental heads tended to engage more frequently than non-heads in non-transactional interactions, especially through meetings with universities. The most common forms of interaction for non-heads were conferences, events, and workshops. Heads of department were more likely than non-heads to consider direct contact initiated by university staff as very important.

5.5.2 In contrast with the TSB staff, the university staff regarded the direct contact they initiated themselves as the most important means of starting any engagement with TSB staff in the first place. However, a sizeable proportion cited the importance of contact coming the other way, i.e. contact initiated by TSB staff. Senior university staff in particular believed that contacts initiated by them were the most fruitful in producing benefits. The evidence from the survey of university staff also indicated there was frequent contact between university staff and businesses, although this appeared to be conducted more frequently? between non-senior staff and representatives of business. Not surprisingly, non-senior staff were more inclined than senior staff to rate referrals from business more highly as a means of starting engagement with TSB staff. Mutual contact, often informal meetings at events, fell somewhere in-between the two types of direct contact.

5.5.3 There is some distinction between the methods of interaction and the mechanisms through which the university staff engaged with TSB staff. Apart from the more frequent email and telephone exchanges, the mechanism most used by the university staff in non-transactional interactions was the one-to-one meetings with TSB staff only. This was followed by conferences and other events, and meetings where representatives of business were also present. This latter means of interaction was used more by non-senior staff than senior staff. This latter means of interaction was used more by non-senior staff than senior staff. This raises an issue for policy, about the role TSB can play by using the interactions to help universities find business partners for collaboration and knowledge exchange, i.e. a brokerage role.

5.5.4 Unsurprisingly, almost all the businesses indicated that email and telephone exchanges were their primary means of engaging with TSB and university staff. Most

indicated that there were a range of face-to-face meetings with university and TSB staff. Indeed the meetings with university staff was a key mechanism for business engagement in non-transactional interactions. The majority of the businesses found most of the mechanisms for engaging with TSB and university staff quite effective.

5.6 The benefits from non-transactional interactions

5.6.1 The respondents in the surveys identified the benefits to businesses, and themselves, emerging from the non-transactional interactions between the TSB, universities and businesses. But the perceived benefits were considered to vary for the different stakeholders, at least in terms of their emphasis and importance. These might be expected, as likely reflecting the particular motivations for their non-transactional interactions.

Benefits to the TSB

5.6.2 The TSB staff highlighted some key benefits as accruing to their organisation itself. From their perspective, these included creating a more coordinated or strategic approach at TSB (75% of staff with 27% claiming a high impact). They also believed the TSB had now greater understanding of key research trends and the impacts of research (72% of staff with 37% stating a high impact); and as well, greater understanding of the research and commercialisation needs of universities (66% of staff with 23% stating a high impact).

5.6.3 The university staff also thought that the other stakeholders benefited significantly from the non-transactional interactions. The benefits they perceived flowed to the TSB in particular were: improving their understanding of the key trends and impacts of current university research (78%); understanding the research commercialisation needs of higher education institutions (73%); and helping the TSB refine the scope and direction of its programmes (71%). Again, these were remarkably similar to the views of the TSB staff themselves about the benefits of interaction to their organisation.

Benefits to universities

5.6.4 In terms of the benefits to universities, the TSB staff believed the greatest impact on universities was helping them understand the TSB funding available. Two-thirds of the TSB staff (67%) considered the interactions had a high impact, and the rest, that they had a medium impact. The other important impacts they believed accrued to the universities included: helping to improve the culture at universities towards engaging with business (89% high or medium impact); helping universities gain an understanding of nationally important areas of research (85% high or medium impact); and assisting universities to gain a better understanding of the needs of business (80% high or medium impact).

5.6.5 It was clear from the survey that the university staff valued their relationship with TSB very highly. Almost half of them (47%) were in no doubt that their contacts with TSB staff were important for their overall research and knowledge exchange work. They also believed that their respective universities benefited directly from the interactions with TSB staff. They perceived wide-ranging benefits, most notably: improving their understanding of TSB funding available for research (86%); improving their knowledge of key research areas of national importance (84%); improving their ability to apply for TSB funding (83%); and improving their understanding of TSB innovation policies (81%). In this regard, the university staff echoed the views of the TSB staff interviewed about the perceived benefits to universities from non-transactional interactions. Some two thirds of universities also found that the interactions helped them find business partners and understand business needs. The TSB echoed these benefits, reflecting their brokerage role.

Benefits to businesses

5.6.6 The TSB staff perceived the main benefits for businesses of the TSB and university interactions to be helping businesses identify an appropriate university research collaborative partner. This was the most frequently mentioned impact (with medium or high impacts). It was rated as “medium impact” by 58% of TSB staff and “high impact” by 33%. A further important benefit was the alignment of university research to the needs of business. A third of TSB staff (33%) said that there was a “high impact” benefit to business, and 40% said that it was a “medium impact” benefit. Three-quarters of TSB staff (77%) believed that their interactions were having a medium or high impact on helping to make university research more relevant for business commercialisation.

5.6.7 The benefits the university staff perceived to flow to businesses from the non-transactional interactions included: their accessing new ideas and gaining perspectives across a wide range of new subject areas. As well, businesses were thought to benefit from having their needs better targeted by research being undertaken in universities. Even more importantly, the interactions have enabled businesses to find appropriate collaborative partners in universities. The overall beneficial effect was that university research was becoming more relevant for commercialisation and business growth. It is notable that here too, the views of the university staff appeared to corroborate the evidence from the research with TSB staff, about the benefits of non-transactional interactions to business.

5.6.8 On the whole, the businesses regarded the interactions between TSB and university staff as important to them. However, they considered the interactions with university staff to be marginally more important, where they sought to learn more about their research activities and priorities and explore the interface with them. The businesses identified three principal benefits from their non-transactional interactions. A large majority believed that businesses had gained new ideas and perspectives in different disciplines at universities as a result of the interactions. A substantial number also thought that TSB research was more targeted on the needs of businesses, and universities were encouraged to ensure their research was more relevant to

commercialisation. Last, but by no means least, the businesses had benefited by finding appropriate research partners in universities, which in turn had helped improve business culture towards engaging with universities and academics.

5.7 Additionality

5.7.1 The evidence from the survey suggests that around 60% of the TSB staff believe that the benefits outlined above for TSB and the universities would probably or definitely not have been realised by the TSB and the universities in the absence of the non-transactional interactions. This suggests there is a high level of additionality. Just over half believed that the benefits to business probably or definitely would not have been realised without the non-transactional interactions.

5.7.2 On the whole, the university staff believed that the biggest beneficiary of the non-transactional interactions was the TSB itself. This is on the basis of their views about the extent to which the perceived benefits to the different stakeholders would have been realised in the absence of non-transactional interactions, ie the additionality of the benefits. More specifically, half of the university respondents (51%) believed the benefits accruing to the TSB would probably or definitely not been realised on the absence of the interactions. This compares with around two-fifths (42%) who did not think the benefits to universities would have been realised; and exactly one-third (33%) who did not think the same about the benefits to business.

5.7.3 An important cost element of the interactions is the time spent on the interactions. On average, TSB staff spent approximately 7% of their time on non-transactional interactions with universities. However, the survey showed that departmental heads spent approximately twice as long as other staff - 10.5% of their time, compared to 5.6% for other staff.

5.7.4 Making assumptions on the number of hours worked per week and the number of working weeks per year, the analysis suggests that approximately 9,150 hours are spent per year on non-transactional activities with universities.

5.8 Effective Non Transactional Mechanisms

5.8.1 Generally, the mechanisms preferred by TSB staff, the universities and businesses, as being more effective in terms of their aims, were meetings where both universities and businesses were present. Less importance was attached to unilateral meetings with one other type of partner.

5.9 The Key Direct Benefits to Businesses: Combined Views

5.9.1 An important aim of the project is to draw out the benefits to businesses and their innovation activities that arise from the non-transactional interactions. The direct benefits to businesses that were identified by them were:

- They could access new ideas across different disciplines / fields (in TSB and the universities)
- TSB research was targeted more on business needs
- HEI research was geared more towards commercialisation and business growth
- Collaborative research partners were easier to identify in universities reflecting the brokerage role of TSB
- The university culture in terms of working with businesses was improved

5.9.2 In combination these impacts improve the innovation activities of businesses and their ability to commercialise products and services.

5.9.3 The TSB staff also identified these points, and in particular the ability of businesses to find appropriate research and collaboration partners which reflects the TSB brokerage role. The universities also highlighted these impacts. They also thought that businesses were better placed to overcome innovation and technology issues (ie find solutions) and improve their innovation skills and practices.

5.10 Constraints and improvements to effectiveness

5.10.1 These points and suggestions were put forward by the TSB staff:

- The main constraint to non-transactional interactions was a lack of time for TSB staff to fully engage with universities.
- A lack of understanding of the needs of business amongst university staff is the second most frequently mentioned constraint.
- A lack of coordination of interactions amongst TSB staff is also seen as a constraint.
- Uncertainty over the aims of non-transactional activities which could be clarified to improve effectiveness.
- 53% of TSB staff believed that their transactional interactions were more important than the non-transactional interactions and that this was seen as “somewhat” or “very” constraining.
- Meetings with both business and university staff present were seen by the largest proportion of TSB staff (56%) as being very effective for delivering the overall benefits and aims.
- Meetings with just university staff were seen by the majority of TSB staff (64%) as being only generally effective. However, this masks an important difference in views between TSB departmental heads and other staff: 42% of department heads believe meetings with university staff only are very effective compared to 5% of other staff.
- 90% of TSB staff believed that conferences/events/workshops were at least generally effective.

5.10.2 The foregoing reflect the overall view, especially of senior TSB staff, that it is sometimes difficult to view the non-transactional interactions separately as they frequently relate to the programmes, their aims and operation.

- 5.10.3 On the whole, the university staff did not face significant constraints when interaction with TSB staff. On the contrary, they were acutely aware of the overall benefits from the interactions, and about the willingness of TSB staff to engage with universities. They also had considerable support from their own universities to engage with the TSB. Where there were any constraints at all, these were:
- Time availability, as the staff had to fit the interactions into their programmes. This often made it difficult for them to fully engage with TSB staff.
 - The other academic duties: notably teaching and other research.
 - Some cultural difficulties in the sense that the universities could have different aims and ways of working.
 - The only other areas of concern for a minority of the university respondents related to difficulties in identifying and making contact with the appropriate TSB staff. It is worth noting that on the whole, significantly fewer university staff thought they faced any constraints, compared with their TSB counterparts.
- 5.10.4 For businesses, the discussions were more qualitative. The constraints they raised reflected those of the TSB and university staff. They covered:
- The general lack of time because the staff had full schedules, especially where, in some context, there were fewer staff
 - Business priorities and “events” where customer / client, marketing and sales, and business / supplier issues were more important
 - The relevance of transactions where they were general and not necessarily related to specific opportunities such as grant funding
- 5.10.5 The businesses recognised the importance of the non-transactional actions but could see them as bringing medium term benefits rather than shorter term ones. There could also be some constraints in that it took time to arrange activities as both the TSB and university staff faced time and resource pressures.

5.11 Some suggestions on the way forward

- 5.11.1 The analysis above has highlighted the key benefits of the non-transactional engagement with TSB and universities for businesses as well as raising some issues related to the activities and the constraints faced, with implications for improvements that could be made by TSB. This sub-section builds on the views of the TSB and university staff and businesses in an attempt to interpret what they mean for TSB and how some adjustments could be made at both the strategic (policy) and operational levels to improve the outputs of the non-transactional activities and their relationships to the main TSB programmes and transactional activities.
- 5.11.2 There were some small differences between the senior TSB, university staff and businesses related to the suggestions. However, the analysis here has not focussed on one set of views but drawn on the collective opinions of the TSB, university staff and businesses.

The strategic level

5.11.3 TSB should give some priority, and take steps to ensure:

- Greater clarity as to the aims of the non-transactional activities for all involved, especially in a context where the TSB's strategic aims have been re-shaped / are being developed to reflect overall government priorities and growth aims.

These changing government and TSB priorities will also have implications for the universities and businesses and the non-transactional interactions with them.

- Provide a clearer picture to TSB staff, universities and businesses of the business benefits TSB is seeking to achieve through the non-transactional activities. This project has identified what they are considered to be. However, they need to be communicated to TSB staff, businesses, and universities.
- Spell out the interrelationship between the non-transactional activities and the programme or portfolio activities that are particularly important for the universities and businesses:
 - The networking role of non-transactional activities; the market intelligence and technology / opportunity awareness role (for business and university opportunities) and developments, communications, the building of interpersonal relationships, the awareness raising role, the contribution to knowledge exchange, and the brokering activity between universities and businesses.
 - The "reach" of non-transactional activity, i.e. in building links with universities that receive less of the programme funding, or activity but provide expertise in key areas where there may be niche and emerging opportunities for businesses.
 - The interface between the non-transactional and the programme activities. The interrelationships between the two and their respective functions and the priorities between them for staff.
 - How and when TSB should take the initiative in engaging with universities. For example, policy changes, challenges, and new opportunities. These more strategic aims could be communicated to both university and business partners more effectively.

The operational level for TSB staff

- Provide a clear direction of the responsibilities for non-transactional activity amongst the different levels of TSB staff and how they interrelate.
- Agree the outputs to be achieved for staff as targets. These may include the number and type of mechanisms / activities to engage in (say annually), the programme of engagement, and the outputs and outcomes to be achieved for TSB, the universities and businesses – with benefits attributed to the non-transactional activities.
- Agree the appropriate time inputs and resources for TSB staff appropriate to the outputs envisaged.
- Agree the most appropriate mechanisms for non-transactional activities and for different levels of staff, e.g. meetings with the universities, university / business meetings, events and conferences etc.
- Strengthen the internal CRM arrangements, mapping and database showing the university non-transactional activities and the referral routes across TSB and universities.

- Examine the requirement for staff development, briefings, best practice dissemination and training to improve interactions.
- Develop a monitoring system to take stock of activities and progress towards the outputs / outcomes and ultimate aims.
- Agree an overall budget for the activities as part of the annual planning process.
- Ensure that, reflecting the preferences of TSB staff, universities and businesses, non-transactional meetings are given priority where they involve the TSB, universities and businesses.

5.11.4 The suggestions are given equal priority. A working group may be appropriate to consider the suggestions further. TSB is considering further research to assess the views of the universities and businesses which can feed into this process.