



**MIRIAD**

Managing and Infusing Research Investment And Development

## **Thrace Turkey Innovation Strategies**



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#### **4.1. Introduction**

This document presents the strategic recommendations as a response to the key findings in Thrace Region of Turkey including Edirne, Istanbul, Kırklareli and Tekirdağ. The main goal of this report is to summarise the current status of the region in terms of research and development and innovation and draw attention of the policy makers to the strategies integrating the regional demand and supply with the national policies. The choice of these provinces aimed not only to integrate the regional resources but also to enable the knowledge exchange with the border neighbours who are also project partners.

In Turkey there R&D and innovation strategies have been on the national basis. MIRIAD project has created one of the initial samples on developing regional policies, hence, it was critical to determine the status, to define the regional demands and barriers in knowledge creation and transfer in the region.

Fulfilling the objectives of MIRIAD surveys are run for the knowledge demand and knowledge creation and transfer so that strategies can be driven to respond to the regional needs. Surveys have shown that investment in R&D or innovation are not satisfactory enough not because of the shortage of finance.

The culture of innovation has not been initiated in Thrace Turkey therefore the opportunities raised by KOSGEB or TUBITAK are not well used. Surveys show that Chambers of Commerce and Industry in the region are well trusted and are to be given more important roles in developing innovation. Although national strategies are developed in order to support the research, the collaboration between the private industries and the research organisations and/or Universities could not be established. The lack of venture capital in the region avoids the development of service industries.

## 4.2. National Competitiveness in Innovation

Turkey was evaluated as the trailing country in the European Innovation Scorecard in 2005 as indicated in the previous reports. European Innovation Scorecard 2006 shows that Turkey is not even included in the trailing cluster and behind Bulgaria and Romania as seen in Figures 4.1 and 4.2.

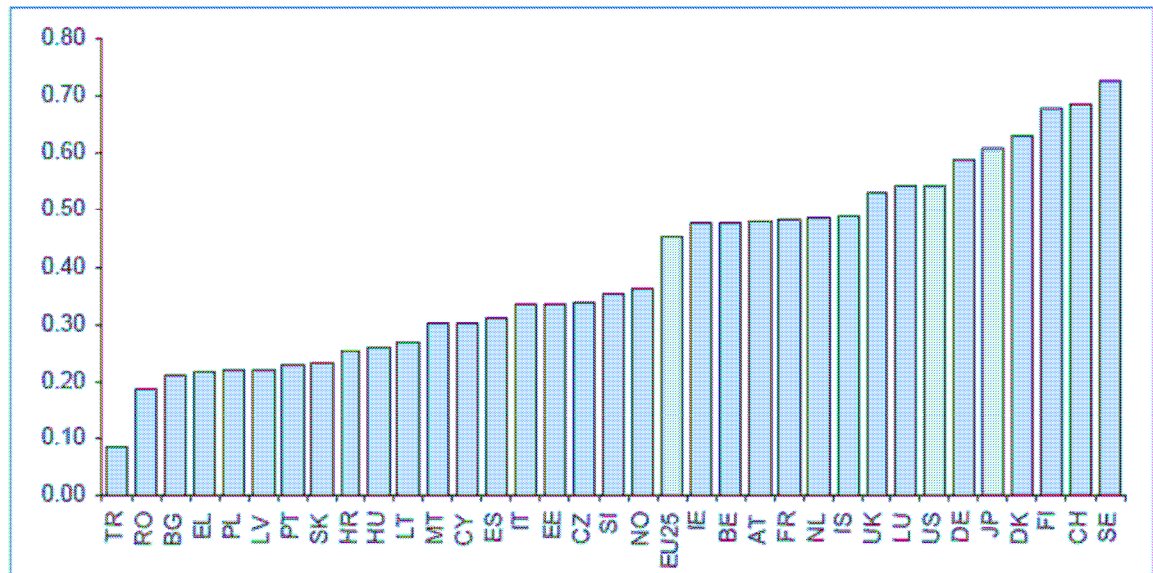


Figure 4. 1 European rank for R&D expenditures  
(Source: European Innovation Scorecard 2006)

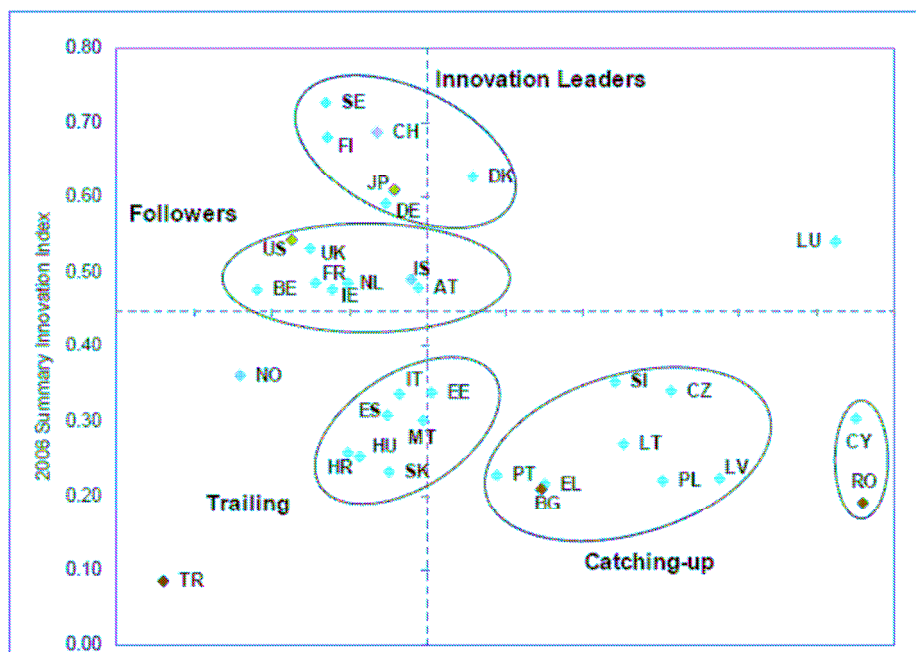
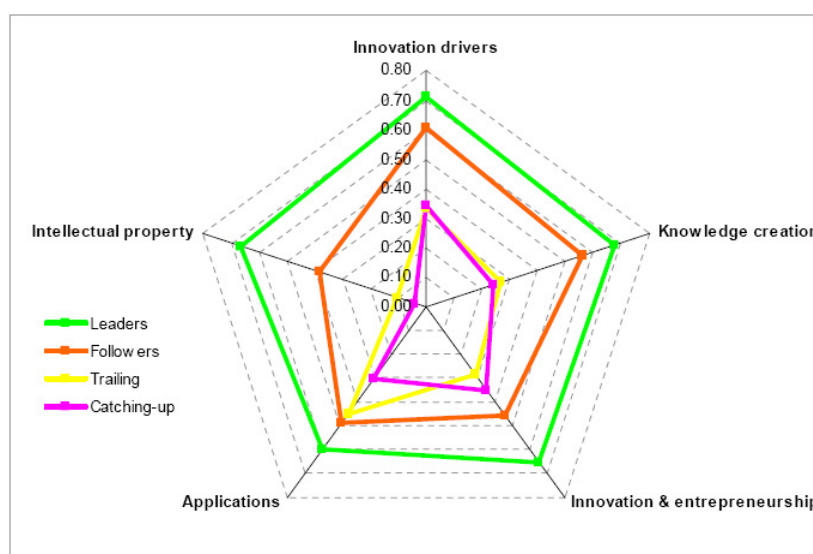


Figure 4. 2 European Summary Innovation Index  
(Source: European Innovation Scorecard 2006)

The European report states that data is missing for the variables constituting the results. The GNP has grown up to more than € 4,000, while the rate of expenditure in R&D has only been increased to 0.08.

Figure 4.3 represents the level of innovation components in different clusters. Turkey does not fit into trailers mainly because of the following reasons:

- Business has little contribution in creating knowledge (28%) mainly because of the high volume of small SMEs with 10-158 employees (Turkish State Planning Organisation, 2007).
- Knowledge creation by Turkish Universities are increasing rapidly getting closer to the followers, however the created knowledge is not used in innovation and entrepreneurship due to the low level of education and lack of innovation culture in the SMEs (Centre for Entrepreneurship, SMEs and Local Development, 2007).
- Unemployment rate of University graduates is reported as the highest in Europe by 12.5% (OECD Educational Attainment Database, 2007). This avoids increase in applications and innovation drivers.
- The alignment of Turkey's legislation with the EC acquis in the field of intellectual property is well advanced (Europa Summaries of Legislation, 2007), yet, greater convergence is required as regards to copyrights, industrial property rights, copyright, neighbouring rights and enforcement.



**Figure 4. 3 Innovation Components**  
(Source: European Innovation Scorecard 2006)

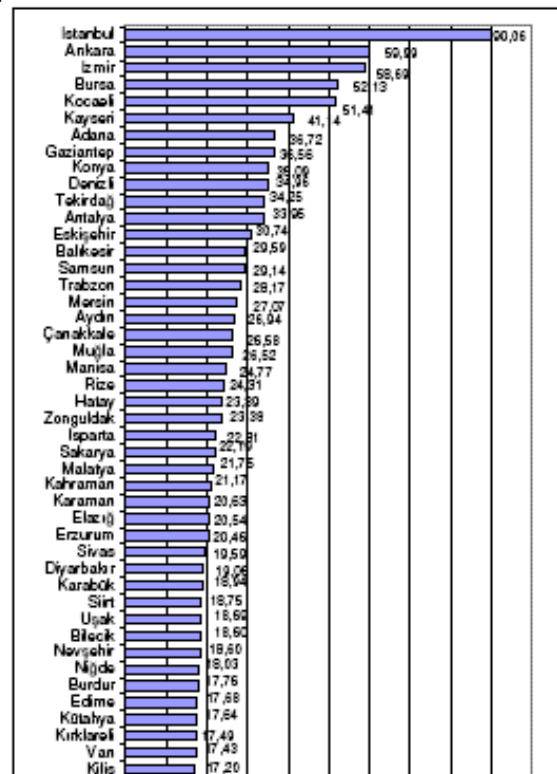
National Innovation Initiative (NII), a collaboration of private sector companies, universities and business organisations has disseminated a national innovation framework composed of work groups to define policies in trends, finance, human capital, infrastructure and public sector innovation (NII Framework report, May 2007). In this report, NII proposes an industrial sector and regional study to develop an infrastructure for innovation based development. Restructuring the learning process and university governance system and disseminating the innovation culture and educating the young generation for the new skills also took place in the framework. Collaborative projects are suggested and financing innovation based projects are defined. This report also encourages the venture capital by highlighting

the value added by innovation based development. Recommendations also include support of new technologies like nano-technology and bio-genetics.

### 4.3. Competitiveness in Thrace-Turkey

A recent study on the competitiveness index of major provinces in Turkey shows a big variation in the region. National Competitiveness Research Council (URAK) takes into consideration human capital, life standards, innovation drivers, commercial potential and accessibility to create the normalised index. Thrace-Turkey region is composed of four provinces Istanbul, Tekirdağ, Edirne, Kırklareli as shown in Figure 4.4. Istanbul is the leader of competitiveness in Turkey as well as being the industrial leader. Tekirdag follows with a 55% difference, since the companies moving out of Istanbul are rebased in Çorlu and Çerkezköy. On the contrary, Edirne and Kırklareli which are still based on agricultural products are stated among the laggards, right above the poorest eastern provinces although they are border to Europe and have high commercial potential.

In this index, human capital considers the rate of university educated and technically educated employees in the city to the national numbers as well as university entry exam success. Life standards include hospital availability, number of cars, volume of bank account per person besides, crime rates, football league success, shopping centres and five star hotels. As innovation drivers, number of patents, trade mark licences, referenced service or industrial models and number of new product design are covered. Accessibility is defined as all the telecommunication and transportation availabilities in the province. Commercial potential covers the largest number of factors as to bank credit possibilities, exportation rates, international investments, new companies or bankruptcy, state subventions, KOSGEB office and inter-regional trading capacity.



**Figure 4.4. Extract of Competitiveness index in Turkish Provinces**  
**Source: National Competitiveness Research Council (URAK), 2007**

Table 4.1 presents a SWOT summary of Thrace-Turkey R&D investment. It highlights the potential of research capabilities in the regional universities which are only state funded through TUBITAK. Finance capital installed in the banks is a considerable potential that could help to develop the service sector which could be activated through the intermediary organisations. Lack of innovation culture and intellectual property development is the biggest weakness. Potential problem of relying on the public decision makers avoid clarifying the regional needs. Major decision makers in the region are KOSGEB and TUBITAK-Marmara, which are both focused on national policies. Business organisations are just recognising their strength in regional policies.

**Table 4.1: R&D Investment SWOT Summary**

|               |   |
|---------------|---|
| Strengths     | Number and research skills of both public and foundation universities.  |
| Weaknesses    | Lack of R&D and innovation culture in the region which is largely dominated by SMEs.                              |
| Opportunities | Angel investors are encouraged by the new Government policies which can make use of the existing finance capital. |
| Threats       | Academic policies that does not support the response to the local needs.  |

R&D investment policies impacting Thrace Turkey mainly depends on the national policies. National Science and Technology Council stated in the Vision 2004-2013 aims to increase the knowledge based investment (measured by the ratio of R&D investment to national gross domestic product) from 0.06 % to 2 % in 2013. The second national policy to follow is suggested in NII Innovation Framework 2007-2013, where establishment of venture capital funds by private sector is suggested. It is stated that efficient use of resources for financial support amounting to €100 million could develop the knowledge dissemination in 2007-2013 by the dynamics of joint business composition.

*R&D: A National Policy Priority*

Key national targets include increased business investment in R&D, and integratede business engagement in drawing on Turkish innovation base:

- Increase business investment in R&D as a share of GDP from at least 1/3<sup>rd</sup> of the current percentage.
- Take place among the countries clustered as catching up by encouraging the risk investments.

*R&D: A Regional Policy Priority*

The key aim of Thrace-Turkey with respect to R&D, innovation and knowledge transfer is mainly to triple the rate of investment by encouraging the venture capital. In order to realise this aim, the innovation infrastructure and culture among the SMEs have to be developed.

Unemployment rate and the lack of skilled employees were to be considered while developing innovation based policies in Thrace-Turkey.

| <b>Recommendation 1</b>  | <b>Rationale</b>  |
|--|---|
| Follow NII recommendations on developing the innovation based culture by encouraging the business-HE collaboration through clusters. | Low competence value in European Scorecards is due to the lack of data and culture. The existing finance is not used in entrepreneurship and the service sector since universities and the business have different focus of research. |
| <b>Recommendation 2</b>  | <b>Rationale</b>  |
| Encourage distribution of national financial support based on competitiveness index.   | National R&D funds are distributed by TUBITAK according to the projects suggested.  |
| <b>Recommendation 3</b>  | <b>Rationale</b>  |
| Focus on female employees in the region to develop innovation based skills.  | High unemployment rates of university graduate women in the region.   |

#### 4.4. R&D Investment Scenarios

This section illustrates three scenarios for Thrace-Turkey based on future investment in R&D by the region's business community. The three scenarios are:

- Scenario 1 – Continuing the Current Trend.
- Scenario 2 – Moderate Increase in R&D expenditure.
- Scenario 3 – Substantial Increase in R&D Expenditure.

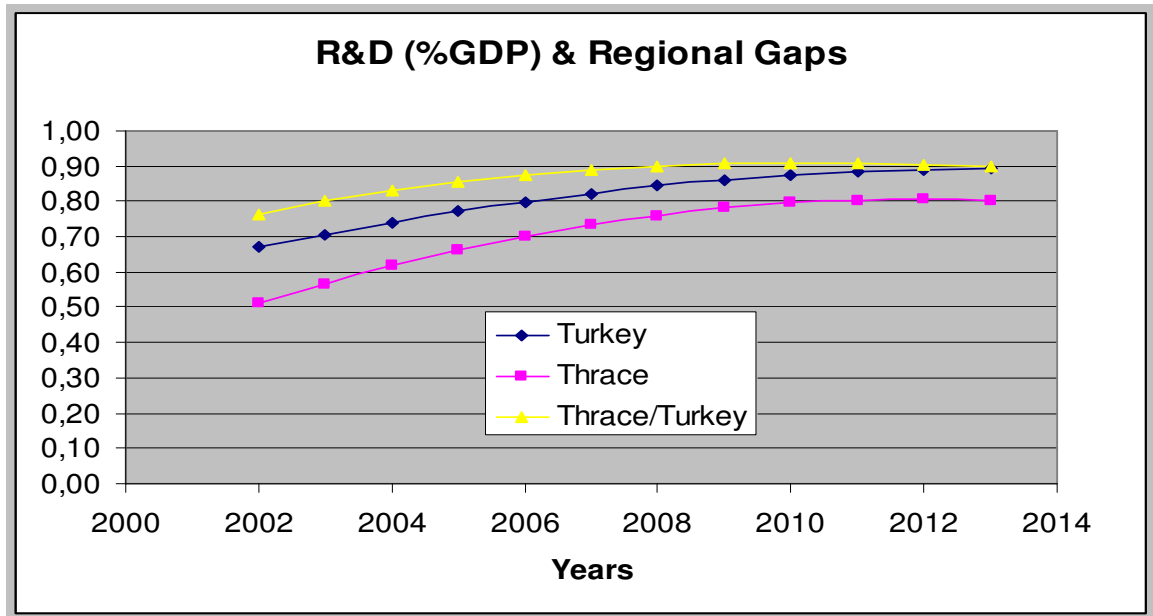
##### *Scenario 1 – Continuing the Current Trend*

This scenario is based on having the same pace as 2004-2007 in Turkey to continue without any improvements. This will not allow the R&D expenditure to be more than 1% in 2013 and the business investment is reducing. Figures 4.5 is demonstrating this case. This is a scenario taken by the labor unions which see the possibility of radical politics and the impact of the instability in the Middle East.

In this scenario the business sector share is expected to reduce to 26 % in Thrace-Turkey, whereas government share to increase to 5 % and the HEI share to increase to 69%. Explicit focus on the HEI share is caused by the increase in number of young foundation universities which are expected to develop research centres in the future.

The wider implications of this scenario are:

- The Universities will not be able to make a reform to open to the real economy.
- The business sector will loose the competitive advantages.
- The unemployment of the university graduates will increase.
- The GDP growth will not keep its current pace.
- The Government will face difficulty to pay the foreign debts.
- This scenario will cause Turkey to stay far behind Europe and become a third world country.



**Figure 4.5 Rate of Investment in R&D 2000-2014 Based on Current Trends**

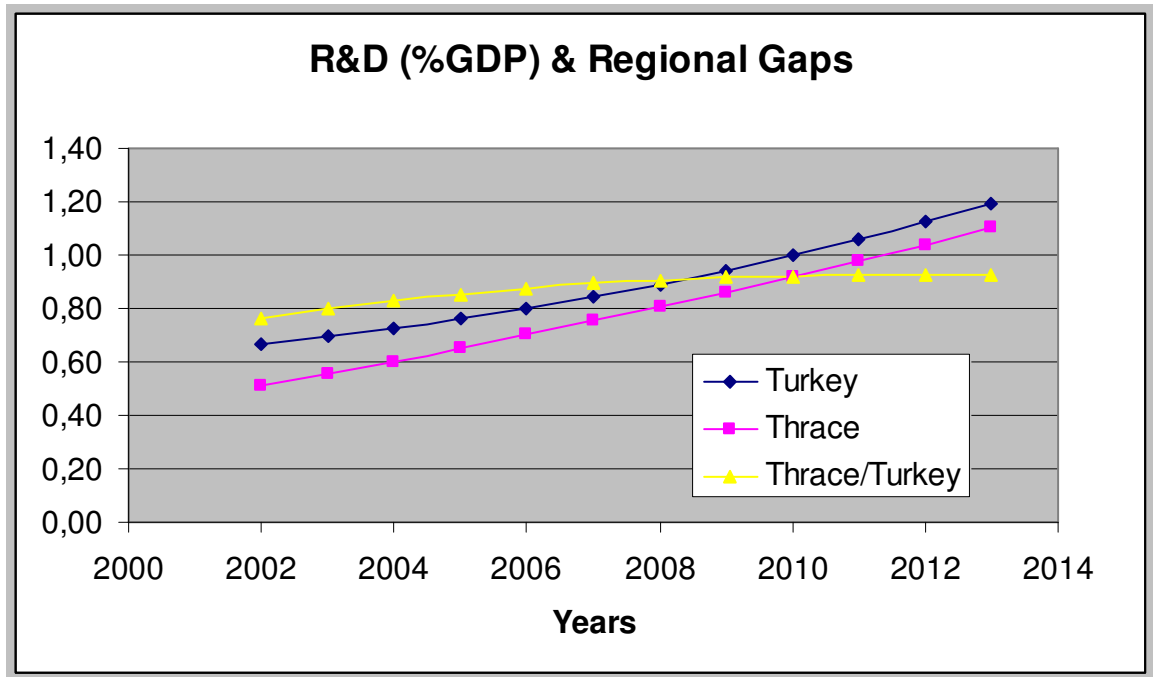
*Scenario 2 – Moderate Increase in R&D expenditure*

This scenario is based on a moderate increase in rate of growth of R&D expenditure from 0.67% per annum to 1.28%. A constant growth of 6 % in GDP (current growth) is considered and therefore Project Evaluation and Review Technique (PERT) is used.

As seen in Figure 4.6. the R&D expenditure share in GDP of the region can only go up to 1.20 % in 2013, where the business sector has a share increase up to 44.83 % government has a very slight increase up to 3.84 % but the HEI share is reduced down to 55.49 %. This scenario leads for the development of the regional competence, although it stays behind the European countries aiming an R&D expenditure of 3 %.

The wider implications for this scenario are:

- Local economic needs are focused.
- Innovation culture starts to disseminate among the regional SMEs.
- Some of the latent finance can be converted to support the regional development.
- The regional economy is not much developed but the region can take place in the cluster of catching up countries in EU scorecards.



**Figure 4.6 Rate of Expenditure on R&D 2000-2014 Based on an Increase of 6 % per Year**

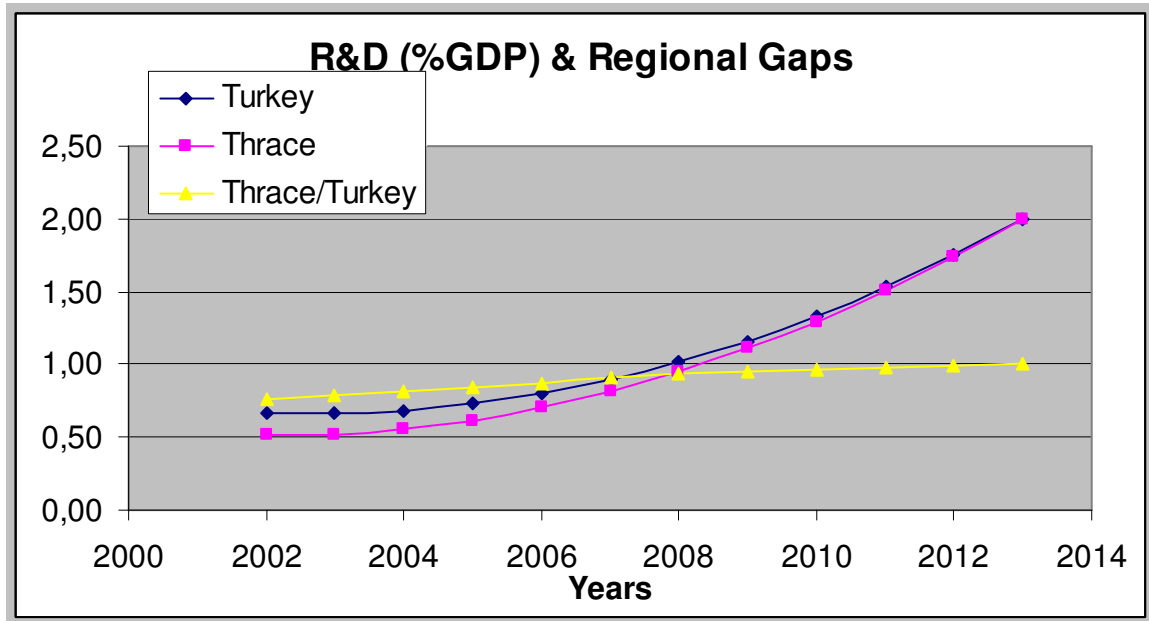
*Scenario 3 – Substantial Increase in R&D Expenditure*

This scenario is based targeting to have RTD expenditure of Turkey as 2% of GDP in 2013 as stated in the Ninth Development Plan and Vision 2023. The region has the competence to set the same goal. The national figures for 2002 are taken from European Scorecards and the figures for 2006 were taken from TUBITAK.

The share of Corporate Sector in RTD expenditure was 28 % in 2002 and the target is to increase the share up to 60 %. The Government sector had a share of 28 % in 2002 and the target is stated to be down to 5%, where the higher education share is targeted to reduce from 64 % in 2002 to 35 % in 2013.

This scenario briefly means that the knowledge driven economy will be effective in Thrace-Turkey. The wider implications of this scenario are:

- The increased level of R&D will create a higher number of skilled jobs which will act as an incentive for skilled workers to stay in the region as well as attracting others from the outside.
- University-business collaboration will result in an economical development in the region which will attract the foreign investment.
- Thrace-Turkey will be more competitive region in the Balkan peninsula to lead the EU members in the region.



**Figure 4.7 Rate of investment in R&D 2000-2014 Based on a substantial increase to achieve the goal of 2% in 2013.**

In Summary:

- Scenario 1 – if the region continues its current trends then the regional economy will continue to diverge from the EU countries.
- Scenario 2 – small improvements will merely maintain the region’s current lagging position.
- Scenario 3 – large improvements in R&D expenditure will trigger a considerable economic development in the region.

|  |  |
|--|--|
| <b>Recommendation 4</b>  | <b>Rationale</b>   |
| Ignite the chamber of commerce and industry to take an important role in the innovation based development in the region. | If a substantial increase in R&D investment, the region will be far behind Europe.         |
| <b>Recommendation 5</b>  | <b>Rationale</b>   |
| Encourage entrepreneurship in the service sector in the region.  | The share of business investment in knowledge based economy has to increase substantially. |

#### 4.5. The Knowledge Economy

Within the region the key stakeholders responsible for knowledge supply and creation are the universities. Istanbul Technical University, Bosphorus University, Sabanci University are considered to be the science and technology leaders of the country. On the other hand, five medical schools run research on life and health sciences. There is no collaboration among the regional Universities.

The oldest and the most developed knowledge based companies of the country are based in Istanbul, which is one of the reasons that it is the leader in competitiveness index shown in Figure 4.4. Most of them are the branches of international corporations. However, there exists almost no service sector in the rest of the region which causes the university graduates in Edirne and Kırklareli to move to Istanbul and Tekirdağ.

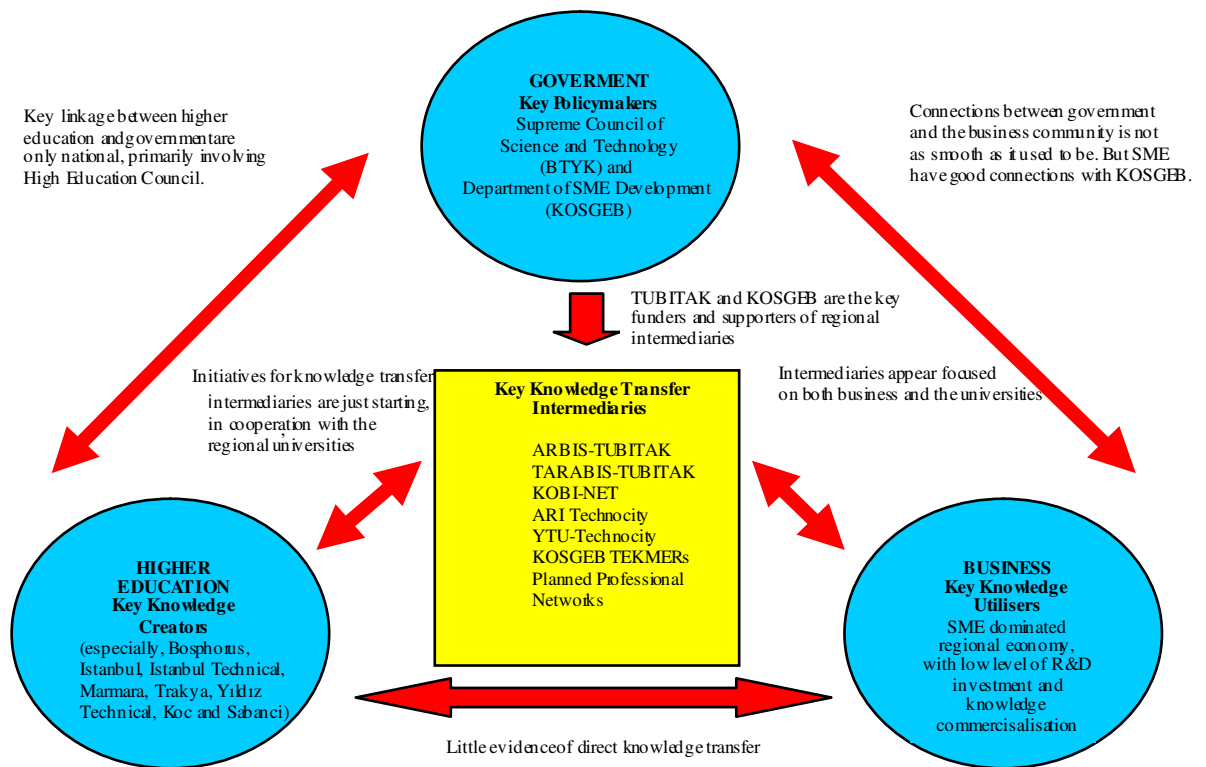
In 2006-2007 the spin-offs have been started in the techno parks by the leadership of large industrial companies like Vestel Electronics and Arçelik.

| <b>Recommendation 6</b>   | <b>Rationale</b>   |
|---|--|
| Cluster and rank the knowledge based organisations in the region. | The number of knowledge based SMEs are increased in the region recently. |

Policies relating to knowledge demand and absorption are being redesigned as explicit policies at the private sector. In the last year, more industrial companies have started working actively with the universities to share the benefits of graduate studies. A new law is expected to be effective in 2008 for the support of innovation based collaborations of industrial companies. Stakeholders of Thrace-Turkey in knowledge transfer and flow are summarised in Table 4.2.

**Table 4.2: Role of Key Knowledge Transfer and Flow Stakeholders**

| <b>Stakeholder</b>            | <b>Role</b>  |
|-------------------------------|--|
| Higher Education Institutions | Research institutes on renewable energy, bio-genetics, aerospace, social sciences, life sciences, medical and pharmaceutical sciences are established in the region with rich laboratories.  |
| TUBITAK-Marmara               | National policy maker and project based financial support for the universities and the industrial organisations. Highly developed techno-park is also in the premises.   |
| KOSGEB                        | Research on SME business besides supporting the HEI and SME with laboratories and Internet technologies.   |
| TUSIAD                        | Research in collaboration with the large industrial companies and big foundation universities. NII is a big project supported by them.   |
| ISO                           | Brings together the SMEs and the Universities.   |
| ARI Techno-Parks              | These parks focus on the incubation of innovative, high-growth, knowledge-based start-ups. They aim to provide an environment in which companies, regardless of size, can develop operational links with universities, higher education and research institutes. |



**Figure 4.7: Triple Helix Representation of Thrace-Turkey's Knowledge Flow Model**

| Recommendation 7   | Rationale  |
|--|--|
| Regional branches of state organisations are to be established in order to disseminate collaborative innovation culture. | Access to public organisations of science and technology is not easy because of bureaucracy. |

A summary of the key issues on the development of the knowledge economy in Thrace-Turkey raised during the consultation process is shown below:

- The Regional Innovation Culture – SMEs in the region are not aware of the existing national innovation policies defined by BTYK and or NII. They should be informed and trained about them in order to develop the regional policies.
- University Improvement - Universities want to improve relations with business organisations in order to develop regional scientific projects that will

be implemented. There is no institutional approach to commercialising knowledge created.

- Finance Capital - There is not enough entrepreneurship in the region to capitalise on R&D, although there is enough financial capital.
- University Academic Evaluation – There is a request for additional credits on local projects.
- New Incentives – Government has approved new incentives for the innovation based collaboration, which will encourage the entrepreneurship in the region.

| <b>Recommendation 8</b>   | <b>Rationale</b>   |
|---|--|
| Encourage private sector-university collaboration through success stories which are recently created. | There is a communication gap between the knowledge creators and the knowledge absorbers. |

#### 4.6. SME Competitiveness, Innovation, and Knowledge Networks

Innovation culture and knowledge networks in Thrace-Turkey are further investigated through a series of surveys run both on SMEs and research organisations in Thrace-Turkey. Initially, SMEs were asked to rate a range of factors in relation to their perceived importance to competitiveness and the effectiveness of use of a particular factor in relation to its importance. Table 4.3 presents a summary of those factors that SME managers consider to either lack or not lack effectiveness in the firm. The confusion of concepts at the level of management is clear.

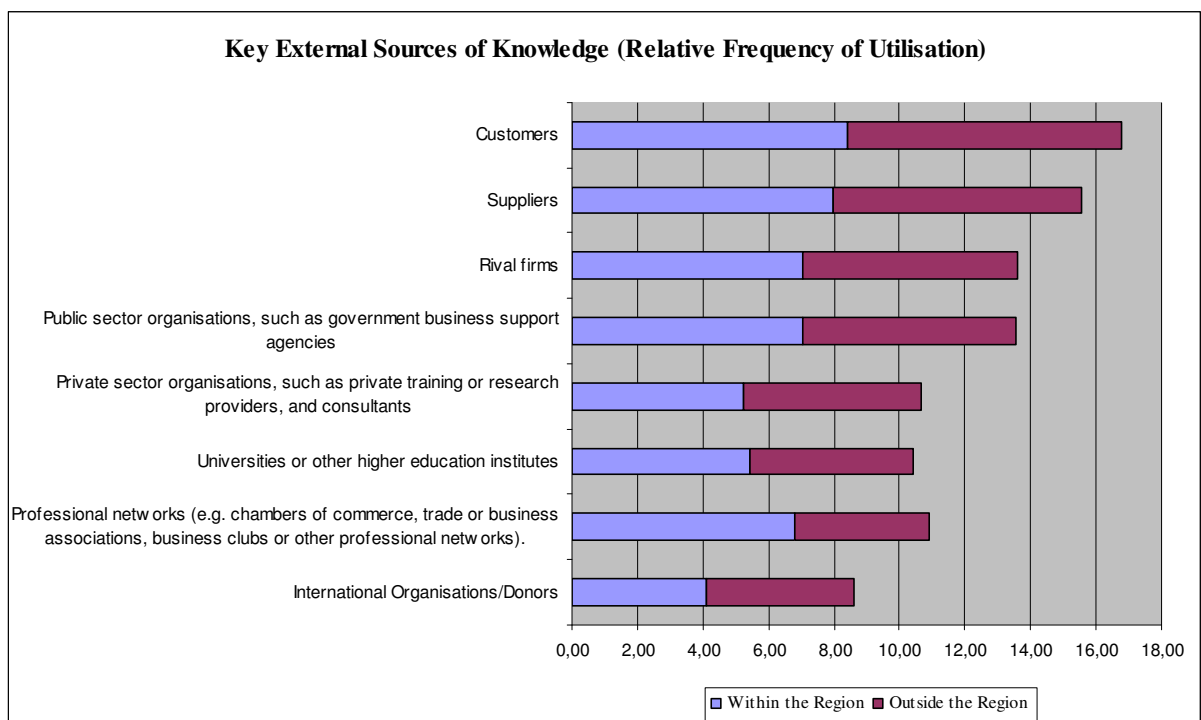
**Table 4.3: The Perceived Determinants of Competitiveness for SMEs in Thrace-Turkey**

|                                      | <b>Lack Effectiveness</b> - in relation to perceived importance to competitiveness                            | <b>Do Not Lack Effectiveness</b> - in relation to perceived importance to competitiveness              |
|--------------------------------------|---|--|
| <b>Human Capital</b>                 | Employee loyalty, employee skills, employee commitment  | Management loyalty, management qualifications, management commitment                                   |
| <b>Intellectual Assets</b>           | Patents filed, website, IT facilities   | Trademarks registered, trade secrets, management experience  |
| <b>Physical Capital</b>              | Retail premises, proximity to suppliers, leased plant   | Rail links , Road links, physical location   |
| <b>Network Capital</b>               | Licence agreements with other firms, Distribution arrangements for their company's products and services      | Reputation of your company , Brand image of their products/services, Relationships with your customers |
| <b>Knowledge Creating Capability</b> | R&D teams/workers, Specific teams created to undertake R&D as required  | Management (but not too satisfied)   |
| <b>Innovation Culture</b>            | Development of new materials, Adoption of new inputs and materials, Development of new processes and services | Core values of firm  |

| <b>Recommendation 9</b>   | <b>Rationale</b>   |
|---|--|
| Regionally-focused training on innovation management and innovation based skills are to be organised by the regional chambers of commerce and industry. | Importance of innovation is not yet understood. There is an important gap in management commitment for skilled employees and IT. Regional chambers of commerce and industry are more respectful than KOSGEB which is currently givin management support. |

It was found that the most frequently utilised sources of knowledge for the SMEs in the region are their customers and suppliers. As Figure 4.8 highlights, both of these are equally utilised with sources outside the region and inside the region. Professional networks and rivals are more frequently used inside the region meaning that the regional competition keeps its high importance. This is also clarified by low utilisation of international networks.

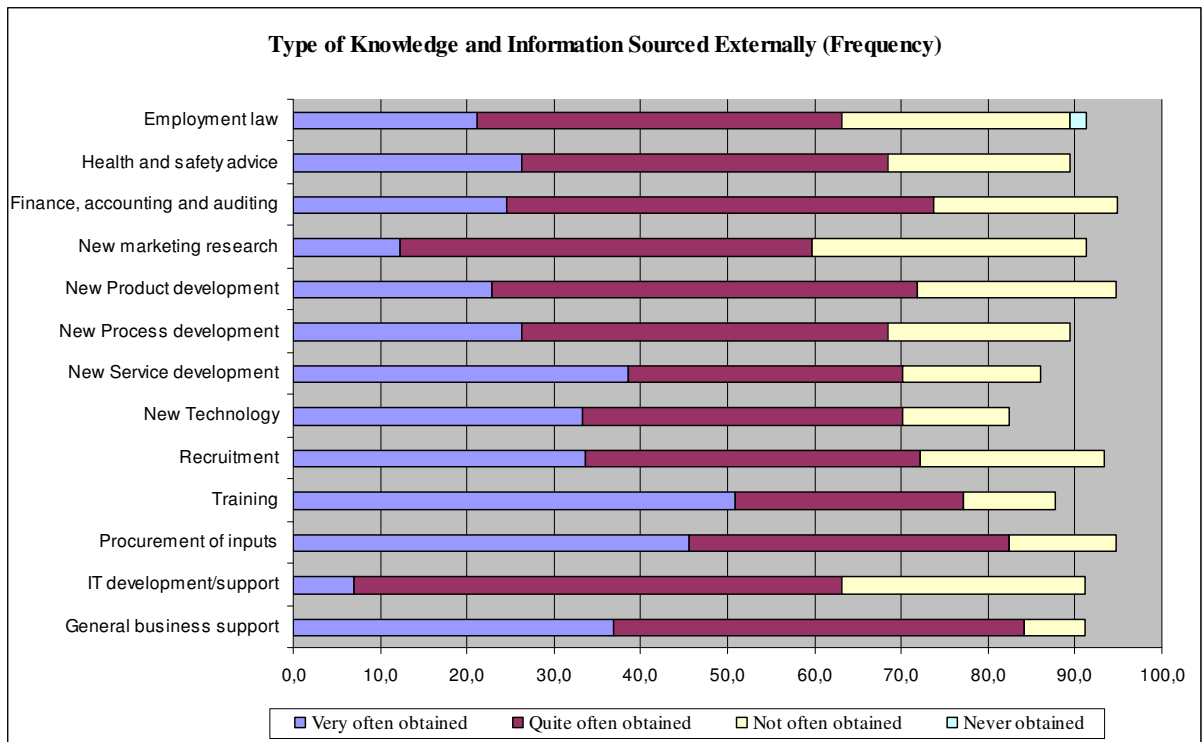
Relative importance of professional networks (mainly chambers of commerce and industry) are demonstrated by the level of knowledge utilised as it is higher than knowledge transfer from both universities and private sector organisations. In general, customers and suppliers both inside and outside the region are the most frequently utilised sources of knowledge.



**Figure 4.8: Key External Sources of Knowledge for SMEs**

Figure 4.9 illustrates how often different forms of knowledge are sourced by the SMEs. As might be expected, the frequently sourced types of knowledge are those which are tightly bound to the overall day-to-day operation and strategic management of SMEs. It was a surprise to see IT development and support scoring as low, which is based on the reason that they are currently using very low technology and find it too expensive to invest more. Low level of sourcing new market information although it is accepted important shows the difficulty of accessing the knowledge banks inside or outside the region. Amongst the creative knowledge, new service development takes the highest level of sourcing which can be used an opportunity for further investment in service sector.

Law and health based information take place amongst the low level of sourcing, mainly due to professional networks (KOSGEB and chambers) are found satisfactory.



**Figure 4.9: Type of Knowledge and Information Sourced Externally by SMEs**

The sample of SMEs interviewed are chosen among the knowledge based companies, but this analysis shows the frequency of sourcing knowledge for innovation is significantly correlated with the innovation culture in the company. There was one single company in automation sector which created five new products during the last three years. The rest have not been focused on innovating processes or products.

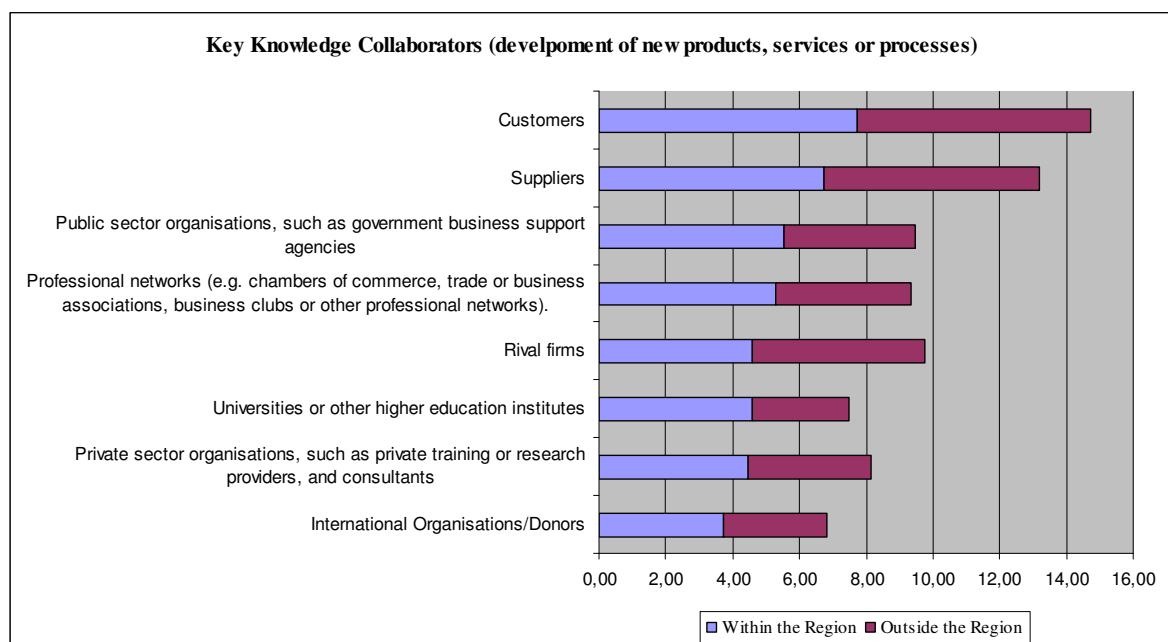
A summary of the other key relationships found include:

- There is a strong positive association between levels of innovation and the sourcing of knowledge for innovation from customers, suppliers, and from business and professional networks.
- Turnover growth is positively associated with the frequency sourcing of knowledge for strategy and operation from the private sector organisations. This indicates that these organisations have little access to the funds.
- There is a positive association between levels of innovation and the frequency of sourcing knowledge for innovation from sources within the region, mainly from the professional networks where SMEs have more power.
- Turnover growth is negatively associated with the frequent sourcing of knowledge for innovation for public sector organisations inside or outside the region.
- SMEs facing competitive pressures tend to receive more strategic management and marketing knowledge from KOSGEB and professional networks and keep away from the universities.

- There is a positive association between the level of management skills and sourcing of knowledge. There is also a positive association between the employee skills and the importance given to knowledge acquisition.
- There is a positive association between the institutionalisation and the innovation. The more quality processes are understood, the more importance is given for competitive information.

| Recommendation 10  | Rationale   |
|--|---|
| Regional incentives for IT investment for collaboration with the customers, suppliers and professional networks will allow development of regional data banks. | Ignorance of IT based knowledge sourcing is mainly based on financial insecurity. |

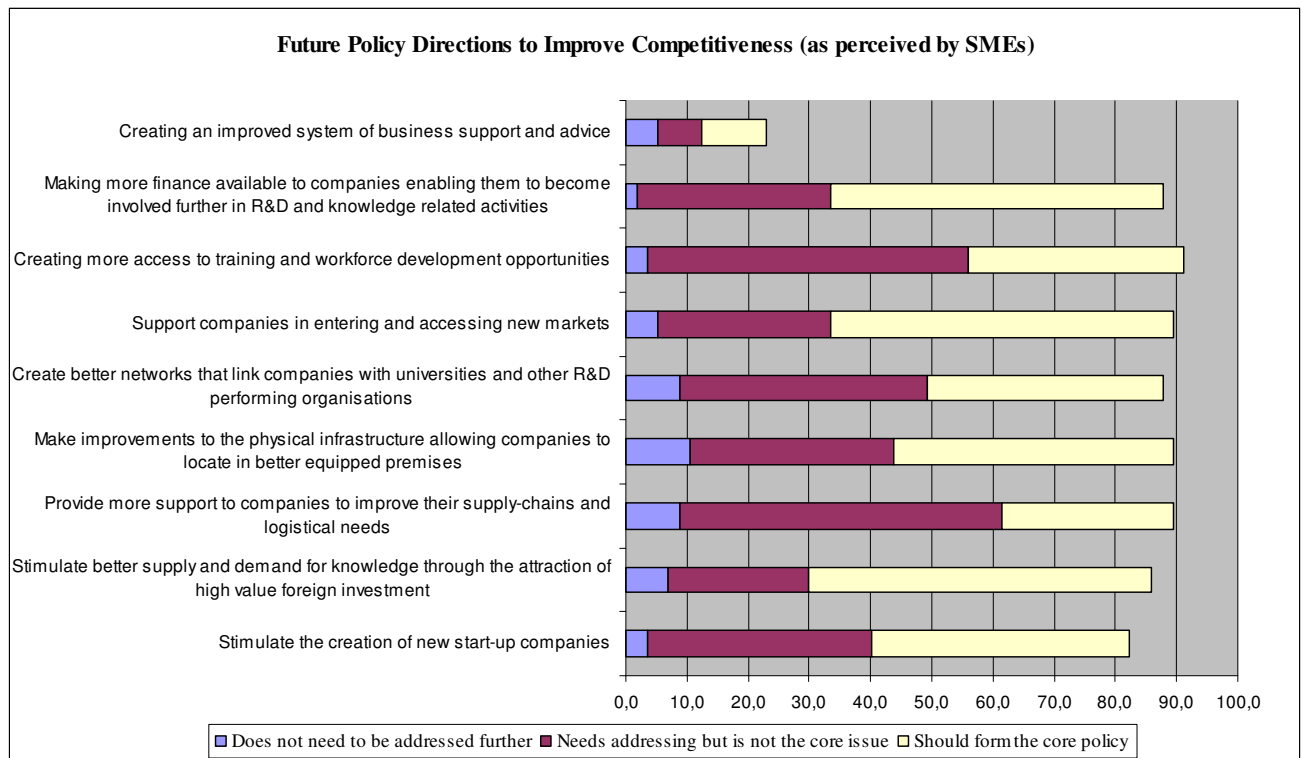
Figure 4.10 highlights the collaboration of SME's with the alliance networks inside or outside of the region. It is observed that the most important knowledge based alliance is with the customers and suppliers equally inside or outside the region. This implies that collaborative innovation is mainly rooted within the supply-chains of these SMEs. Public sector organisations take the third row in collaboration granted to KOSGEB performance. The low level of collaboration with the universities is once more emphasised in this analysis, proving the statement by managers that business has communication problems with the scientists.



**Figure 4.10: Key Knowledge Collaborators for SMEs**

More innovative SMEs are inclined to work closer with universities if they have an intermediary security by the chambers.

According to those SMEs surveyed in the region future regional policy targeted at improving the competitiveness there is an absolute need for focusing on the three keys areas: (1) support in entering and accessing new markets; (2) and improved access to risk capital enabling their further engagement in R&D and other knowledge-based activities; (3) improve the physical infrastructure. This indicates that most of the SMEs have not yet completed their basic needs to absorb the importance of innovative competition.

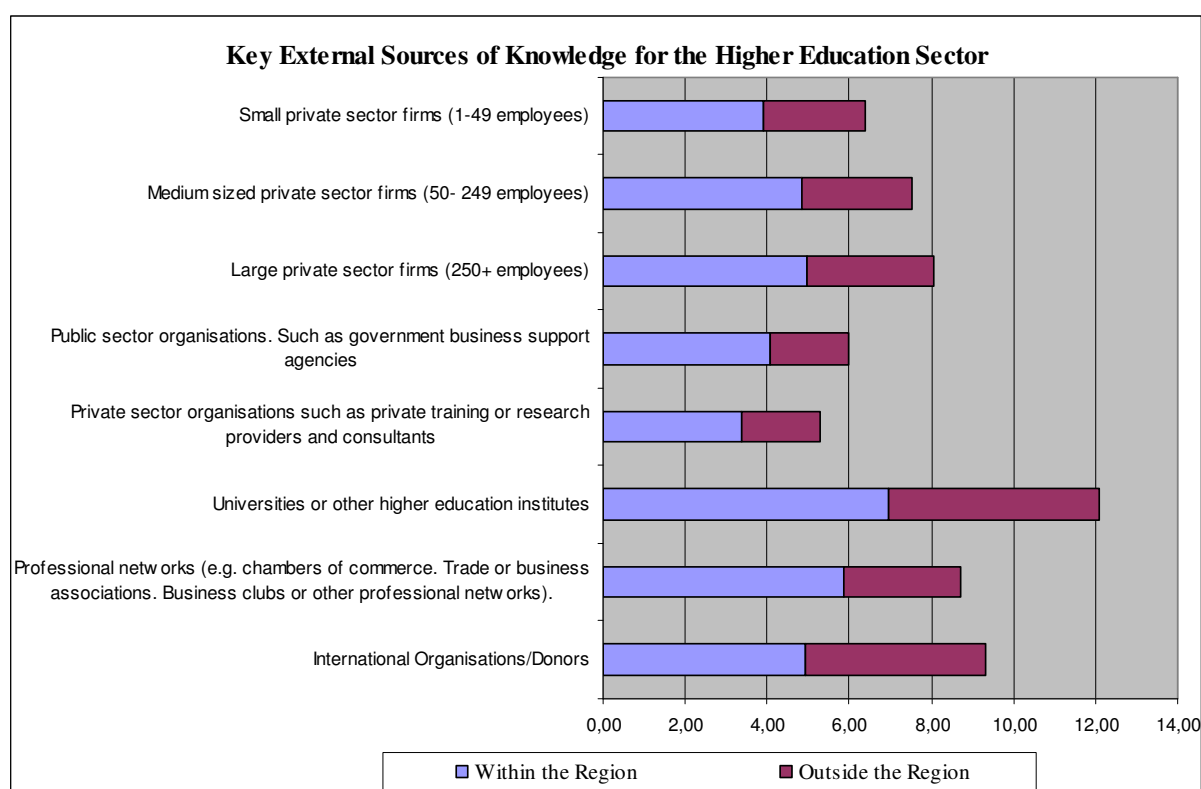


**Figure 4.11: Future Policy Directions to Improve Competitiveness (as perceived by SMEs)**

| Recommendation 11   | Rationale   |
|---|---|
| Organisation of science and technology fairs in the region will contribute in changing the managerial agenda. This should be focused to the regional needs. | Finance and infrastructure have been shown as the leading requirement for the last twenty years. Low access to the international networks do not allow the regional SMEs to absorb the market changes in the knowledge economy. |

## 4.7. The Knowledge Networks of Universities

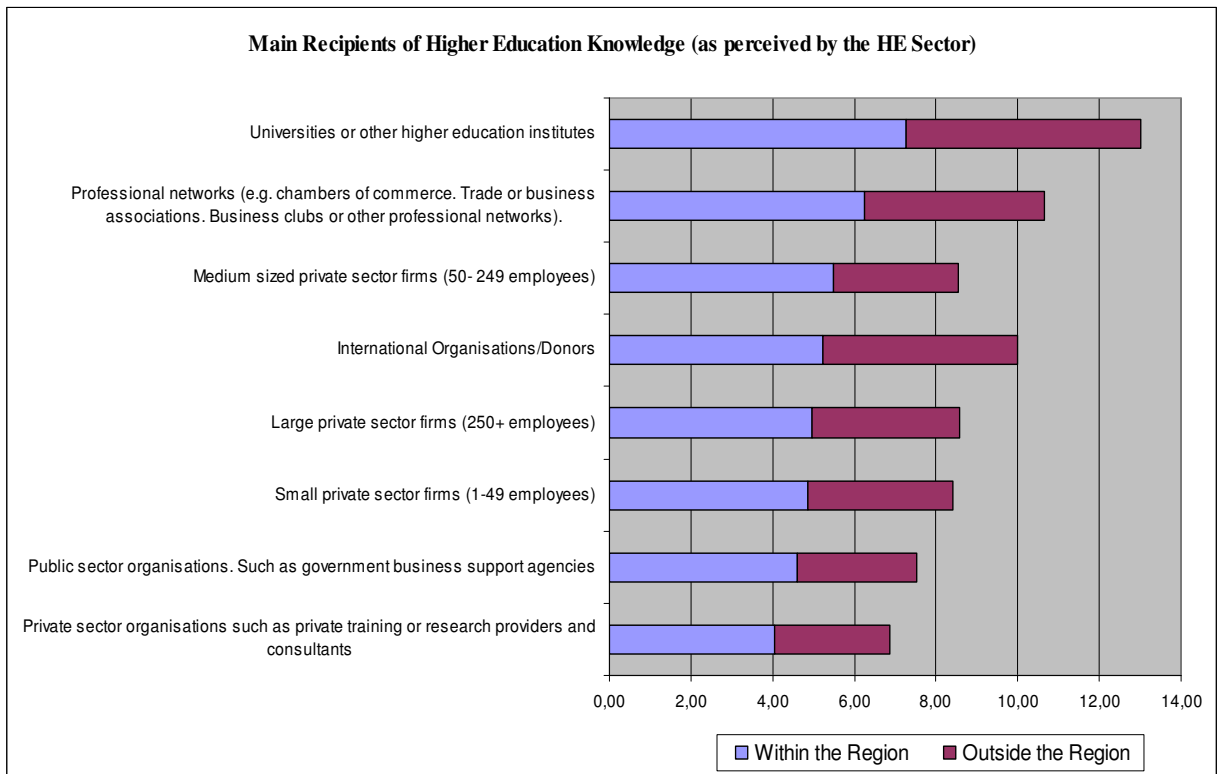
From the perspective of universities in the region, their key sources of knowledge tend to be other universities mainly within the region, followed by international organisations. Less knowledge is sourced from private sector training and research organisations and government business support agents. Professional networks are also an important resource of knowledge for the universities.



**Figure 4.12 Key External Sources of Knowledge for the Higher Education Sector**

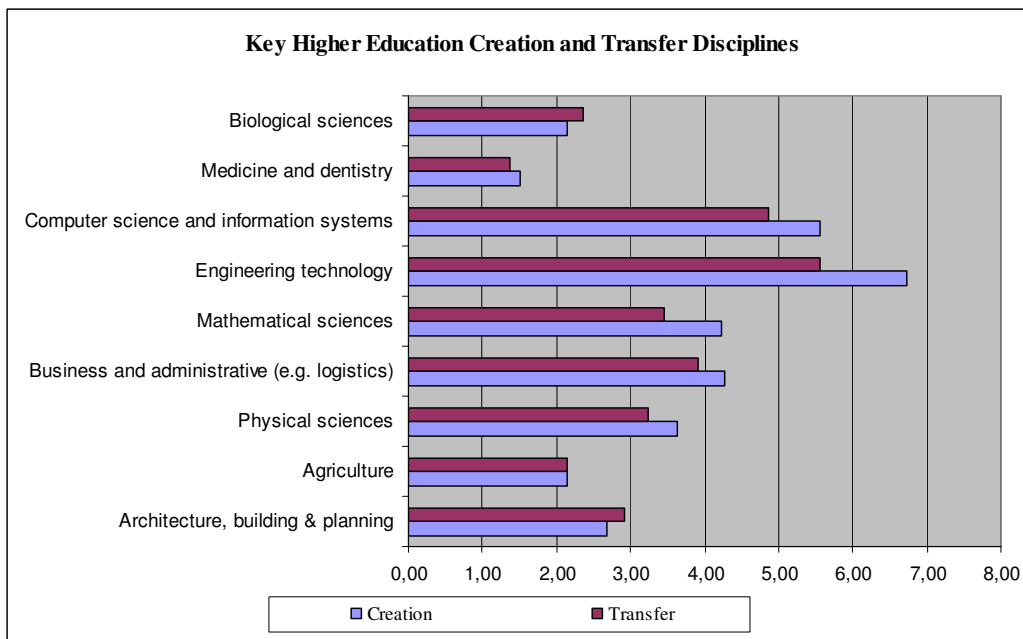
The other universities, professional networks and the international organisations are also considered by universities to be the key recipients of the knowledge they generate. Knowledge demand is expected by the universities rather than proposing and commercialising it.

| Recommendation 12   | Rationale   |
|---|---|
| Provide support to develop a regional network of universities that could start asking for the value of knowledge created. | Current knowledge exchange among the universities is based on scientific documents and courses. The new incentives which will be available in 2008 can be defined to include innovation based collaboration among the universities. |



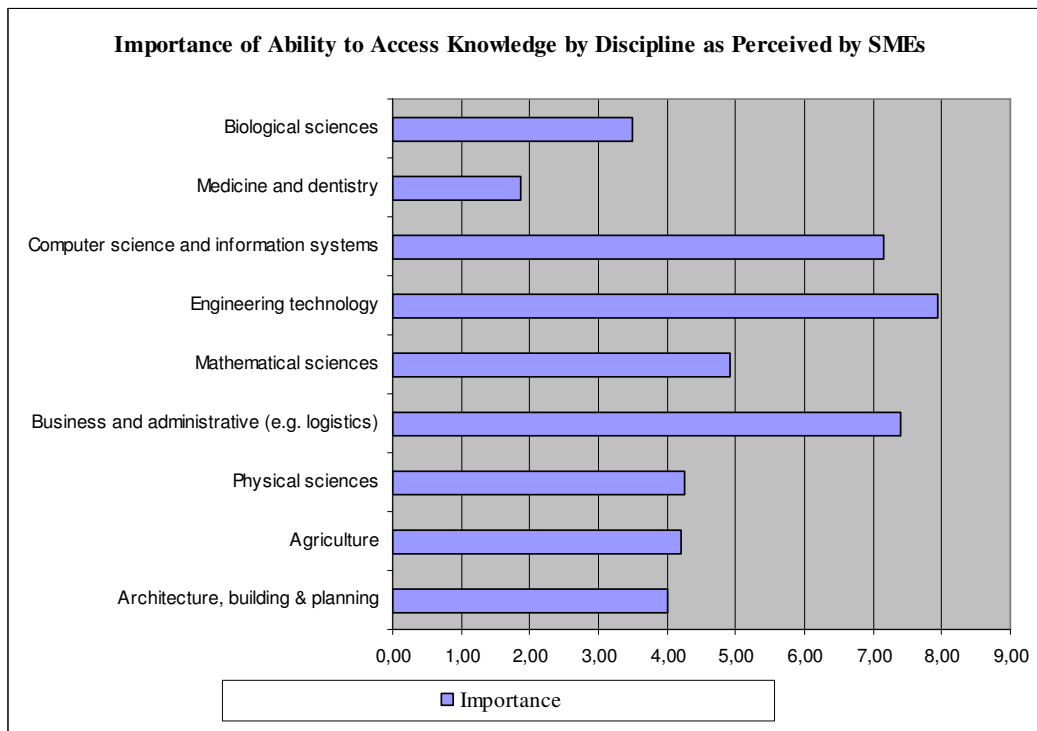
**Figure 4.13: Main Recipients of Higher Education Knowledge (as perceived by the HE Sector)**

Figure 4.14 illustrates the key knowledge both created and transferred by universities in Thrace-Turkey. Given the academic evaluation criteria it is not surprising to observe engineering technologies and computers and information technologies as the key areas of both knowledge creation and transfer. It is to be noted that although IT knowledge is created it was not in use by the SMEs.



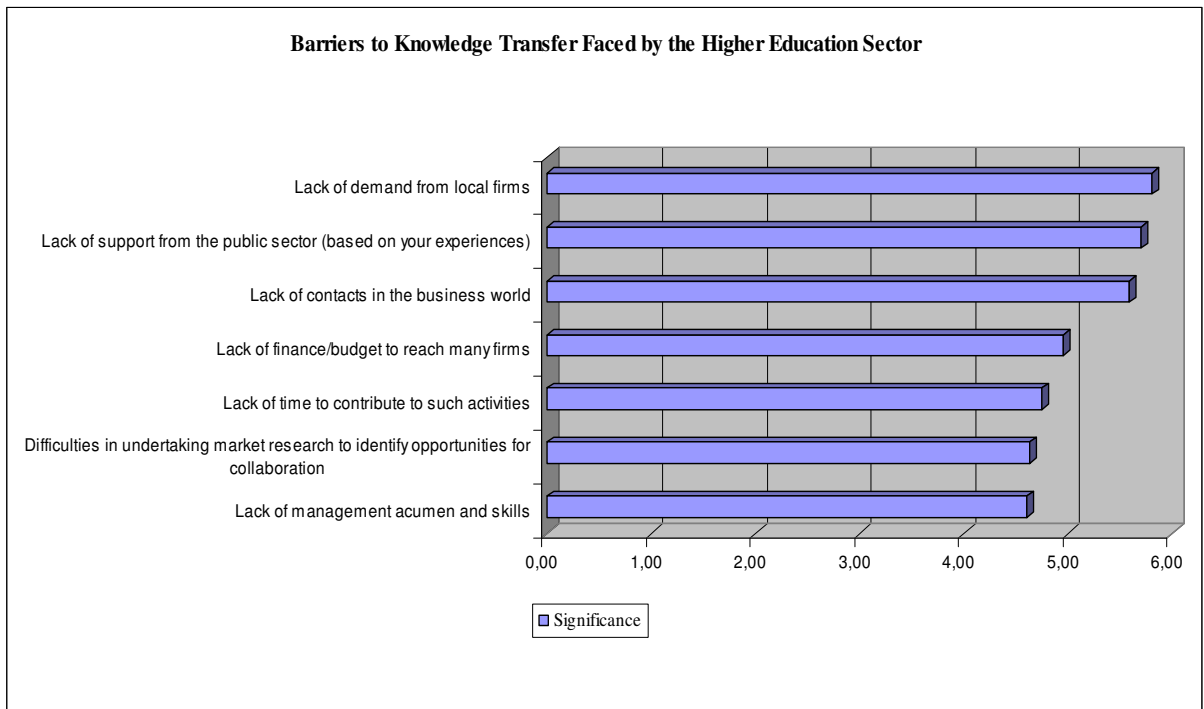
**Figure 4.14: Key Higher Education Creation and Transfer Disciplines**

In order to gauge the discipline match between university knowledge creation and transfer and potential SME demand for such knowledge, SMEs rated these disciplines in terms of access importance, as shown in Figure 4.15. Engineering knowledge has the highest importance and medical knowledge has the lowest importance in both of them. Growing business knowledge creation is also requested by the SMEs, however there is no match for the scientific fields like mathematics and biology. Agricultural knowledge is in demand but not enough created in the region. The comparison of the two tables emphasises the need for support of SME collaboration with the universities.



**Figure 4.15: Importance of Ability to Access Knowledge by Discipline as Perceived by SMEs**

According to universities, the key barriers they face to undertaking effective knowledge transfer are a lack of business demand, lack of public and private support for the contracts. These factors again suggest that collaboration is overlooked in policies.



**Figure 4.16: Barriers to Knowledge Transfer Faced by the Higher Education Sector**

| <b>Recommendation 13</b>   | <b>Rationale</b>   |
|--|--|
| Provide support to establish business relations units in the Universities. | Demands are not detected by knowledge creators although the need of business support is highlighted. |

## 8. Financing the Knowledge Economy

Financial resource provided by the government for R&D in science and technology is doubled in 2007. A key issue is that TUBITAK is the main organisation of allocation of support and evaluation is rated by project. International collaborations, mainly EU projects are rated higher than regional collaborations. There are no policies related to the regional needs and or competence levels. This causes difficulties for smaller regional universities and SMEs to access the resources. However, these policies encouraged large companies to work with the universities for state funded projects or EU projects.

Another key issue in developing countries is that there is not enough national capital for the risk investments. The venture capital is currently non-existent in the region. There is an opportunity to attract the foreign venture capital through innovation centres that are starting in Istanbul.

| <b>Recommendation 14</b>   | <b>Rationale</b>  |
|--|---|
| Support collaboration of universities and newly established innovation companies to attract foreign venture capital. | Innovation involves the risk of committing resources which is not available in regional SMEs and or public organisations. |

#### 4.9. Analysis of Key Findings

One of the key points to arise from the MIRIAD findings is that many SMEs located in Thrace Turkey tend to utilise and value business networks more than universities. This suggests that more important roles are to be designed for the intermediary business organisations.

SMEs with higher financial capital source knowledge more frequently from customers and suppliers inside or outside the region. However, it is observed that there is a lack of collaboration among the SMEs although there is a considerable socialisation. This indicates that the issues for regional competitiveness are not yet clear for the business in the region. SMEs also lack collaboration with universities as well. Both sides avoid making effort since the innovation concepts are not clear for either party.

Knowledge creators, universities and research institutes are observed to work in a closed loop of similar organisations in Turkey or globally.

| <b>Recommendation 15</b>  | <b>Rationale</b>   |
|---|--|
| Support creation of international projects that can be implemented by collaboration of universities and SMEs. | Processes of globalisation mean that state-of-the-art knowledge is less likely to be sourced within regional boundaries. |

#### 4.10. Future Policy Approaches

Industrial analysis in Turkey is made on national bases or by provinces rather than regions. This avoids the recognition of SME demands in different provinces. Clustered approach is only used for the textile exporters recently. MIRIAD project has shown clearly that a clustered regional analysis is an absolute need to define the business focus. It has been observed that innovation can be triggered in certain fields which only exist in one or two towns of each province-as in organic food technologies. The fact that Thrace-Turkey is located in the borders of Bulgaria and Greece, these clusters can increase the trading among the neighbour countries.

| <b>Recommendation 16</b>  | <b>Rationale</b>                                       |
|---|--|
| Define regional priorities based on clusters. Create success stories to encourage the SMEs. | There is a lack of linkage between SMEs in the region. |

#### *A Knowledge Network and Knowledge Market Approach*

SMEs in Thrace-Turkey clearly state the demand for new markets that can be created through the professional networks if the chambers of commerce and industries took the leadership role in the region. Two reasons make the leadership of professional networks critical for the economic development of the region: 1) joint power in these organisations will enable the creation and accessibility of regional knowledge resources; 2) International venture capital can be attracted if level of dynamics is increased by regional collaboration and international trading. It is observed that large companies in the region have understood the importance of innovative collaboration and started using the benefits of knowledge created by the universities. Commercial and Industrial chambers can act as large companies with the support of numerous members, SMEs that will finally benefit the results.

These networks are to be encouraged not to create and access knowledge resources in a close loop but the stimulus is to be given for the entrepreneurship in knowledge based companies which will take the intermediation among the SMEs and the universities. Knowledge suppliers will not always be willing, or in a position, to transfer knowledge across networks, where this a low expectancy of valid economic return, as has been argued is often the case with university-SME mal communication in the region, with the flow of knowledge, and subsequent value added, tending to be one directional. This potentially has an impact on the ability of those demanding knowledge, such as SMEs, to absorb and infuse it. Therefore, there is clear policy role in ensuring that knowledge transfer opportunities are not lost through the lack of a knowledge market, and secondly, where knowledge markets are developed their transformation to networked forms of interaction is encouraged and facilitated.

| <b>Recommendation 17</b>   | <b>Rationale</b>  |
|--|---|
| Develop knowledge based networks and markets by giving a more important role to the professional networks. | There is a perception that the higher education is still a very difficult sector for firms, especially SMEs, to access. |

### *Removing Cultural Barriers*

There is clear need to focus on the continuing cultural barriers the region has faced in attempting to establish a regional knowledge-based environment. This is a difficult task to achieve, but there would appear to be a stronger role for policymaking in this respect. There is a clear need for regionally focused policies to explain and disseminate the benefits of collaborative innovation. This can not be handled neither by a single organisation nor a single company. A regional council established by public and private organisations including the university representatives will be recommended to define more focused and effective regional policies to remove the cultural barriers.

| <b>Recommendation 18</b>  | <b>Rationale</b>  |
|---|---|
| Establish a regional council consisting of private and public sector and university representatives with the main target of defining regional policies focused on regional needs of removing the cultural barriers. | Although national level enterprise policies have developed lately, there is no regional policy approach. NII is the only organisation recommending to develop based on regional policies. |

### *The Role of Universities*

Universities in Thrace-Turkey are strong in terms of R&D and the MIRIAD strategy recommends supporting the continuing excellence of the region's universities. Universities should also be considered as the creator of skilled human resources by regular courses and certificate programs. The surveys clarified the lack of innovation culture except in a few foundation universities as Sabanci. The bureaucratic difficulties of changing the curriculum is one of the barriers for initiating new knowledge based courses. They can be supported to initiate new certificate programs for SMEs and add new courses in the curriculum in the long term.

| <b>Recommendation 19</b>   | <b>Rationale</b>  |
|--|---|
| Encourage universities to introduce new innovation based courses and certificate programs. | The dependency on the region's universities as principal knowledge creators means that there are likely to be regional supply gaps concerning knowledge outside the R&D, science and technology producedç |

### *Achievements of MIRIAD Project*

MIRIAD project is given high importance by the regional players in Thrace Turkey. The strategies proposed in this report are the outcome of three workshops run in two years and the integration of all the recommendations by the policy makers including TUBITAK, KOSGEB, NII and Chambers. The discussions are already well digested by the participants and the following outcomes are achieved:

- Edirne Chamber of Commerce and Industry takes the lead to remove the cultural barriers for innovation in Kırklareli, Tekirdağ and Edirne. A meeting for all the regional chambers to discuss future activities is planned for January 2008.
- NII has considered MIRIAD as one of the two initial regional projects in Turkey and has taken the MIRIAD strategies in the program of national training.
- ISO has signed a collaboration contract with Istanbul Technical University to respond to the needs of SMEs through the engineering graduation projects. First implementation with the Industrial Engineering Department has been realised in spring 2007 and 30 ITU 4<sup>th</sup> year students worked with ISO assigned companies for six months.

Importance of innovation in economical development is being clear in Istanbul. The increase in service sector in 2006 is an indication of interest in the knowledge based market.

## 11. Summary of Recommendations

The following summarises the recommendations proposed by this study:

| <b>Recommendation 1</b>   | <b>Rationale</b>  |
|---|---|
| Ensure that future policies are committed to furthering innovation in the broader sense, rather than being restricted to a narrower focus on R&D.   | Due to recessions of the 1980s and 1990s, which decimated many of the regionally established large firms, the business stock is comprised of a larger proportion of younger firms, often in service-based sectors, that are not sufficiently developed in terms of their ability to innovate. |
| <b>Recommendation 2</b>   | <b>Rationale</b>  |
| Continue to build on the work of Yorkshire Science to develop a methodology that focuses on the change in attitudes towards innovation as part of a region wide methodology sensitive to measuring changes in innovation culture. | Promoting cultural changes requires relatively sophisticated and sensitive methodologies in order to measure the impact of policy, particularly policies the impact of which will only be determinable over a significant period of time.   |
| <b>Recommendation 3</b>   | <b>Rationale</b>  |
| Develop new regional metrics that incorporate a holistic means of measuring investment in knowledge.  | Whilst R&D expenditure continues to be an important measure of innovation and the conversion to a knowledge-based economy, it is limited due to its relative inapplicability to growing service-based sectors.  |
| <b>Recommendation 4</b>   | <b>Rationale</b>  |
| Identify and prioritise the growth of the region's leading knowledge-based SMEs.  | Despite the fact there are a number of top universities within the region the retention of postgraduate students in the region is very low. The region has problems retaining and attracting skilled workers.   |
| <b>Recommendation 5</b>   | <b>Rationale</b>  |
| Streamline the maze-like business support infrastructure, reducing red tape and excessive bureaucracy and improving its 'user friendliness'.  | Although numerous regional initiatives have been put in place to provide 'business gateways' and 'one-stop-shops' entrances to universities, most SMEs are still very reluctant to enter.   |
| <b>Recommendation 6</b>   | <b>Rationale</b>  |
| Review the consistency between policies   | Alongside regional policy development,  |

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|---|---|
| and initiatives at the regional and sub-regional (city/city-region, locality) level to ensure 'scale economies' are achieved.   | a range of institutions have been established in recent years at the sub-regional level related to knowledge transfer and innovation development that is not necessarily consistent with regional policymaking. |
| <b>Recommendation 7</b>   | <b>Rationale</b>  |
| Regionally-focused marketing exercises should be introduced to promote and embed the link between competitiveness and innovation across the business community.   | Although an innovation culture exists in pockets, it is still far from being integrated across the region as whole, and differs across segments of both the region's economy and society                        |
| <b>Recommendation 8</b>   | <b>Rationale</b>  |
| Provide further resources to develop innovative tools to measure the determinants of SME competitiveness and demand for knowledge.  | The MIRIAD initiative has attempted to develop an SME competitiveness benchmarking tool, but further work is required in this area.   |
| <b>Recommendation 9</b>   | <b>Rationale</b>  |
| Ensure public sector business support initiatives more proactively engage with both high and low levels of growth, rather than reactively wait to be approached by SMEs experiencing competitive pressures. | At present, SMEs in the region experiencing relatively low levels of growth are more likely to utilise public sector business support initiatives as sources of knowledge.                                      |
| <b>Recommendation 10</b>  | <b>Rationale</b>  |
| Provide support to SMEs to engage in sustained and long-term collaborative ventures.  | Engagement with universities is often a long-term venture where as small firms usually require solutions in the short term.   |
| <b>Recommendation 11</b>  | <b>Rationale</b>  |
| Develop new sources of both private and public sector venture capital.  | Innovation involves the risk of committing resources – especially financial capital - towards an uncertain outcome. The region had a clear lack of risk capital.  |
| <b>Recommendation 12</b>  | <b>Rationale</b>  |
| Facilitate the engagement of SMEs in global knowledge networks.   | Processes of globalisation mean that state-of-the-art knowledge is less likely to be sourced within regional boundaries.  |
| <b>Recommendation 13</b>  | <b>Rationale</b>  |
| Refocus regional economic development policy from a 'cluster approach' to a 'regional innovation system' approach   | There is a lack of linkage between SMEs and the regional knowledge base. The integration of the region business   |

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| that prioritises the creation of knowledge networks linking the region's SMEs to its universities.   | community – the majority of which consists of SMEs - with the higher education system is a very important starting point.  |
| <b>Recommendation 14</b>   | <b>Rationale</b>   |
| Enhance the transparency of university-business knowledge processes by disseminating examples of successful practices from the region.   | There is a perception that the higher education is still a very difficult sector for firms, especially SMEs, to access.  |
| <b>Recommendation 15</b>   | <b>Rationale</b>   |
| Promote the development of regional knowledge markets to complement regional knowledge networks.   | Universities aim to produce world-class research, and of the 'problems' faced by regional firms are sometimes considered too 'basic,' reducing the incentive for collaboration.  |
| <b>Recommendation 16</b>   | <b>Rationale</b>   |
| Prioritise knowledge-driven entrepreneurship ensuring that entrepreneurs with sound ideas and visions for creating high value added businesses have access to suitable resources.      | Although national level enterprise policies have developed in recent year, such policies do not sufficiently prioritise the knowledge-based entrepreneurship required by the region.   |
| <b>Recommendation 17</b>   | <b>Rationale</b>   |
| Lobby national government to ensure that innovation and enterprise become a key feature of the compulsory education curriculum the wider system of training and workforce development. | The development of a sustainable innovation culture must be led by the region's education system – and not just higher education, but also primary, secondary and further education.   |
| <b>Recommendation 18</b>   | <b>Rationale</b>   |
| Regular and systematic monitoring to be introduced to understand how the region's innovation culture is evolving.  | There is a need to understand why there is a lack of an innovation culture in the region and to examine which interventions are most likely to create improvement.   |
| <b>Recommendation 19</b>   | <b>Rationale</b>   |
| Extend regional policymaking to incorporate other knowledge generating actors other than universities, in particular the region's further education system and NHS.                    | There is a need to be realistic about the level of assistance SMEs can receive from universities. Exploiting research by universities is not a panacea and there is danger that it has come to be regarded as an 'easy' method to solve the problem of low regional R&D. |
| <b>Recommendation 20</b>   | <b>Rationale</b>   |

Identify and plug gaps in the region's knowledge base.

The dependency on the region's universities as principal knowledge generators means that there are likely to be regional supply gaps concerning knowledge outside the R&D, science and technology produced by these universities.