Scotland's international competitiveness within Western Europe

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Abstract

The paper measures regional competitiveness of Scotland in comparison to ten EU regions and small countries using the International Benchmarking Index Family ('IB Index Family') developed by BAK Basel Economics.[1] The IB Index Family contains an index with three dimensions of competitiveness: *Performance, Attractiveness and Structural Potential.* The *Performance Index* measures recent economic success; the *Attractiveness Index* measures how well a region is an attractive location to companies and highly-qualified individuals; and the *Structural Potential Index* estimates future potential economic growth based on current economic structure. The application of the IB Index Family provides a first-step into a more in-depth benchmarking of the competitiveness of a region, which is necessary when working towards detailed policy conclusions. The paper explains these measurement tools and applies them in a short benchmarking analysis of Scotland and ten EU regions and small nations (e.g. Ireland, Norway, Western Sweden etc.).

1. Introduction

Nations and regions are increasingly exposed to international competition and globalisation. In this context, a competitive economy is crucial for robust economic growth and for providing a high level of prosperity to its citizens.

Indices are highly valuable tools in summarising and communicating the most important economic issues and assessing complex topics like competitiveness. The International Benchmarking Index Family (IB Index Family) developed by BAK Basel Economics (BAKBASEL) offers a sophisticated approach for measuring the competitiveness of European regions. It is based on the extensive economic data for nations and regions available in BAKBASEL's International Benchmark Database (IBD) (BAKBASEL 2012).

The IB Index Family contains an index for each of three dimensions related to a regional economy's competitiveness: *Performance, Attractiveness and Structural Potential.* Firstly, a competitive region is characterised by successful economic development. Therefore, the Performance Index measures recent economic success. Secondly, a competitive region must be an attractive location for companies as well as for highly-qualified individuals. This is assessed in the Attractiveness Index. Finally, a competitive region possesses an economic structure which will build the foundation for strong economic growth in the future. The Structural Potential Index estimates a region's potential future economic growth based on its current economic structure.

The IB Index Family provides an easily understood overview of a region's competitiveness when benchmarked internationally. The application of the IB Index Family can be the first step to a more in-

[11]*BAK Basel Economics AG (BAKBASEL) is a private, independent economic research institute based in Basel, Switzerland. It was established in 1980 as a spin-off from Basel University. It has 30 years of experience of providing economic analyses, forecasts and consulting services on an empirical and quantitative level to clients across Europe.*

depth benchmarking of the competiveness of a region, which is necessary when working towards detailed policy conclusions. The construction of the indices in combination with the underlying vast database allows extensive "drilling down": Starting from the quickly provided overview all the necessary details for strategic decisions and policy shaping can be achieved in a continuous and consistent process.

Overall, this paper addresses the following questions:

- How can we measure regional competitiveness?
- What are Scotland's strengths and weaknesses in terms of competitiveness?
- What do these results imply for Scotland's future prospects with respect to potential constitutional change (political independence)?

This paper begins with an explanation of the IB Index Family which is then applied in a brief benchmarking analysis of Scotland[2] and eleven European regions and small nations. After introducing the benchmarking sample, the benchmarking analysis starts with an analysis of the economic performance of Scotland compared to its benchmarking partners. The Performance Index will then be explained and applied. After that, the Attractiveness Index will be introduced. It benchmarks the quantity and quality of important location factors in Scotland against the selected sample. Then, using the Structural Potential Index, Scotland's future economic potential will be assessed given its economic structure today. The paper closes with a summary of the strengths and weaknesses of Scotland's economy and reflects on the possible economic impact of constitutional change.

2. Scotland and its benchmarking sample

Choosing the regions to be included in the benchmarking followed a number of criteria with the aim of comparing Scotland with the most relevant regions and small countries in Europe.

Eleven key European regions or countries were chosen for benchmarking. The selection consists of regions and small countries with an economic-geographic situation similar to Scotland (population size, geographical position). Furthermore, regions were selected to guarantee diversity with respect to economic systems (Anglo-Saxon, Continental and Nordic) as well as some regions or small countries with strong economies.

Some small countries (Ireland, Switzerland and Norway) are included in order to compare Scotland with geographical entities of similar size but independent. Two UK regions (North West England and Wales) are included to enable comparison of Scotland to other non-independent regions of the UK. Furthermore, Baden-Württemberg, Rhône-Alpes, Catalonia and Lombardy are included as members of the international "Districts of Creativity",[3] a network of which Scotland is a member as well.

[2] More detailed benchmarking analyses for Scottish regions were conducted by BAKBASEL for Metro Edinburgh (BAKBASEL 2006) and the City-region Glasgow (BAKBASEL 2005a, 2008).
[3] Refer to -http://www.districtsofcreativity.org/about

Table 1: Benchmarking regions/countries

Benchmarking regions			
Region/country	definition of region	Population 000's	GDP/capita 000's
Scotland	Country (NUTS1)	5261	39
Ireland	Country (NUTS0)	4585	46
Norway	Country (NUTS0)	5053	99
Switzerland	Country (NUTS0)	8049	75
Wales	Country (NUTS1)	2950	29
West Sweden	Västsverige region (NUTS2)	1905	52
Catalonia	Barcelona, Girona, Lleida and Tarragona regions (NUTS4)	7236	35
Baden-Württemberg	Bundesland (NUTS1)	10815	46
North-Holland	Kop van Noord-Holland, Alkmaar en omgeving, Ijmond, Agglomeratie Haarlem, Zaanstreek, Groot-Amsterdam and Het Gooi en Vechtstreek regions (NUTS2)	2672	54
North West of England	Cumbria, Cheshire, Greater Manchester, Merseyside and Lancashire regions (NUTS1)	7022	33
Lombardy	Bergamo, Lecco, Sondrio, Brescia, Cremona, Lodi, Mantova, Pavia, Milano, Como and Varese regions (NUTS2)	9981	41
Rhône-Alpes	Ardèche, Drôme, Loire, Isère, Ain, Rhône, Haute-Savoie and Savoie regions (NUTS2)	6396	40
Western Europe	Germany, France, Italy, Great Britain, Spain, Sweden, Belgium, Netherlands, Denmark, Ireland, Luxembourg, Austria, Portugal, Finland, Norway, Switzerland, Greece*	412678	40

**Greece has been excluded of the Western Europe aggregate due to data inconsistencies*

NUTS = Nomenclature des Unités Territoriales Statistiques, EUROSTAT 1981

Source: BAKBASEL

3. Benchmarking economic performance

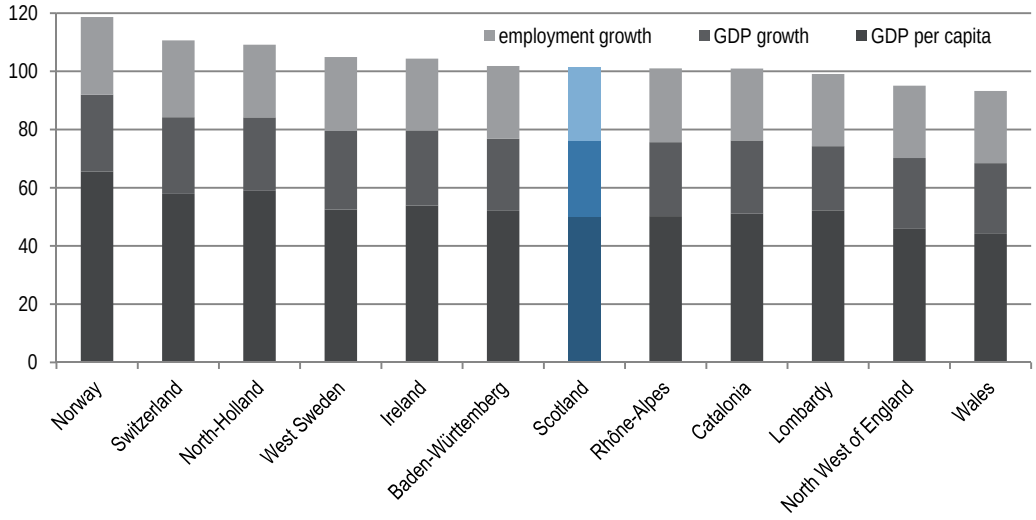
The Performance Index describes the competitiveness of a region by summarising its recent economic performance. It measures both the level of economic activity as well as the dynamics of the economy. Both components are important for the well-being of a region and its inhabitants. The level component of the Performance Index reflects the wealth produced in the region. The growth part of the Performance Index is important for a region in order to achieve additional value added to the economy.

The indicator which best captures the economic activity level part of the Performance Index is GDP per capita. To reflect the growth part of the Index, two indicators are selected: GDP growth and employment growth. GDP growth reflects the advances in the production possibilities of a region. It is also the most common indicator for measuring economic growth. Creating adequate jobs for the population is probably the most important task of economic policy. That is why the achievements in this important area, as indicated by employment growth, are reflected directly in the Performance Index. As the international benchmarking aims to align itself with structural developments rather than with the effects of a single

economic cycle, a ten year average growth rate is used. This period is long enough to cover at least one, often two, economic cycles.

For defining the weights of the three components of the Performance Index, no clear theoretical or empirical guideline exists. Therefore, it has been decided to weigh the level and the growth components equally. Within the growth component, identical weights are given to GDP growth and employment growth. All indices are constructed in similar ways: A value of 100 reflects the Western European average, and a difference of 10 index points equals one standard deviation between the Western European regions (NUTS2).

Figure 1: BAKBASEL Performance Index



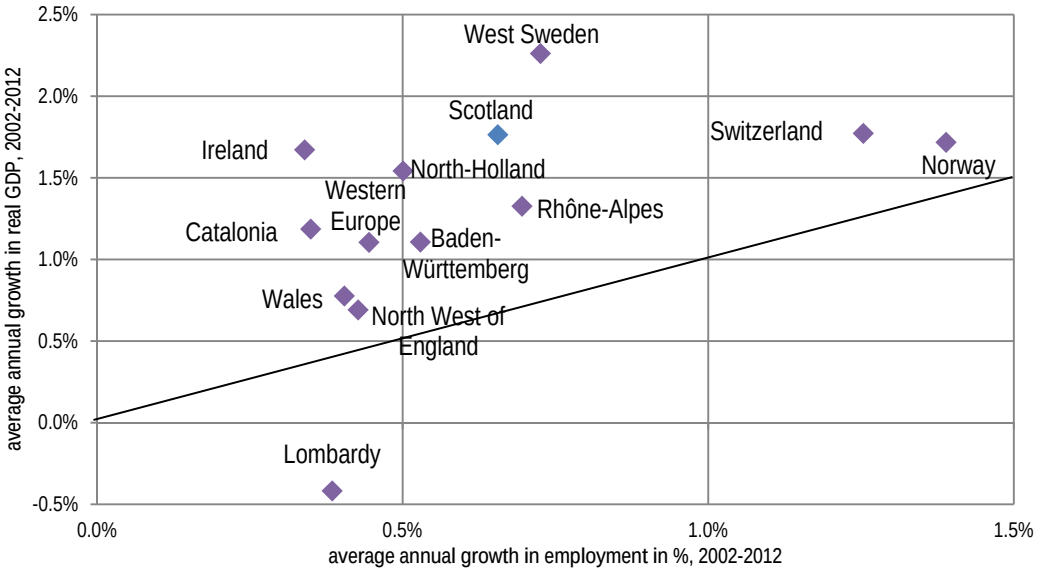
Western Europe = 100; 2012
nominal GDP per capita, real GDP growth ppp adjusted
Source: BAKBASEL

In the Performance Index of 2012, Scotland scores slightly better than the Western European average reflecting Scotland's above average growth in GDP. Its GDP per capita and employment growth, however, are about the same as in Western Europe. Of all UK regions in the sample, Scotland performs best and reaches a higher score than the UK as a whole as well (not shown in the graph). Smaller independent countries (Switzerland, Ireland and Norway) all score better than Scotland: indeed Norway and Switzerland lead the sample. What propels them to the top is their high GDP per capita, while growth in GDP and employment were average over the past decade.

Figure 2 shows the average annual growth rates of GDP and employment of the total economy for the years 2002 to 2012. The bisecting line depicts constant labour productivity, regions above the line achieved labour productivity growth. The distance to the bisecting line reflects the size of the gains (above the line) or losses (below the line) in productivity.

Apart from Lombardy, all benchmarking regions lie above the bisecting line signifying that their labour productivity increased over the past decade.

Figure 2: Growth in GDP and employment



real GDP ppp adjusted

Source: BAKBASEL

The highest productivity gains are found in West Sweden, where GDP rose by 2.3 percent per annum and employment growth was 0.7 percent per annum. At the other end of the scale, Lombardy saw a remarkable loss in productivity. Its GDP shrank on average 0.4 percent per annum while employment increased by the same percentage.

Scotland's growth in GDP (+1.8% p.a.) was the second highest (together with Switzerland) after West Sweden. Employment growth was above average as well (+0.7% p.a.), but it expanded only about half as quickly as GDP. That means that Scotland achieved its GDP growth through a considerable gain in productivity.

Productivity and productivity growth are two major factors influencing the competitiveness of a region. The above average productivity growth in Scotland engenders a bright outlook for its future competitiveness and is the main reason why Scotland scores so well in the Performance Index.

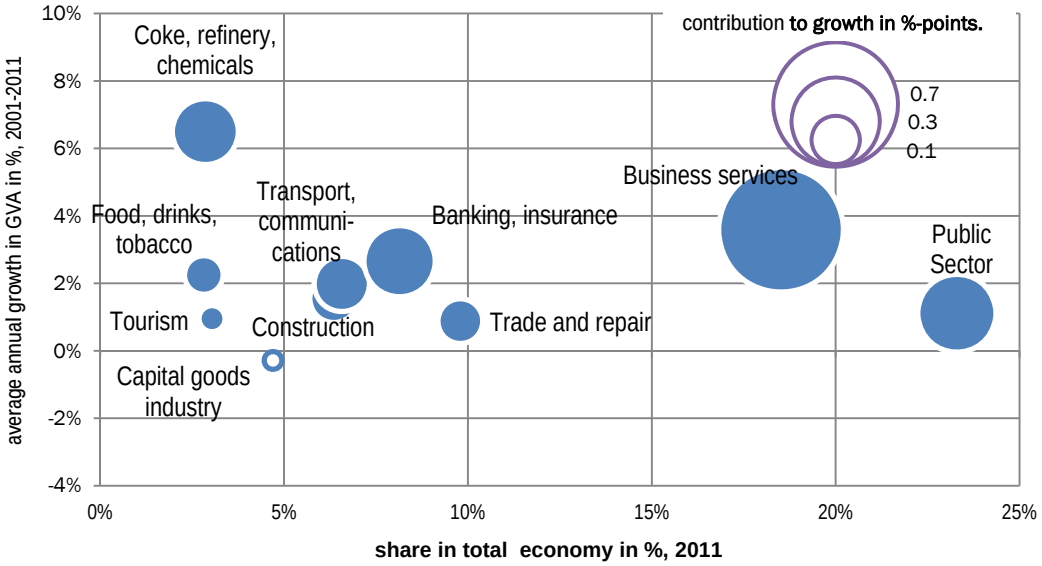
Which industries are the driving factors behind this performance?

The bubble chart shows the development and the average share of the ten key industries in Gross Value Added (GVA) in the last decade (2001-2011). The size of the bubble corresponds to the contribution of the industry to the economy's overall growth.

Analysing the growth contribution of the ten key industries reveals some remarkable results. Business-services is the most important key industry. On average, it contributed about 45 percent to the total GDP growth.

The banking and insurance industry achieved a remarkable contribution to growth even though the 2008 financial crisis is fully included in the analysed time period. This result is not simply due to high growth rates prior to the financial crisis. Scotland's banking and insurance industry expanded despite the crisis.

Figure 3: Growth contribution of selected sectors in Scotland



Growth in real GVA ppp adjusted; share in nominal GVA of total economy

Source: BAKBASEL

The chemical (including pharmaceutical) industry (aggregate of «coke, refined petroleum products, nuclear fuels and chemicals and chemical products») showed the highest growth in real GVA over the last decade (+3.5% p.a.). This strong growth was due to the rapid expansion of the chemical and pharmaceutical industry. In contrast, the coke and refined petroleum products sector shrank.

The tourism sector is composed of hotels and restaurants. Its growth of 1.0 percent in real GVA is considerable given the slump created by the financial and sovereign debt crisis in the EU. Its development was supported mainly by city tourism.

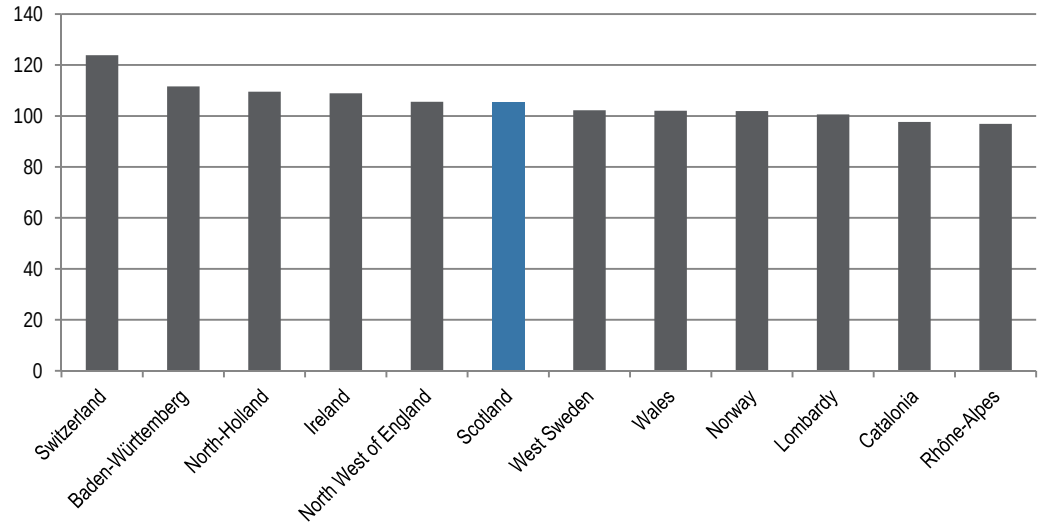
4. Attractiveness: Measuring and Comparing Location Factor Quality

The Attractiveness Index reflects the ability of a region to attract and retain both companies and human capital. In a globalised economy, the ability to attract these valuable resources is crucial to a region's competitiveness. Although attractiveness cannot be measured directly, various indicators in different areas are available which, together, paint a picture of the attractiveness of a region. Company surveys (such as the International Company Survey conducted by BAKBASEL in 1995, BAKBASEL 1995) demonstrate that when deciding on a company location, the tax burden, accessibility, quality of life, innovation capacities and regulation of markets are the most decisive factors. With the exception of quality of life (due to limited data availability) all these factors are covered in the Attractiveness Index. Thus, the Attractiveness Index covers nine indicators grouped into the following four areas: taxation (tax burden manpower and company), accessibility (global and continental), regulation (labour and product

market) and innovation (patents, publications and Shanghai Index). The weighting of the indicators is explained in the appendix.

Figure 4 displays the BAKBASEL Attractiveness Index for 11 regions and small countries in Europe.

Figure 4: BAKBASEL Attractiveness Index



Western Europe = 100; 2012

Source: BAKBASEL

On the Attractiveness Index, Scotland scores adequately well and is positioned in the middle of the BAK Attractiveness Index. Scotland is more attractive than the average of the Western European regions. The most attractive is Switzerland, followed by Baden-Württemberg and North-Holland. Of the 'Anglo-Saxon' regions, Ireland is more attractive than North West England and Scotland, and Wales is slightly less attractive than Scotland. Despite its high level of wealth, Norway ranks well behind the English-speaking countries and regions with respect to attractiveness as do Catalonia and Rhône-Alpes.

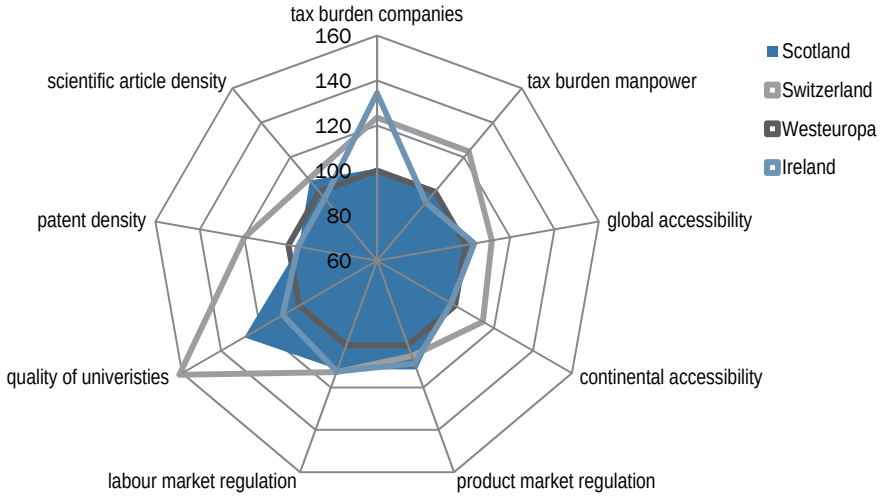
Which specific factors contribute to the attractiveness of Scotland? Figure 5 summarises Scotland's achievements with respect to the various indicators of the key location factors of attractiveness.

Taxation: Taxation is a key topic particularly for businesses evaluating the attractiveness of a location. Tax competition is an oft-discussed issue. BAKBASEL measures the tax burden on companies and on highly qualified people. [4] Highly qualified people are usually more mobile (interregionally and internationally) than other workers and they become increasingly important as locations make structural changes towards knowledge-based economies. Some countries, particularly small countries, often follow a strategy of lowering taxes to support economic growth. The ongoing competition between countries, particularly in company taxation, is evident in the graph (Figure 6). All of the countries lowered their tax

[4] *For more information see www.baktaxation.ch. For detailed technical information on the models see for highly qualified manpower Elschner and Schwager (2005) and Lammersen and Schwager (2005) for company taxation. Latest commented results can be found in BAKBASEL (2011).*

burdens on companies between 1990 and 2011 and some countries (e.g. Sweden, Germany or Norway) have *significantly* lower taxes today.

Figure 5: Summary: Quality of location factors



Source: BAKBASEL

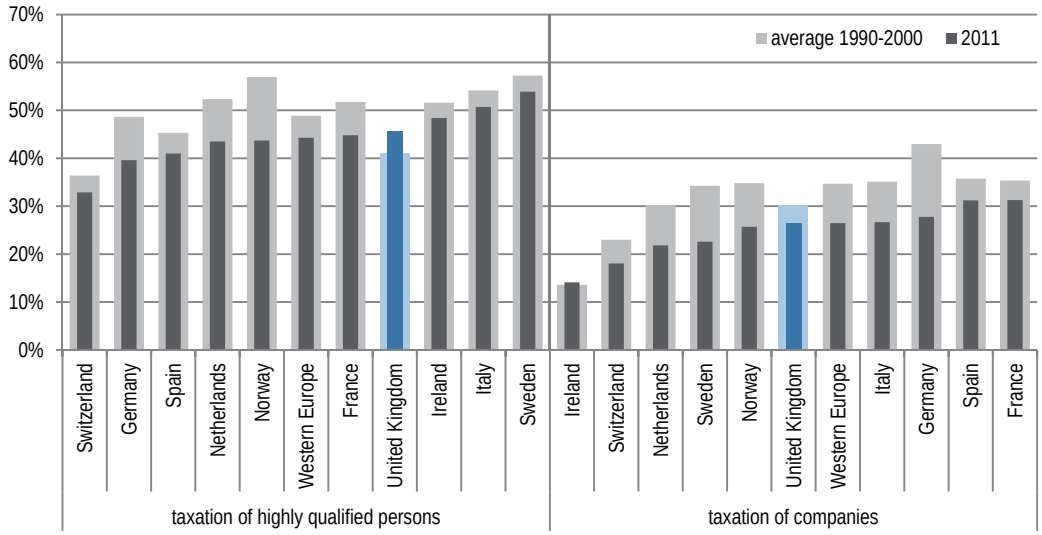
In the UK, taxation is determined by the UK government and, therefore, is not in the power of Scotland to regulate. The formerly moderate UK company taxation level is not as favourable today as it was in the 1990s, although it is still slightly below the Western European average. But the UK's relative position vis-à-vis its competitors has clearly weakened. However, the situation is even worse with respect to the tax burden on highly qualified persons: this has increased in the UK, while all other benchmarking countries have decreased their taxation of highly qualified manpower. In 2011, the UK tax burden for highly qualified manpower is actually slightly above the average burden in Western Europe. Interestingly, Ireland has the lowest taxation level for companies, but it taxes highly qualified people somewhat higher than the UK. In this sample, only Italy and Sweden have even higher rates.

Regulation: The links between regulation and economic performance are complex. In short, a more liberal product market may result in a higher level of competition and a more efficient allocation of resources. More liberal labour markets allow faster adoption of the labour input to market conditions changes and lead to a more efficient use of the labour market potential. Hence, more liberal product and labour markets are expected to be positive for economic growth.

Regulation is determined at the national level in the UK and there are no differences between the UK regions.[5] The UK labour market is one of the most flexible in Europe. Moreover, its product market regulations are also very liberal. This positions Scotland very well compared to Western Europe, but also compared to Switzerland, which overall is the most attractive country in the sample.

[5] *For the measurement of regulation, BAKBASEL relies on the work of OECD, amended with several other sources (see OECD regulation database).*

Figure 6: Taxation: Companies and manpower



Effective average tax burden

Source: BAKBASEL, ZEW

Accessibility: In a global economy, connectivity and accessibility are decisive factors in attracting international companies, highly qualified people as well as tourists. Geography and infrastructure are the two determinants of the accessibility of a region or country. The global accessibility indicator measures how well a region is connected to the rest of the world.[6] For that, the geographical location of a region is less important than its transport links to one of the large intercontinental airports. However, in measuring *continental* accessibility, regions located close to the economic centres of Europe have a clear advantage as do those regions located close to a larger airport. Because of Scotland's geographical position in the north of Europe, its index of continental accessibility is below average. Scotland scores better in the *global* accessibility index because the global index is less influenced by geography and Scotland profits from the good connections to London Heathrow, one of Europe's largest hubs.

Innovation: The highly developed economies of Western Europe are not just exposed to (cost-related) competition resulting from globalisation. The goal of these regions and countries is to maintain their competitive advantage, and thereby their high living standards, through innovation. The Attractiveness Index includes three indices which indicate the innovation level of the region or country. An important resource used in the innovation process is top quality academic research measured by the Shanghai Index. Patents and scientific articles are among the indicators best suited to measure the scientific output of an innovation system, particularly a regional innovation system. They are also an indication of the existence of technology transfer from the region to other regional economies. The indicators are reported as a density (per capita) to take the different sizes of the regions into account. Scotland's universities perform well with regard to their research potential and rank clearly better than most of the selected benchmarking small nations and regions. Similarly, the density of scientific articles in Scotland

[6] *For more information on the BAKBASEL accessibility models see BAKBASEL 2005b; recent results are also available at www.bakbasel.com ➔Accessibility.*

is high and above the average. However, the number of patents per capita is not favourable and is below the Western European average. Scotland has not yet managed to tap its full innovation potential.

To sum up, according to the BAK Attractiveness Index, the following factors contribute positively to the attractiveness of Scotland:

- moderate company taxes
- liberal labour and product markets
- high-quality universities
- high density of scientific publications
- good global accessibility

while the following factors make Scotland less attractive than the Western European country average:

- tax levels for highly qualified people
- patent density
- continental accessibility

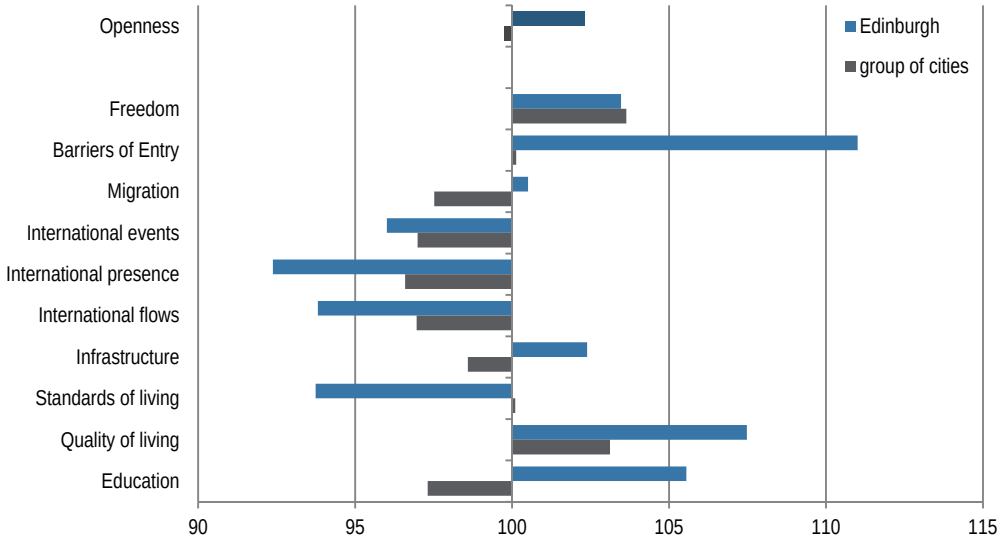
As can be seen from Figure 5, Scotland's attractiveness is near or above the Western European average in most areas. Scotland is thus an attractive location. However, to keep and to attract foreign capital and highly qualified people the level of attractiveness has to be significantly above the Western Europe average. Switzerland, for example, posts values considerably above average in all indicators. Although Ireland is slightly more attractive than Scotland overall, it shares some similar weaknesses: comparably high taxes on manpower, below average continental accessibility and low patent density.

Quality of life and openness are important factors in attracting highly qualified people. As previously mentioned, there is not enough information to measure the quality of life in all regions in Europe. However, there are some good data for cities. The importance of human capital and human creativity as one of the key location factors explaining sustainable economic long-term growth is significant and rising. Urban regions, in particular, compete globally to attract highly qualified and talented labour (Florida 1992). Cities must therefore be attractive and open and provide a tolerant environment to attract and retain international talent and population groups. The OPEN Cities Monitor (www.opencities.eu) identifies the link between international migration and economic growth and measures the multidimensional phenomenon of openness. Within this context, openness is defined as "the capacity of a city to attract international populations and to enable them to contribute to the future success of the city." It is measured with 53 internationally comparable indicators. These indicators are subdivided in 11 areas: migration, quality of living, international flows, standard of living, freedom, international presence, infrastructure, barriers of entry, education, international events and diversity actions.

BAK Basel does not have data on Scotland's quality of life and openness but does have such data for Edinburgh. Figure 7 presents a snap-shot of the results for Edinburgh. Edinburgh is benchmarked against the average results of the city sample (in blue) and against the group of cities with similar population size (in grey). Since the average value of the sample is 100, Edinburgh's values above 100

indicate that its results are above average in that area. As is obvious from the figure, Edinburgh has a high level of education. It has a high quality of life, the barriers to entry for foreigners are low, however its standard of living is somewhat lower than the sample average and its degree of internationalisation is relatively low compared to the sample. Nevertheless, the results suggest that Edinburgh is an open city offering a high quality of living for international populations.

Figure 7: Openness Index for Edinburgh



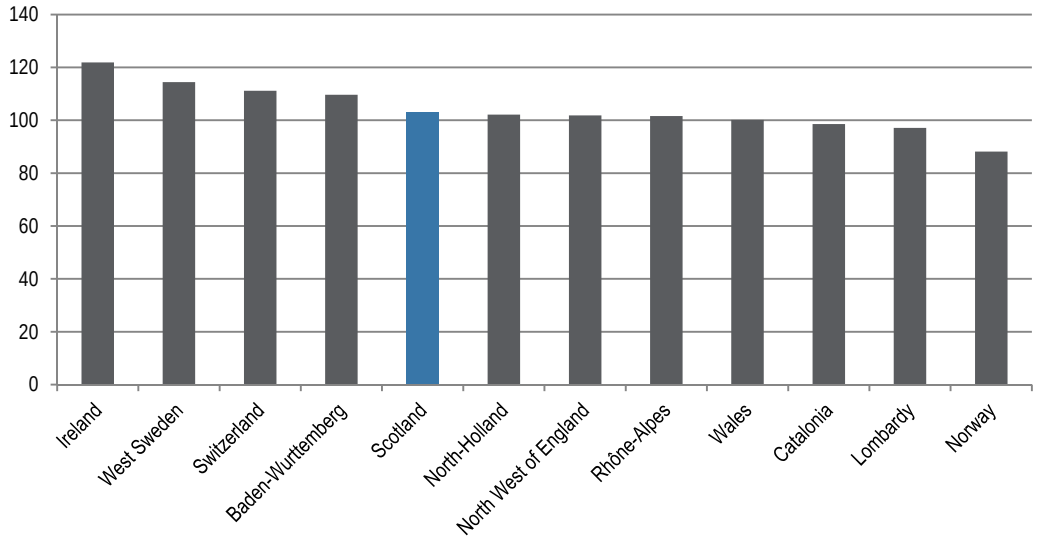
group of cities: Aarhus, Amsterdam, Auckland, Bucharest, Copenhagen, Dusseldorf, Manchester, Sofia, Vienna, Zurich
average of city sample = 100
Source: BAKBASEL

5. Assessing the economic and political structural potential of Scotland

The Performance Index and the Attractiveness Index cover current conditions and recent achievements of regional economic development. This is supplemented in this section by an analysis of a region's future prospects. This third index of the IB Index Family, the Structural Potential Index, indicates the future growth potential of a region inherent in its current economic and political structures.

The Structural Potential Index is itself divided into three components: Industry Structure Potential, Capacity to Compete, and Political Structure Potential. The Industry Structure Potential focuses on the regional industry structure and its inherent potential for further growth. A regional concentration in industries with bright prospects for expansion gives a region greater potential for substantial and sustainable growth and vice versa. The Capacity to Compete gauges the competitiveness of the region by summarising productivity indicators for all the export orientated industries. The Political Structure Potential covers the influence of the political structural conditions on overall growth prospects. The share of the informal economy, perceived corruption and the decentralisation of political decisions are the indicators applied here. The weighting of the indices is stated in the appendix.

Figure 8: BAKBASEL Structural Potential Index



Western Europe = 100; 2011

Source: BAKBASEL

Scotland scores well in the Structural Potential Index (Figure 8). This result is due to its considerable competitiveness. In contrast, the potential of its industry structure is below average. A remarkable number of important industries in Scotland (in terms of industry share in total economy) show on average rather slow growth prospects. Apart from financial and business services industries, none of the important industries of Scotland are included in the prospective top growth industries. The rest of the future top growth industries are rather small in Scotland.

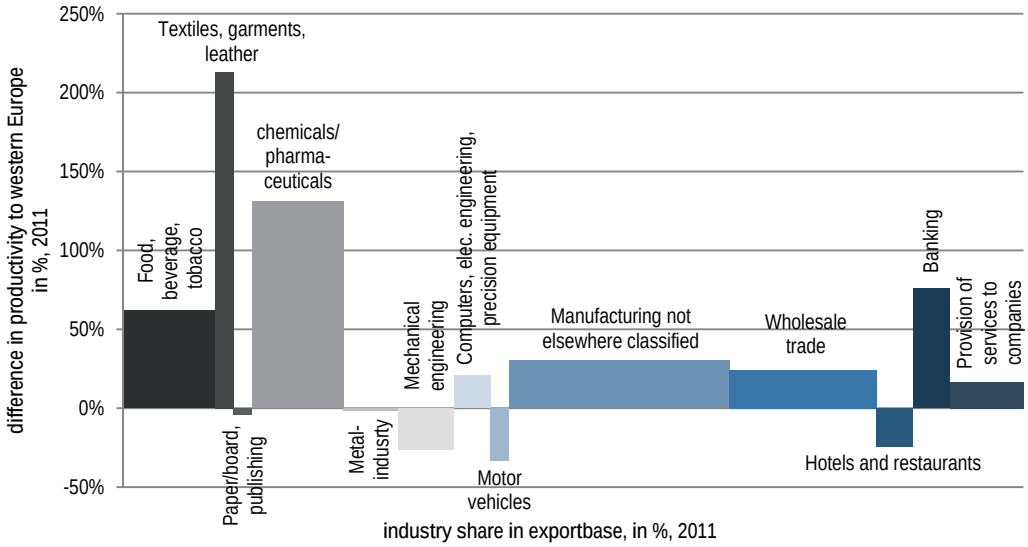
The Capacity to Compete Index concentrates on the competitiveness of the industries in the region. The Industry Structure Potential Index focuses on the regional industry structure and the potential for further growth inherent in it. In this part of the Index, the focus lies on the competitiveness of the industries in the region compared to the same industries elsewhere. If the industries present in the region are more competitive than their competitors elsewhere, the region is more competitive as well. The Capacity to Compete looks exclusively at the competitiveness of the export orientated industries. These industries are fundamental to the economic success of a region as they allow the region to participate in the global division of labour and profit from the advantages of a global economy. At the same time, these industries are much more vulnerable to sudden changes in international and interregional demand.

The main determinant of the competitiveness of the export industries is their productivity. In the long run, a more productive industry in one region should be able to gain market shares in the globalised economy and grow stronger than a similar, but less productive industry in another region.[7]

As noted above, Scotland's economy has increased its productivity over the last decade and is today highly productive.

[7] *On the level of the whole economy, productivity is highly biased due to, for example, different capital intensities. Within a chosen industry, this is much less of a problem. Productivity is an increasingly suitable measure for competitiveness the more similar the production conditions are. The IBD offers very detailed industry data on a regional level (45 industries) which is applied here.*

Figure 9: BAKBASEL Capacity to Compete Index: Scotland



industry share in nominal GVA of total economy; nominal productivity

Source: BAKBASEL

As can be seen from Figure 9, in Scotland a considerable productivity advantage is found in the following industrial sectors: “chemicals and pharmaceuticals”, “food, beverages and tobacco” and “other manufacturing”. Although the textiles and garment industry’s share of the total economy of Scotland amounts to just 2.0 percent, its contribution to the productivity advantage of Scotland’s economy is remarkable. Because the industry in Scotland is more than three times as productive as the Western European average, it contributes about 4 percent to Scotland’s productivity advantage. This is the same amount that the much larger banking or wholesale trade industries contribute.

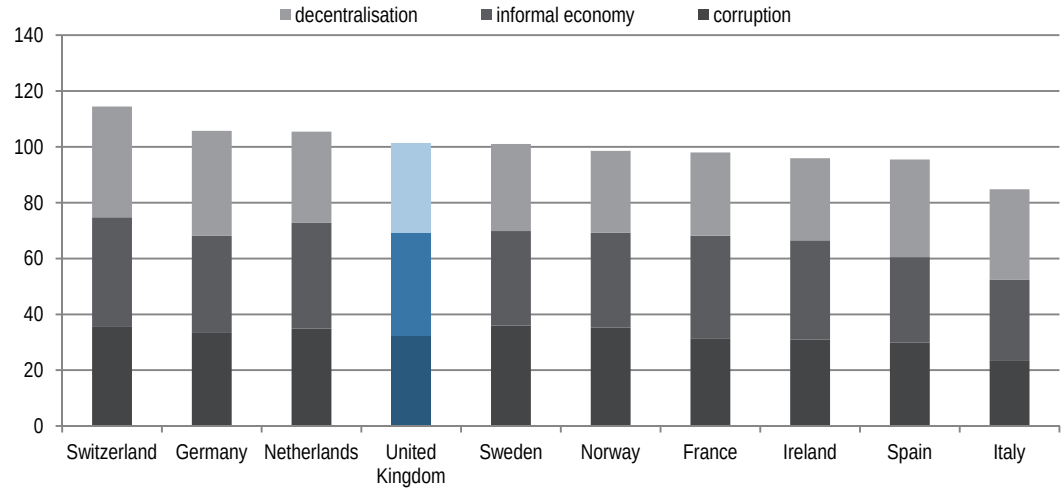
In Scotland’s service sector, every sub-sector, save the hotels and restaurants, shows higher productivity than the Western European average.

Hence, Scotland’s economy can be seen to be composed mainly of industries that, in general, do not promise the brightest prospects. However, even in industries with low or negative growth prospects (e.g. textiles industry), Scotland is more productive than the Western European average. It might well be that, because of regional specialisation, these industries will continue to grow in Scotland, whereas they will remain static or even shrink in other regions.

Not only does the economic structure shape a region’s future potential for development but so does its regulatory and political framework. The Political Structure Index summarises three economically important aspects of the framework: the size of the informal economy, perceived corruption and the index of decentralisation. This index measures a region’s freedom to act. Greater decentralisation provides regions with more room to organise their own future development opportunities. Corruption, on the other hand, undermines regional policies. Therefore, it is measured negatively in the index (the more corruption in a region, the fewer points earned in this category). The size of the informal economy is also integrated negatively in the index. A large informal economy implies there are problems in the

enforcement of regulations and/or there are excessive taxes, dues and regulations. The three indices are equally weighted in the Political Structure Index.

Figure 10: BAKBASEL Political Structure Index 2012



Western Europe = 100; 2012

Source: BAKBASEL

The United Kingdom is awarded just slightly more points in the Political Structure Index than Western Europe (Figure 10). On the positive side, the informal economy is considerably smaller in the United Kingdom than on average in Western Europe. Additionally, the Index for corruption shows fairly low corruption in the UK and is in line with the results in the recent EU anti-corruption report (European Commission 2014). On the negative side, decentralisation in the UK is less than average.

6. Conclusion

Scotland's economy performed quite well over the last decade. Compared to the top regions in the benchmarking sample, it still shows a slight deficit in GDP per capita, but when concentrating on the structural development over a period of ten years it is on a fast growing track and about to catch up with the leaders. A large advantage Scotland has is its strong gains in productivity. Productivity and productivity growth are two major aspects determining the competitiveness of a region. The above average productivity growth in Scotland provides a bright outlook for its future competitiveness.

While political independence can boost productivity and GDP per capita growth only indirectly, the small independent countries in the benchmarking sample are among the best performers in the EU. Nevertheless, one cannot conclude from this that independence *per se* would necessarily increase economic performance. For example, non-independent regions such as North Holland or West Sweden follow close on the heels of the Index leaders.

Scotland is an attractive region. Its attractiveness is near or above the Western European average in most areas. However, to attract and to hold on to foreign capital and highly qualified people, its level of attractiveness should be well above the Western European average.

Would an independent Scotland be more attractive to investors and people? How could an independent Scotland improve its attractiveness? In which areas is there room to manoeuver?

Scotland clearly profits from advantageous UK regulations. Scotland, as part of the UK, enjoys a favourable regulatory environment. Product and labour markets are very flexible. If Scotland became independent of the UK, it should strive to preserve this advantage.

The political structural potential of Scotland is good. Scotland currently benefits from the favourable conditions in the UK. Political independence could potentially strengthen this potential even more. Especially in the area of decentralisation, there is room for improvement.

While still below average, Scotland's tax burden on companies is moderate. The taxation of highly skilled people is, however, higher than in many European locations. Many countries and regions have lowered their tax burdens in the past and now outperform the UK. In the case of independence, Scotland´s ability to adjust taxation would increase. Nevertheless, it is questionable whether lower taxes would increase the attractiveness of Scotland sufficiently to compensate for lower tax revenues.

Any improvement in the accessibility of Scotland would be good. However, the restrictions of its geographical position are hardly possible to change. With respect to its connection with the world, Scotland profits from its reliable connections to the international hub of London. Here, an independent Scotland should aim to ensure that it retains its good accessibility to Heathrow as Europe's largest global hub.

The framework conditions for innovation are good in Scotland. Scotland's productivity gains may reflect these positive conditions. Scotland has high-quality universities and researchers and its innovation capacity is high, but its number of patents is low. A more effective use of the available knowledge resources should be encouraged. For innovation, interaction and exchange between people and academia and industry matters. With regard to any future constitutional change, this should be an important focus for Scottish public policy.

In summary, Scotland's future economic prospect is driven by two opposing forces. First, in Scotland's economy, industries with mediocre prospects play important roles. Only two industries that are generally considered to be high-growth industries make up a considerable share of the economy of Scotland [financial and business services and the chemical (including pharmaceutical) industry]. Second, nearly all industries in Scotland show higher productivity than the Western European average. Scotland's economy possesses an advantage in its competitiveness. It might well be that some industries will prosper in Scotland while they retreat in Western Europe. This regional specialisation would perhaps become more pronounced and supported were Scotland to be independent.

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Appendix: Methodology

Normalisation of the indices:

All three indices of the IB Index Family as well as all sub-indices used are normalised with identical methods. For each variable used in the calculation – which could be an indicator from the IBD or an index already calculated in an earlier step – the average value of the indicator across all NUTS2 regions in Western Europe is calculated.[8] This average is set identical to 100. In the next step, standard deviation of the variable across the same set of European NUTS2 regions is calculated. This is set to 10. Therefore, an index value of 110 means the region is, with respect to the variable in question, one standard deviation better than the average of the European NUTS2 regions; an index of 80 means it is two standard deviations below the average. [9]

When summing up the individual sub-indices, the weights given in the definition (see below) are used and the calculation of standard deviation is repeated. Therefore, the three indices of the IB Index Family have an average of 100 and a standard deviation of 10 Points for the set of Western European NUTS2 regions as well. Note that for some indicators, e.g. taxation, the inverse is used in calculating the corresponding index as lower values actually reflect higher attractiveness.

Components of the Performance Index

- GDP per capita (last available year, PPP): Weight 50%
- GDP growth (last ten years average, at constant prices, PPP): Weight 25%
- Employment growth (last ten years average): Weight 25%

Components of the Attractiveness Index

- Taxation (30%):
    - Tax burden on highly qualified employees (effective average tax rate; single person, disposable income € 100'000): Weight 10 %, negatively included in the index
    - Tax burden on companies (effective average tax rate (EATR) on a profitable investment): Weight 20%, negatively included in the index
- Accessibility (20%)
    - Global accessibility (outbound accessibility to destinations other than Europe, destinations GDP-weighted): Weight 10%
    - Continental accessibility (outbound accessibility to destinations within Europe, destinations GDP-weighted): Weight 10%
- Regulation (20%)
    - Regulation of labour markets (OECD index): Weight 10%, negatively included in the index
    - Regulation of product markets (OECD index): Weight 10%, negatively included in the index
    - Innovation (30%)

[8] There are about 200 NUTS2 regions in the "old" EU15 plus Norway and Switzerland. Offshore territories (e.g. in Africa, Caribbean) are excluded.
[9] Note that this methodology is identical to the calculation of the IQ.

- Research quality of universities ("Shanghai Index of University Quality"): Weight 10%
- Patents (patents per inhabitant): Weight 10%
- Publications (publications per inhabitant): Weight 10%

The weighting used to aggregate the indicators into the overall Attractiveness Index is derived from a growth estimation. They reflect the (rounded) coefficients of the involved locations factors obtained from an estimation of GDP growth across the regions covered in the International Benchmarking Database.

Components of the Structural Potential Index

- Industry Structure Potential: Weight 40%
  Industry Structural Potential is calculated using the expected average growth of all industries in highly developed and industrialized countries like Western Europe or North America for the period 2012 to 2020. These expectations are derived from a meta-analysis from various sources and forecasts (Oxford Economics, Prognos, BAKBASEL). They are combined with the region specific industry shares. The derived structurally expected growth in the regions is then used to calculate a sub-index.

- Capacity to Compete: Weight 40%
  The Capacity to Compete draws on the differences in hourly productivity, setting the export orientated industries' productivity in relation to the productivity average of corresponding industries in Western Europe. All manufacturing industries are considered as export orientated industries as well as a number of service industries (predominantly wholesale trade, tourism, finance and business services). Note that the index takes the weight of the individual export orientated industries into account, but it does not include the weight of the export orientated industries within the regional economy.

- Political Structure Potential: Weight 20%
  - Size of the informal economy (P. Feld / F. Schneider, 2010): Weight 6.7%
  - Perceived corruption (Corruption Perceptions Index (CPI), Transparency International)[10]: Weight 6.7%
  - Decentralisation (Decentralisation Index, BAKBASEL, 2009)[11]: Weight 6.7%

As before, choosing the weighting for the individual components of the Structural Potential Index is not based on clear theoretical or empirical guidelines. The Industry Structure Potential and the Capacity to Compete are weighted identically with 40 percent. The Political Structure Potential is considered to have a less direct effect on the economic potential. Therefore, it is weighted with 20 percent in the Structural Potential Index; its individual indicators are given identical weights.

[10] For more information on the CPI consult http://www.transparency.org/policy_research/surveys_indices/cpi
[11] For more information on the Decentralisation Index consult "Decentralisation Indicators on the Regional Level" on http://bakbasel.ch/wEnglisch/competences/governance_projects/index_governance