

Final draft

Nordic Globalization Barometer 2009

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Executive Summary

Less than a year after the first Nordic Globalization Barometer has been launched, the state of the world economy has changed dramatically. A deep financial crisis is taking its toll on investors, borrowers, and the financial institutions that serve them. A deep economic crisis is threatening to bring the global economy close to stagnation for the first time in the modern era. And while some past economic downturns and financial collapses did have an international dimension, this one is arguably the first true global crisis, affecting pretty much all economies around the globe. This raises many long-term questions about globalization, about the functioning of markets, and about the lessons the Nordic countries should draw from this crisis. And with the crisis still unfolding, there are also many short-term questions about what should be done right now to contain the downturn.

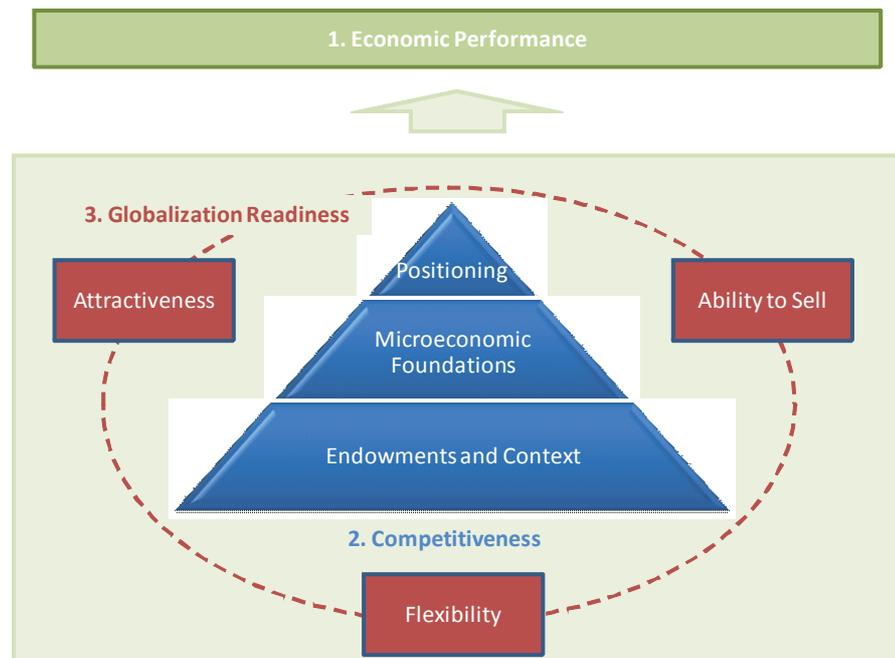
The Nordic Globalization Barometer makes a contribution to those questions that are related to the supply side of the economy, i.e. the factors that influence an economy's productive capacity in the medium term. Much of the current policy focus is instead on short term efforts to shore up the financial system and make up for the downfall in aggregate demand. The challenge is to make such short-term policy choices in a way that addresses these immediate challenges while being consistent with rising levels of global competitiveness and productive capacity over time. The Barometer provides data to inform the decisions that Nordic leaders are facing in this respect.

The Global Competitiveness of the Nordic countries

The framework for measuring the global competitiveness of the Nordic countries introduced in last year's Nordic Globalization Barometer is also this year used to organize the discussion. The data signals broad stability in the Nordic region's overall competitiveness and globalization readiness as well as, until the last quarter of 2008, in its economic outcomes. There is no data about changes in competitiveness or globalization readiness since then and these indicators tend to change only slowly over time anyway. For economic outcomes, however, the data shows a clear deterioration since the full scale outbreak of the crisis.

Already before the crisis hit in late 2008, prosperity growth in the Nordic region started to slow down. This was a clear sign that the region was approaching the top of the business cycle just as the financial crisis was unfolding. Labor productivity growth decelerated; a normal feature late in the cycle. Labor utilization continued to grow but also here rates were starting to come down as Nordic economies were increasingly hitting capacity constraints. Despite these bottlenecks, the Nordic countries were able to marginally reduce its disadvantages in terms of high domestic prices compared to the European average. This continues the trend of

slow price convergence that has been present for the last few years. Overall, the year-to-year changes in economic outcomes are fully consistent with the Nordic' countries business cycle position and signal no structural changes compared to previous years.



The high level of current prosperity across the Nordic countries continues to be well explained by their competitiveness. The Nordic region ranks among the global top ten on macroeconomic as well as microeconomic competitiveness. Individual countries deviate from this pattern in some dimensions; both Iceland and Norway, for example, rank lower on microeconomic competitiveness. But the overall pattern is stable, with very small changes relative to last year. On macroeconomic competitiveness, the strong level of social infrastructure and political institutions has long been a hallmark of the Nordic countries. Solid macroeconomic policy has more recently also become a standard in the region, even though Iceland already showed signs of strain before the crisis hit in the fall of 2008. On microeconomic competitiveness, the region continues to be strong on most factor input conditions, on the quality of demand, the equal access and formally openness of markets, and the sophistication of companies. Challenges remain in some parts of education, the incentives for entrepreneurship and competition, and the actual level of rivalry on domestic markets.

Globalization readiness continues to be high overall for the Nordic countries; not a surprise for small open economies fully integrated in the global economy. The Nordic countries' position abroad as an exporter and investor remains strong, with exports developing less dynamically than foreign investments. The ability of the Nordic countries to attract further investment seems to be suffering, although the presence of foreign

investors already in the region remains high. Measures of actual flexibility for the Nordic region tend to be high, while the picture on the relevant rules and regulations is mixed.

Overall, the Nordic region registers a **high level of global competitiveness**. But many of the more long-term concerns about its position raised in last year's Barometer remain firmly in place: The Nordic countries need to sustain their solid level of **workforce skills, infrastructure, and capital availability** to manage the pressure from emerging countries, even when their catch-up might be temporarily halted by the global crisis. The eroding performance on **science skills and patenting**, two traditional strengths of the Nordic countries, remains a concern. Taxation and other barriers continue to affect **entrepreneurship**, an increasingly important factor in a knowledge-intensive economy. Deeper **Nordic market integration** remains on the agenda as a tool to battle high prices, low levels of rivalry, and the limited entry of foreign companies and new domestic businesses. Finally, the Nordic countries continue to face the challenge of how to manage the shift from exporting goods to exporting knowledge in a way that sustains or even grows prosperity at home.

Energy and the Environment in the Nordic countries

Energy and the environment have become increasingly important topics in the global competitiveness debate. Apart from their obvious value in their own right, these areas could for the Nordic region be a way to clearly position itself in international competition as a global leader in this specific field.

The current data underlines that the Nordic countries have a strong opportunity to develop a global leadership position in the field of energy and environment. Energy supply is overall stable and the Nordic countries have already made significant strides in using renewable sources of energy production. Environmental conditions are healthy. Significant knowledge on energy and environmental technologies exists in Nordic research institutions and companies. And Nordic energy and environmental research is strongly engaged in international research activities. Eco industries play already a significant role in the Nordic economies, higher than in the economies of many EU peers. Individual clusters and companies have been able to achieve leading global positions in their respective fields of the energy and environment industry.

Despite these solid foundations, there are also challenges ahead. The strong position of the Nordic countries on renewable energy is to a large degree the result of the natural energy sources available. With the naturally given capacity largely exploited, **future energy needs** will have to be met through technological advances or a shift towards new fields. And despite the significant use of renewable energy, there remains still enough to do for the Nordic countries to reach the Kyoto-protocol targets. The policy differences on a number of important policy issues, from the use of nuclear energy to the subsidies for biofuels, do not help. More **alignment of regulations** would enable the creation of a more integrated Nordic market for energy and environmental products, with benefits for competition and innovation. The Nordic position in knowledge production in the

field of energy and environment is good but not outstanding. There are **few institutes with global visibility**, but a relatively high number of smaller universities and other research institutes. This could be a disadvantage as large international research institutions focus more on this field. Individual clusters and companies from the Nordic region have a strong position in the energy and environmental market. But **market size** could again be an issue: As investors in the US and large continental European countries shift more forcefully towards this market, individual Nordic countries will face a hard time to sustain their global visibility as market leaders.

The Financial Crisis and Nordic Global Competitiveness

The global financial and increasingly also economic crisis is challenging many views about the global market economy. For the Nordic countries, it raises the question of how they might need to revise their efforts to prepare for higher levels of global competitiveness.

The current financial crisis has its origins in a number of interrelated policy choices and changes in the economic context over the last ten to fifteen years. Together they provided a fertile ground for the natural tendencies of financial markets to develop bubbles in reaction to changing external conditions. As the broader environment changed, the financial services industry transformed from an asset-driven business around the interest rate spread between deposits and credit to a transaction-driven business around trading and fees. In the process, banks' balance sheets, trading volumes, and also bank executives' compensation levels skyrocketed as financial institutions used increasingly leveraged instruments. When the US started to enter the later stages of a long business cycle in late 2005, the normal dynamics of a financial crisis started to set in. But this time, the nature of the new financial instruments introduced in the last decade turned a normal default problem into a large scale trust problem. The uncertainty about who was exposed to what risks, especially after the Lehman bankruptcy in September 2008, brought the entire financial system to the brink of collapse. In the aftermath of this dramatic culmination of events, financial markets entered a protracted phase of deleveraging and reassessment of risk that continues today. The shock waves were then quickly transmitted to financial markets outside the US, the real economy in the US, and ultimately economies across the globe.

The Nordic countries had relatively little direct exposure to the US financial markets that were the epicenter of the crisis. But as the crisis infected wider segments of the financial services industry, Nordic equity and capital markets suffered as well. The impact reached a new level as the crisis got a truly global dimension. As small open economies with independent currencies (with the exception of Finland) both the downturn in global demand and the flight to the safety of large currency areas hit the Nordic region. Iceland was a dramatic victim: Much of its banking industry had put full trust into the new financial market structures with seemingly unlimited liquidity. As the financial crisis hit, the Icelandic banks were stuck not only without refinancing opportunities but also without a Central Bank or Treasury large enough to cover their exposure.

The costs to the Icelandic people were exacerbated by the aggressive lending on the domestic market in foreign currency in the recent past that now led to the default of many Icelandic consumers.

The crisis raises many fundamental questions about globalization and competitiveness, and about the course that the Nordic countries should now choose. Globalization and the focus on competitiveness upgrading are not responsible for the current crisis. But the policies that allowed them to prosper were at least not inconsistent with the unsustainable growth in the financial system. This will need to be taken into account when designing a more robust global economic structure for the future. In the short term, however, globalization and competitiveness need to be guiding principles for the crisis management. Sacrificing them would make a recovery only less likely and much slower. For the Nordic countries, the crisis underlines the need to sustain a high level of economic flexibility. Small open economies can benefit tremendously from integrating in the global economy, but they also need to have the systemic ability to deal with the exposure to global shocks that this enables. More fundamentally, the Nordic countries need to have a serious debate about the costs and benefits of independent currency regimes and, primarily for Iceland, of staying outside the European Union. If crisis in the new global environment can become too powerful, the shelter of a larger economic region might have additional benefits.

Recommendations

Competitiveness fundamentals are likely to become even more important when the current crisis has dissolved. The Nordic region needs to retain its **key strengths**, especially on skills and research. These are areas in which Nordic collaboration could help, for example by moving further towards an integration Nordic innovation area. The Nordic region also needs not address some of its entrenched **weaknesses**, especially its low level of entrepreneurship and the low intensity of domestic rivalry. These are areas in which Nordic collaboration can at least make a meaningful contribution, for example by forceful market integration that opens up new opportunities for entrants and rivals. There are also signs that the **Nordic model** to be further developed: High flexibility is an increasingly beneficial quality but the Nordic countries will need to review whether the mechanisms in play continue to fulfill this ambition. Domestic capabilities can be leveraged in many new ways in the global economy, and the Nordic countries will need to review whether the current policies are sufficient to enable the region to benefit

In **energy and environment**, the Nordic region is facing a significant opportunity to position itself as a global leader in an area of large future growth, but has to take active steps to keep ahead of rising competition. The policy differences on a number of important policy issues, from the use of nuclear energy to the subsidies for biofuels, create confusion and limit the opportunities for new technologies in the region. More **alignment of regulations** would enable the creation of a more integrated Nordic market for energy and environmental products, with benefits for competition and innovation. The Nordic position in knowledge production in

the field of energy and environment is good but not outstanding. There are **few institutes with global visibility**, but a relatively high number of smaller universities and other research institutes. An integrated Nordic innovation area would create a valuable counterforce. Issues of energy-efficiency and environmental sustainability are cutting across **many sectors of the economy**. The policy approach needs to broaden its perspective in this way and work with companies, maybe in cluster-specific platforms, on environmental strategies for important sectors.

In the **response to the financial crisis**, the Nordic countries need to balance the short term requirements of averting a deep recession with the long-term needs of upgrading competitiveness. In the short term, the most important task is to **avoid undermining future competitiveness**. Sustaining openness to global competition is crucial; this might be easier to see in the small open Nordic economies than in some of the larger OECD countries. Government spending to replace missing demand should at least in parts focus on investments that lead to competitiveness upgrading. In the next stage, **efforts to avert a repetition of the crisis** will be on the agenda. Better coordination in regulating financial markets is an obvious task but will require collaboration beyond the Nordic countries. At the regional level, **joint surveillance of risks** (housing market, current account, sectoral exposure, currency) and **ex-ante preparations for crisis management** could be helpful. Finally, the Nordic countries will have to discuss whether the changes in the global economy suggest more fundamental changes in their economic policy architecture. The balance of costs and benefits from operating an independent **currency** and staying outside the **European Union** might have shifted. While both economically and politically complex, the question of membership in the Eurozone/EU should be discussed anew given the range of experiences in the Nordic region. Whether these are the right answers remains to be seen. Not to be asking the questions would be foolish given recent events.

1. Introduction

The 2009 Nordic Globalization Barometer is the second in its series. Launched last year in Riskgränsen (Sweden), the Barometer is presented at the request of the five Nordic Primer Ministers. At their June 2007 meeting in Punkaharju (Finland), they had launched a common Nordic initiative to further prepare the region for the opportunities and challenges of globalization. Within this initiative, the Nordic Globalization Barometer provides a framework to structure the debate on globalization, collects relevant data on the position of the Nordic countries relative to its global peers, and identifies policy issues that are critical to address at the regional level. The 2008 edition of the Barometer is launched as part of the 2nd Nordic Globalization Summit in Iceland.

Less than a year after the first Nordic Globalization Barometer has been launched, the state of the world economy has changed dramatically. A deep financial crisis is taking its toll on investors, borrowers, and the financial institutions that serve them. A deep economic crisis is threatening to reduce global GDP growth to less than 1%, its lowest level in modern times (IMF, 2009a). While some past economic downturns and financial collapses did have an international dimension, this one is arguably the first true global crisis, affecting essentially all economies around the globe. This raises many longer-term questions about globalization, about the functioning of markets, and, of course, about what lessons the Nordic countries should draw from this event. And with the crisis still unfolding, there are also many short-term questions about what should be done now.

The Nordic Globalization Barometer makes a contribution to a specific subset of these questions. Its focus is on what economists call the '*supply side*' of the economy, i.e. the factors that influence an economy's productive capacity. The productive capacity is important, because it ultimately determines the standard of living that the citizens of the Nordic countries will be able to sustain in the medium-term future in global competition. Much of the current crisis, specifically the real economy downturn that has started to materialize, is instead relate to problems on the '*demand side*' of the economy, i.e. the factors that determine how much of a country's productive capacity will actually be used to serve customers willing to pay for products and services. While these two areas require a different type of analysis and policy response, they are not completely unrelated. A long term slump in demand can erode supply, for example by depressing investments and eroding the capabilities of employees that lose their skills during unemployment. Efforts to jump-start demand can contribute to improvements in supply conditions, for example when investments are made that strengthen the capital stock of the economy. The Nordic Globalization Barometer deals with the current crisis in those dimensions that are related to supply-side policy choices.

The Nordic Globalization Barometer 2009 is structured in three parts: Chapter 2 looks at the global competitiveness of the Nordic countries. Following up on last year's Barometer, the chapter provides an assessment of how the global competitiveness of the Nordic countries has

changed over the course of the last year. It looks at three separate dimensions:

- First, the chapter tracks the changes in economic performance, the ultimate way in which competitiveness materializes into prosperity. The indicators closely match those that were covered last year. Short term changes of economic performance indicators are highly driven by changes in demand. But their overall level provides important insights into the underlying fundamentals of an economy.
- Second, the chapter covers the main aspects of competitiveness. Using refinements that are being introduced in the methodology of the Global Competitiveness Report, changes in the broad set of categories introduced last year are covered. In the short term, a country's position on such fundamentals does not tend to change very much. But the current dynamics can give valuable information about the direction in which an economy is moving.
- Third, the chapter covers the specific elements that are important for a country to project its competitiveness in the context of the global economy. The broad categories to measure what is called here 'globalization readiness' follow closely those that were introduced last year. Some of the indicators, particularly in- and outward FDI flows, fluctuate significantly from year to year while others, like measures of market flexibility, tend to be more stable over time. Both are important to assess how a country is being affected by shocks in the global economy.

Chapter 3, drafted by Johanna Roto, Patrick Galera-Lindblom, and José Sterling from Nordregio, Stockholm, takes a more specific view at the position of the Nordic countries in the field of environment and energy. This topic is related to the global competitiveness of the Nordic countries but it also has an independent, direct effect on the standard of living people in the Nordic countries will be able to enjoy in the future. A healthy environment and stable energy supplies are an essential part of a high quality of life. In terms of competitiveness, environment and energy could be one the areas that define the Nordic region's unique positioning the global economy. The chapter is organized in three sections:

- First, the chapter summarizes the actual outcomes and selected policies in the environmental and energy area. This provides the background for how these areas currently affect the standard of living in the Nordic countries. And it characterizes the context in which competitive advantages in these areas might be emerging.
- Second, the chapter looks at the knowledge and capabilities on environmental and energy issues available in the Nordic region. This provides a sense of the potential for economic benefits that the region could derive from its position in this area.
- Third, the chapter provides a view on the contribution that companies working with environmental issues and energy currently make on the economic performance of the Nordic countries.

Chapter 4 of the Barometer then discusses the global financial and economic crisis. The aim of this discussion is to better understand the relationship between the current crisis and global competitiveness and start to identify emerging policy implications. With the crisis and the understanding of its dynamics still developing, it is unrealistic to expect any ultimate conclusions to emerge. The intention is instead to provide an overview of recent events in structure that enables the debate to focus on some key policy questions ahead. Given the nature of the Barometer, the discussion concentrates on medium-term decisions that leaders in the Nordic countries will face once the immediate crisis is starting to peter out. Questions on the size or timing of stimulus packages or the specific approach to address the systemic challenges in the financial system are largely beyond the scope of the Barometer. The chapter is organized in three sections:

- First, the chapter provides an anatomy of the current crisis, from its antecedents in the economic and regulatory environment during the last decade and the transformation of the financial services industry during this period to the outbreak of the financial crisis and then the severe economic downturn that it triggered. The aim is to disentangle some of the main dynamics and drivers of the crisis, especially to understand the role that globalization played in this process.
- Second, the chapter gives an overview on how the global crisis has in its different permutations affected the Nordic countries. It provides some background on the situation the Nordic countries were in before the crisis, follows the ways in which the crisis has started to affect the region, and then discusses some of the factors that will be important for the direction events will take in the near future.
- Third, the chapter discusses a number of emerging lessons. Some of them are general, dealing with the broader view of globalization and how countries should prepare for it. Others are more specific to the Nordic region, identifying action priorities that are a consequence of the position the Nordic countries as small open economies with (with the exception of Finland) independent currencies.

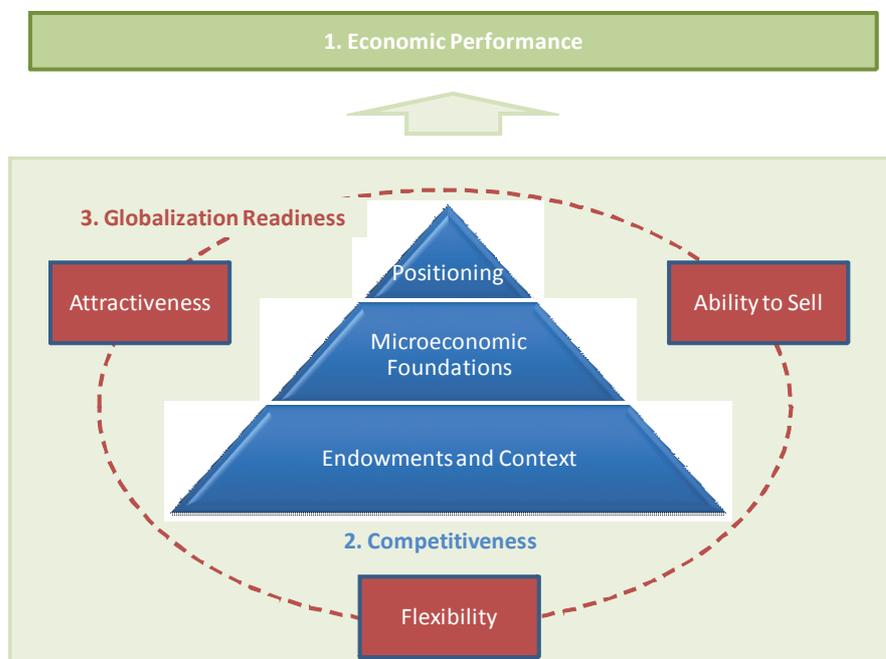
The Barometer concludes with a number of summary remarks on the main findings and policy conclusions.

2. Global Competitiveness of the Nordic countries

Competitiveness in the global economy remains a concept marred by significant differences in the way it is used. For the purpose of the Barometer, competitiveness is defined as the ability of economies to earn high levels of prosperity on global markets based on the productive environment they provide for companies. This definition is most appropriate when the factors supporting high levels of prosperity are of interest.

Last year's Nordic Globalization Barometer introduced a framework for measuring the global competitiveness of the Nordic countries. This year's Barometer continues to follow this framework but adjusts some of the individual indicators used depending on data availability. The position of the Nordic countries in the global economy is evaluated in three main categories:

- **Economic performance**, in particular a high standard of living, is the ultimate objective of economic policy. The Barometer tracks overall measures of prosperity and prosperity generation, including GDP per capita, labor productivity, labor mobilization, and local price levels.
- **Competitiveness** is the combination of factors that set the level of productivity that companies can reach in a given location, the key long-term determinant of the standard of living a location can sustain. Based on the refined framework introduced in the new Global Competitiveness Index (Porter et al., 2008), the Barometer differentiates between macroeconomic and microeconomic competitiveness.
 - Under macroeconomic competitiveness, the quality of social and public institutions as well as of macroeconomic policies is discussed. This category corresponds to 'context' in last year's Barometer but excludes 'endowments'. Endowments, like natural resource assets or features of geographical location, are excluded because while they affect prosperity they cannot be changed by policy.
 - Under microeconomic competitiveness, the focus is on different dimensions of business environment quality and company sophistication. This category corresponds directly to 'microeconomic foundations' in last year's Barometer. Positioning, the third element used last year to complete the 'competitiveness pyramid', is not discussed in detail this year. A focus on environmental quality, one dimension that had been suggested was special to the Nordic region in last year's Barometer, will this year be treated in detail in chapter two. Other dimensions of similar unique importance for the Nordic region might be taken up in future years.



- **Globalization readiness** describes the ability of a location to successfully engage with the global economy, bringing to bear its full competitiveness. The Barometer tracks three categories of relevant indicators: First, the ability to sell goods, services, and ideas on the global markets. These indicators show whether a country can leverage its capabilities and turn it into prosperity from selling abroad. Second, the attractiveness for global capital, companies, ideas, and people. These indicators show whether a location is a magnet for others that then contribute to value generation locally. Third, the flexibility to manage structural change and react to external shocks. These indicators show whether a location is able to re-allocate resources as global demands change and the exposure to external shocks increase with the density of linkages to other countries and regions.

As in the previous year, the Nordic Globalization Barometer aims to strike a balance between accessibility, i.e. being sufficiently brief to enable decision makers to use the data, and relevance, i.e. providing sufficient breadth and depth to enable a meaningful discussion about actions. It draws on existing data and research rather than extensive primary analysis. The positions of the Nordic countries individually and on aggregate are summarized through the simple color scheme below (grey color is used if no data is available). The sources for the detailed data are provided and the data will be made available electronically but is not reproduced in the report.

Compared to last year's Barometer, there is a stronger focus on the most recent changes of the data. Wherever possible, there will be data on the level, on the change relative to last year, and on the dynamics of change, i.e. the change of growth rates. This is a deviation from last year, where the focus was more on medium term changes over the last five years.

Green for a position better than the OECD and EU-15 average, or a rank within the global top 10, or an improvement

Yellow for a position between the OECD and EU-15 average, a rank between 10 and 20 globally, or no change

Red for a position below the OECD and EU-15 average, a rank lower than 20 globally, or a deterioration

A particular challenge for this year's Barometer is the dramatic change from 2007 to 2008, in fact from the first half of 2008 to its last quarter, and the huge uncertainty of how economies are going to develop in 2009. The Barometer aims to use the best sources of data that have the necessary coverage in terms of countries. For many of these sources, especially those covering indicators of underlying macroeconomic and microeconomic competitiveness, the latest available data covers 2007. While this is a clear drawback given how much the economic climate has changed, many of these fundamentals affecting the supply side of the economy change much less and therefore remain important data to analyze. For measures of economic outcomes, however, we have tried to use the updated data for 2008 as far as possible.

2.1 Economic Performance

Integration in the global economy is not an objective per se. It is only relevant because it enables higher standards of living than would be possible in a closed economy. This is why the ultimate test of the ability of a country to succeed in the global economy is the standard of living its citizens can enjoy. The most important indicator to measure **prosperity** is the average GDP per capita, adjusted by local price differences, the so-called purchasing power parity (PPP). Labor productivity and labor mobilization determine together with local price levels prosperity in an accounting sense.

Prosperity			
	Level	Growth	Growth Dynamism
Nordic	Green	Green	Red
Denmark	Green	Red	Yellow
Finland	Green	Green	Red
Iceland	Green	Yellow	Red
Norway	Green	Green	Green
Sweden	Green	Yellow	Red

Prosperity is measured by GDP per capita, adjusted for purchasing power parity; level data is for 2008, growth is relative to 2007, and growth dynamism is the change of the annual growth rate from 2007 to 2008. Coloring is relative to OECD/EU. Source: The Conference Board, 2009

The Nordic countries continue to register a strong position on GDP per capita (PPP), a measure that captures the longer term fundamentals of an economic and does not change rapidly over time. The region overall and each individual Nordic country register higher levels of average prosperity than the OECD and the EU-15. The short term view on 2008 growth and the change of growth rates between 2008 and 2007, measures of the short term dynamics that are more a reflection of short-term shocks and business cycle changes, is considerably less benign. On the back of strong Norwegian and solid Finnish prosperity growth in 2008, the Nordic region still outperformed the OECD and EU-15 overall. But Iceland and Sweden already dropped below the OECD benchmark on this measure, and Denmark lags even the EU-15 average. For all countries, Iceland in particular, the yearly growth rates also do not do justice to the dramatic deterioration in the last quarter. On the dynamics of prosperity growth, the picture is even bleaker. The Nordic region has seen its growth rate drop by more than its EU-15 and OECD peers. Only Norway registered a more moderate slowdown, while Denmark had already decelerated in 2007. The slowdown is clearly a worry but it is far too early to interpret it

as a sign of loosing underlying competitiveness. Equally consistent with the data – and more likely given the other evidence in this Barometer – it merely indicates the extent of the slowdown in small open economies fully integrated with global markets.

The Nordic countries continue to register solid **productivity** rates, measured by GDP (PPP adjusted) per hour worked. However, the high value for Norway – driven to a significant extent by the share of oil and gas revenues in the country’s GDP – drives this result as last year. All other Nordic countries register productivity levels below the EU-15, Iceland even below the OECD. Productivity growth in the Nordic region has been slightly negative in 2008, whereas the EU-15 registered the same level of productivity as in 2007. Already last year productivity growth in the Nordic region was quite low; then a consequence of the high increase in labor mobilization towards the later stages of the economic cycle. This is why the Nordic countries now registered a less pronounced slowdown in productivity than their OECD and EU-15 peers. The Nordic outlier is Finland, which registered very high productivity growth last year and still achieves positive productivity growth in 2008 despite a dramatic drop in the growth rate. As for prosperity, the short term data on productivity more likely an indication of the current economic climate than of underlying competitiveness. But the level data shows that the Nordic countries continue to have potential for improving productivity.

Labor Productivity			
	Level	Growth	Growth Dynamism
Nordic	Green	Red	Green
Denmark	Yellow	Red	Green
Finland	Yellow	Yellow	Red
Iceland	Red	Yellow	Green
Norway	Green	Red	Green
Sweden	Yellow	Red	Green

Labor productivity is measured by GDP per hour worked; level data is for 2008, growth is relative to 2007, and growth dynamism is the change of the annual growth rate from 2007 to 2008. Coloring is relative to OECD/EU. Source: The Conference Board, 2009

The Nordic countries position on **labor input**, here measured by hours worked per capita – a summary measures that captures the impact of demographics, unemployment rates, and working hours by employees - is favorable comparable to other advanced economies. It is at 820 hours significantly above the level in the EU-15 and has in 2008 even surpassed the OECD average. Only Norway continues to lag its Nordic peers somewhat, at about 800 hours per year. On average, eleven hours more work were registered per inhabitant of the Nordic countries in 2008 than in 2007. Only Denmark and Iceland had somewhat lower labor input growth below the EU-15 average: Denmark most likely because it was facing more serious bottlenecks at the end of the business cycle; Iceland

possibly because of the dramatic slow-down at the end of the year. In 2007, labor input across the Nordic region had grown even more, both relative to 2008 and to 2007 in the EU-15 and OECD countries. The slowdown in growth in 2008 was therefore more pronounced in the Nordic countries than elsewhere. Only in Finland, where the growth had not been very high last year, did labor input growth stay almost at 2007 levels.

Labor Input			
	Level	Growth	Growth Dynamism
Nordic	Green	Green	Red
Denmark	Green	Yellow	Red
Finland	Green	Green	Green
Iceland	Green	Yellow	Red
Norway	Yellow	Green	Red
Sweden	Green	Green	Red

Labor input is measured by annual hours worked per capita; level data is for 2008, growth for the relative change 2008 to 2007, and growth dynamism for the change in percentage change in 2008 to 2007. Coloring is relative to OECD/EU. Source: The Conference Board, 2009.

Three key factors have an impact on the level of labor input countries reach: Working hours per employee, unemployment among the working age population, and the share of people with working age in the total population. On **working hours per employee**, there is a wide range across the Nordic countries. Icelandic employees work the most, also more than their peers in the EU-15 and OECD. Iceland's position on working hours has not changed significantly over the last few years, but the clear drop in 2008 might suggest that the economic slowdown will at least partly result in lower working hours. Norway is on the other end of the spectrum, with working hours far below Nordic and global peers. The gap between Norway and its peers has, however, shrunk somewhat over the last few years. Sweden had the highest labor input growth of all Nordic and European countries in 2007 and remained on par with its leading peers in 2008, even though growth has come to a halt. A significant part of the difference in working hours per employee is driven by the higher share of part-time employment in the Nordic countries, especially among women (European Commission, 2008b).

On **employees per population** the Nordic countries have traditionally been ahead of their European and OECD peers. The gap increased in 2008, despite a significant slow-down in dynamism relative to 2007. Norway and Finland registered the strongest increase in the share of employees in the population in 2008. An important factor driving these changes is the unemployment rate. The Nordic countries have over the last few years had a lower unemployment rate than the OECD and the EU-15. This gap increased in 2007 as unemployed continued to drop. The 2008 data suggests a significant reduction in the fall of unemployment in the Nordic region, with quickly rising unemployment rates at the end of

the year. For the total of 2008 the track record on unemployment in the Nordic countries continued to outperform its EU and OECD peer but it is doubtful whether the same was true for the last quarter.

On the **demographic profile**, last year's Barometer discussed the position of the Nordic countries in more detail. While the Nordic countries face clear challenges from aging populations, their position is more beneficial than in many other advanced economies.

Domestic Price Levels		
	Level	Rel Change
Nordic		
Denmark		
Finland		
Iceland		
Norway		
Sweden		

Level is normalized price level of a set basket of goods and services relative to the EU-27 average in 2007; changes are changes in this relative price level between 2006 and 2007. Source: Eurostat, 2008.

The Nordic countries traditionally register relatively high **local cost levels**. A combination of high taxes, small domestic markets, high domestic purchasing power, and other factors results in high prices. In 2007, however, the Nordic region registered overall lower price increases than the EU. Partly this is a reflection of the high inflation in the new EU member countries (economists call this Balassa-Samuelson effect) but even relative to the EU-15 countries the Nordic region kept prices under control. The only exception was Iceland, where already in 2007 prices were growing very fast, an indication of the overheating the Icelandic economy was approaching.

The rapid growth in inflation during 2008, most dramatic in Iceland but also significant in Finland and to some lower degree in Denmark, were mainly a sign of increasing bottlenecks in the economy. At the end of 2008, inflation rates in all countries have been receding fast in a reaction to the impending crisis.

2.2 Competitiveness

While labor productivity, labor input, and price levels explain prosperity in an accounting sense, they cannot give an explanation of the ultimate causes of prosperity. All three are intermediate indicators that reflect some other underlying characteristics of the economy that are the foundations of prosperity. These underlying characteristics are the focus of the competitiveness assessment of the Nordic region.

Competitiveness is measured in the Barometer based on the refined framework introduced in the new Global Competitiveness Index GCI (Porter et al., 2008). The new GCI is organized as a pyramid of indicators at different levels, to allow policy makers to easily identify specific action priorities. The different groups of indicators, at the highest level macroeconomic versus microeconomic indicators, cover different policy areas but are also differentiated by the policy process and the responsibilities that are needed to address them. The 2nd Nordic Globalization Barometer is the first publication to present the rankings of the Nordic countries to a wider audience.

The traditionally strong position of the Nordic countries in the Global Competitiveness Report (GCR) is confirmed by the new methodology. Three Nordic countries are among the global top five, and all five are among the global top ten. Partly this is a reflection of the new methodology which has a number of features that benefit the Nordic countries (Solid fiscal policies and strong institutions, two strengths of the region, are getting a higher weight. Market size, a weakness of the region, is removed from the index and is treated instead as an endowment control). But more importantly it is a reflection of the strong fundamentals that the Nordic economies can rely on.

Overall Competitiveness		
	Level	Change
Nordic		
Denmark		
Finland		
Iceland		
Norway		
Sweden		

Overall business environment quality is measured by the aggregate ranking on competitiveness using the new GCI methodology presented in the Global Competitiveness Report 2008. Change is measured by the change in rank on this measure between 2008 and 2007. Coloring is relative to absolute rank and rank change. Source: Unpublished analysis, Global Competitiveness Report, 2008.

One of the three Nordic countries that improved their rank in 2008 is Iceland. The data was collected in early 2008 and might thus have been one of the last signs of the exuberance building up in the Icelandic economy. But while Iceland remains the lowest ranked Nordic country, it has still consistently performed among the 15 most competitive economies globally since 2001, the first year for which comparable data is available. This is a sign of the real potential Iceland's economy continues to have, despite the huge burden it is facing after the collapse of its financial system.

While the overall level of competitiveness is an important indicator to gauge the fundamental sustainability of a country's standard of living, it provides only very limited guidance to policy makers. It is necessary to drill down into the different dimensions of competitiveness and identify the unique pattern of a country's strengths and weaknesses to inform a targeted action agenda.

Macroeconomic Competitiveness			
	Level	Institutions	Macro. Policy
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Level is measured by the 2008 GCI rankings on Macroeconomic competitiveness, Institutions by the rankings on social infrastructure and political institutions, and Macroeconomic Policy by the rankings on macroeconomic policy. Coloring is relative to absolute rank. Source: unpublished analysis; Global Competitiveness Report, 2008.

Macroeconomic competitiveness covers two broad areas that set the general environment in which companies operate:

- **Social infrastructure and political institutions** is an area in which there is wide consensus in the literature about its positive impact on long-term prosperity differences across countries. The GCI measures of this are cover indicators of basic human development, of the role of law, and the quality of political institutions. It is also an area in which the Nordic countries traditionally excel. In 2008, they all continue to be among the global top ten in the relevant GCI measure with three of them occupying the leading three ranks in the world. Other sources confirm this picture: In the latest World Bank's governance assessment the Nordic countries are on the average of all indicators all in the leading group. The same is true in the 2008 Corruption Perception Index. On both measures Norway registered a slight decline while the other Nordic countries stayed stabled
- **Macroeconomic policy** is an area on which there is much more debate about the impact on prosperity over time: While there is, for ex-

ample, clear agreement that excessive inflation and high public debt are detrimental, there are many different opinions on what defines excessive and high. The GCI measures of this area look at government deficit and debt, the inflation rate, and the interest rate spread. The Nordic countries rank generally well on the quality of macroeconomic policy, a position that stayed stable relative to last year (for the 2008 report, 2007 statistical data was the latest available) despite some pressure from rising inflation. Iceland's lower overall rank was especially driven by a relatively high interest rate spread, reflecting the currency risk. Sweden registered slightly higher government debt than its Nordic peers, but ranks overall well within the global top 15.

Microeconomic competitiveness covers two broad areas that have a direct effect on the productivity that companies reach:

- **Quality of the business environment** includes four groups of indicators, following the structure suggested by Michael Porter's influential 'diamond' of competitiveness (Porter, 1990):
 - Factor (Input) Conditions, measured here by data on education and science, infrastructure, and financial markets
 - Context for Strategy and Rivalry, measured here by data on business rules and regulations and the nature of competition
 - Supporting and Related Industries, measured here by indicators of the presence and strength of suppliers and specialized services, as well as the strength of cluster policy
 - Demand Conditions, measured here by indicators of demand regulations and consumer sophistication
- **Sophistication of companies' operational practices and strategies** covers a number of measures related to companies' strategy and operational effectiveness, organizational structure, and internationalization

On both dimensions, the Nordic countries tend to register strong performance. Iceland and Norway are ranking somewhat behind their Nordic peers, but come in within the global top 20. Norway and to a lesser degree Iceland have also registered significant improvements on these indicators over the last few years.

Microeconomic Competitiveness			
	Level	Business Environment	Company Sophistication
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Level is measured as the overall 2008 GCI rank on Microeconomic Competitiveness; Business Environment and Company Sophistication as the rank on the respective subrankings. Coloring is relative to absolute rank. Source: unpublished analysis, Global Competitiveness Report, 2008.

Education and science

The changes in the global economy have increased the benefits of higher levels of skill. And the ability to innovate is becoming increasingly important to capture significant parts of the value generated in global economies chains. For both, the quality of the local education and science system are critical.

Educational Attainment: Science			
	Level	Change	Rel Change
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Level is measured by the point score in the OECD PISA study on educational attainment on science; level data is for 2006, change is the absolute change in mean score for the period 2003 to 2006; rel change the change in rank relative to the OECD average. Coloring is relative to absolute changes/OECD. Source: OECD, 2007.

A first indicator is the **quality of skills** available in a country. The Nordic countries all continue to boast high enrollment rates at all levels of education. Last year's Barometer pointed out that the actual attainment in the field of mathematic was more mixed. The data on educational attainment in science presented below presents a similar picture. Overall the region is doing well and has improved its mean score from 2006 to 2003. But these results are driven largely by the strong Finnish performance while the other Nordic countries registered only moderately improving or, in the case of Sweden and Iceland, falling scores. A review of a broad range of available international assessments of educational attainment in primary schools provides a slightly more positive view but points out negative trends in Norway and Sweden (Skolverket, 2009).

Innovation Infrastructure		
	Level	Change
Nordic		
Denmark		
Finland		
Iceland		
Norway		
Sweden		

Level is measured as the overall 2008 GCI rank on innovation infrastructure (including several measures of university research and the education systems), change is measured as the change in rank between 2008 and 2007. Coloring is relative to absolute rank. Source: Unpublished analysis, Global Competitiveness Report, 2008.

A broader measure of the available **innovation infrastructure** is assessed in the Global Competitiveness Index GCI. The composite indicator capturing both different aspects of the education and the science system give the Nordic region high marks overall, with only Norway outside of the global top ten. Both Sweden and Norway have lost marginally in position between 2008 and 2007. Iceland registered a strong improvement, possibly a reflection of changes in the innovation system taking effect.

For the commercial impact of the innovation infrastructure, the quality of the **intellectual property system** is increasingly important. The Nordic countries score well on this measure, but not as strong as in other aspects of the innovation system, Finland and Denmark rank among the top five countries in the world on the Intellectual Property Rights Index calculated by the Property Rights Alliance. Norway, Sweden, and Iceland follow on ranks 15, 17, and 23 respectively. For countries with such a clear focus on knowledge, especially in the case of Sweden also on music exports, these rankings seem surprisingly low.

Patenting			
	Level	Change	Rel Change
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Patents are measured as patents filed per capita in the US. Changes are changes in the patenting per capita activity 2007 versus 2006; relative change is change in patenting activity relative to the OECD (without US) and EU-15. Coloring is relative to absolute numbers. Source: USPOT, 2008

In terms of the output of the education and science system, **patenting** remains an important measure. On the level of patenting the Nordic region remains strong, significantly ahead of the EU-15 in terms of patenting per capita. But the trend of slowing patenting rates by the Nordic countries in the US has continued in 2007, the last year for which now data is available. The Nordic countries have seen their patenting intensity drop faster than both the OECD (excluding the US, which has a home country bias in the data) and the EU-15. The only country gaining position is Norway, traditionally the weakest of the Nordic countries. In the assessment of **universities** published by Times Higher Education the Nordic countries improved their position substantially in 2008. Five instead of two Nordic institutions are registered amongst the global top 100 and with one exception all of the Nordic universities in the global top 200 have seen their ranking improve.

The Nordic countries remain among the most innovation- and knowledge-driven economies in the world. But at the individual country level

there is a need to take action for keeping it that way (OECD, 2008). Sweden is highly dependent on the R&D spending of large foreign-owned companies, some of which might be threatened in the current crisis. Norway still lags its Nordic peers on a range of innovation indicators. Denmark graduation levels in science and engineering are insufficient to keep current levels of skill intensity and meet future demands. The Finnish innovation system remains strong, but also some isolated and very dependent on a few companies and on electronics. Iceland made strong improvements in its innovation performance over the last few years, but is now facing the challenge of sustaining them in the face of a much harsher general economic and policy environment.

Infrastructure

Infrastructure remains an important driver of competitiveness and company productivity. While it is for advanced economies increasingly hard to gain true competitive advantages from infrastructure, weaknesses in this area can limit growth and drive economic activities towards alternative locations.

On the quality of the **physical infrastructure** for transportation and communication the Nordic region ranks generally well. On the respective composite indicator in the GCI, Denmark and Finland are stable among the leading countries in the world. Sweden dropped out of the top ten in 2008, while Norway and Iceland moved into the top twenty. The World Bank's Logistics Performance Index includes assesses a wide range of transportation and logistics-related factors. Here Sweden ranks the highest as the 4th ranked in the world, presumably a reflection of a strong base of logistics-related services, with Denmark, Finland, and Norway following on ranks 13, 15, and 16.

On the presence and quality of the **information and communication infrastructure**, the Nordic region does very well. Even the slightly lower rankings of Finland and Norway on the respective GCI composite indicator are likely more a sign of the larger shift away from fixed line telephones, one of the indicators assessed, than of any weakness. The Nordic countries also rank among the top fifteen countries globally on internet hosts per capita, broadband connections per capita, and secure servers per capita. Iceland ranks number one globally on all three indicators.

Physical Infrastructure			
	Logistical (GCI)	Logistical (World Bank)	ICT (GCI)
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Logistical (GCI) is measured by the rank on logistical infrastructure in the 2008 GCI, Logistical (World Bank) by the rank on the World Bank's Logistical Performance Index, and ICT (GCI) by the rank on the Communications Infrastructure index in the 2008 GCI. Coloring is relative to absolute rank. Source: unpublished analysis, Global Competitiveness Report 2008, World Bank Logistical Performance Index, 2008

Access to Capital

Financial capital is, alongside the human and physical capital discussed in the previous two sections, a critical third input factor needed by business. A strong financial system is crucial to allocate capital productively and provide promising business ideas with the necessary financing.

The Nordic countries continue to rank well on the overall quality of their **capital market infrastructure**. Denmark and Sweden rank highest overall, Denmark after further gains in the perceptions about the quality of regulatory environment for financial markets in 2008. Iceland saw a significant drop in measures of access to capital, pushing the country to the 10th rank overall. Finland and Norway also gained on regulatory issues, Finland even on some measures of capital access. The Nordic countries also rank well in the Milken Institute's Capital Access Index. Sweden, Finland, and Norway rank among the global top ten, all with gains relative to the previous year. Denmark comes in at an unchanged 14th rank (Iceland is not covered in this ranking).

Capital Market Infrastructure			
	Level	Change	Capital Access
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Level is the ranking on the GCI Capital Market Infrastructure category in 2008; change is the change in rank between 2008 and 2007 on this measure. Capital Market Access is the ranking in Milken Institute's Capital Access Index 2007. Coloring is relative to absolute rank. Source: Unpublished analysis, Global Competitiveness Report, 2008; Capital Market Access Index 2008.

The Nordic countries position as **financial centers** is relatively modest (City of London, 2008). Stockholm ranks highest, at 32nd globally and 10th in Europe Helsinki (global rank 40), Copenhagen (44), and Oslo (45) follow. Compared to the previous year, the Nordic financial centers held their position or registered modest drops in rank. This data is consistent with the Nordic financial centers playing a role as regional financial hubs, not as centers with strong global reach.

A traditional strength of particularly the Swedish financial market is the high level of **venture capital (VC)** activity. In 2007, the Nordic countries attracted 12% of all European VC investments, higher than the region's 8% share of GDP and also above its 9% share of all VC raised (EVCA, 2008). In the first half of 2008, VC investments in the Nordic countries dropped by 33% relative to the same period in 2007, compared

to a 17% for Europe as a whole. The relatively high level of VC activity is testament to the presence of many interesting new ventures and a well developed financial infrastructure in the Nordic countries. But the current downturn suggests that VC in the Nordic region is also more exposed to the global turbulences in financial markets.

Conditions for doing business

The context for strategy and rivalry that companies face determines whether government rules and regulations make it more or less attractive for companies to engage the available factor inputs in creating valuable products and services.

On the **ease of doing business**, i.e. the administrative rules and regulations that affect at what cost companies can be operated, the Nordic countries do generally quite well, although not as strong a most on factor conditions. Denmark and Finland rank among the global top ten, with the other Nordic countries coming in between rank ten and twenty. Relative to last year, Denmark and Iceland kept their rankings while the other Nordic countries registered a small deterioration of their position. Their modest drop in rank was driven by improvements in other countries rather than absolute deteriorations in the conditions businesses face in the Nordic countries. Finland, in particular, has registered a high number of reforms over the last few years, despite the small drop this year. On **administrative infrastructure**, a composite indicator calculated in the GCI to capture different aspects of how effective government agencies are in performing their assigned tasks, the Nordic region does even better. This is consistent with their strong position on social infrastructure and political institutions discussed above.

Rules and Regulations for Business			
	Level	Change	Administrative Infrastructure
Nordic	Yellow	Red	Green
Denmark	Green	Yellow	Green
Finland	Yellow	Red	Green
Iceland	Yellow	Yellow	Green
Norway	Green	Red	Yellow
Sweden	Yellow	Red	Green

Level is the overall ranking in the World Bank Doing Business 2009; change is the change in rank between 2009 and 2008. Administrative Infrastructure is the ranking on this category in the 2008 GCR. Coloring is relative to absolute rank. Source: World Bank Doing Business 2009, unpublished analysis, Global Competitiveness Report, 2008.

On the level of **government interference in markets**, the Nordic region continues to rank similar to many of its peers among advanced economies and better than many other European countries. Denmark and Norway in particular improved their rankings, while Sweden registered a slight deterioration relative to 2007. Overall, the Nordic countries are

viewed as having very open markets with equal conditions for all companies. However, the large size of the government sector is seen as a factor that reduces the domain in which private companies can operate.

Economic Freedom		
	Level	Change
Nordic		
Denmark		
Finland		
Iceland		
Norway		
Sweden		

Market institutions are measured by the aggregate ranking in the Heritage Economic Freedom index. Level data is for 2008, changes for 2008 relative to 2007. Coloring is relative to absolute rank. Source: 2009 Index of Economic Freedom, Heritage Foundation, 2009.

On the attractiveness of doing business, in particular the level of taxes that have to be paid, the Nordic countries are in a much weaker position. Last year's Barometer reported the absolute levels of **taxation** and found the Nordic countries on the top of the personal income tax scale globally. On the taxation of companies, they ranked much better, somewhat below the average of advanced economies. This position has not changed significantly in 2008, although some tax reductions, especially for taxes on labor, have come into effect in some of the Nordic countries. The level and recent changes in actual tax levels are reflected in the perceptions of the effects of taxation on incentives and competition documented in the GCI. On the perceived overall incentive effect of the tax system the Nordic countries rank all low, with Iceland and to some degree Norway an exception. With the exception of Denmark all Nordic countries ranked somewhat better on this measure than last year. On the distortions introduced into competition as a result of taxation and subsidies the picture is marginally better than on the incentive effect. Even here, however, especially Denmark and Finland rank far below their strong positions on other aspects of competitiveness.

Effect of Taxation			
	Incentive Effect	Change of Incentive Effect	Distortive Effect
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Incentive effect is the ranking on the GCI indicator '(low) impact on incentives to work and invest' in 2008; change is the change in rank between 2008 and 2007 on this measure. Distortive Effect is the ranking on the 2008 GCI indicator '(low) distortive effect of taxes and subsidies on competition.

Coloring is relative to absolute rank. Source: Unpublished analysis, Global Competitiveness Report, 2008.

Some of the tax burden might reflect choices by society and is compensated by the solid factor inputs it helps finance. But the incentive and distortion effects of taxation and government transfer/subsidies are also a reflection of the specific way they are imposed, not just their absolute level. Other improvements should be possible in the administrative burden associated with tax payments: Despite comparable levels of overall taxation, the World Bank's Doing Business measurement of taxation procedures registers huge heterogeneity in administrative ease across the Nordic countries. Finland ranks a poor 97th on this measure globally, with Sweden next at 42nd, unchanged from last year. Denmark (13th; gain of three ranks) and Norway (18; unchanged) show that taxes can be raised without imposing a significant additional bureaucratic burden on individuals and companies.

Context for competition

The intensity and nature of competition on domestic markets is a core driver of the productivity and level of innovation an economy ultimately achieves. It is as much a reflection of government policies as of the decisions that companies take in response to the conditions they face.

The Nordic countries continue to receive good rankings for the overall **context for domestic competition**. And with the exception of Sweden, which even after a slight drop this year remains the second best country in the Nordic region, all Nordic countries improved their position on this measure. Despite these positive general conditions, the actual level of rivalry on domestic markets continues to be ranked relatively low. This is not the result of lax competition policy, an area in which all the Nordic countries reach strong ranks among the global top fifteen.

Context for Competition			
	Overall	Change	Competitive Intensity
Nordic	Green	Green	Red
Denmark	Green	Green	Red
Finland	Green	Green	Yellow
Iceland	Yellow	Green	Red
Norway	Yellow	Green	Yellow
Sweden	Green	Red	Red

Overall is the ranking on the GCI Context for Strategy and Rivalry score, change is the change in rank between 2008 and 2007 on this measure. Competitive Intensity is the ranking on the GCI indicator for Intensity of Domestic Competition in 2008. Coloring is relative to absolute rank. Source: Unpublished analysis, Global Competitiveness Report, 2008.

The low level of actual **rivalry** is consistent with the high price levels that continue to reduce prosperity in the Nordic region. As last year's Barometer already argued, it is more likely that the modest size of the

individual Nordic markets and the lack of true integration among them is one important driver, reducing the entry of foreign companies despite the high degree of formal openness. The low level of entrepreneurship, another weakness of the Nordic region pointed out in last year's Barometer, is as much result and reason of the lack of more strongly contested domestic markets. Markets with entrenched structures can contribute to lower rates of entrepreneurship, especially in combination when the government controls a large share of GDP and taxation levels are high. And the absence entrepreneurs that challenge existing market structures make it easier for incumbents to defend their existing market positions.

Cluster presence

Clusters are regional agglomerations of producers, suppliers, services providers, research and educational institutions, etc. related through input-output relations, knowledge spillovers, shared use of input markets, and other linkages. There is rich evidence that their presence adds to the productivity potential of companies (Ketels, 2009). If there is active collaboration in addition to pure geographic proximity, the strength of these linkages and their benefits for company productivity can be even higher.

On the presence of **related and supporting industries**, the core of clusters, the Nordic countries continue to get overall high markets. This is all the more remarkably, as smaller countries face a real choice between specializing in clusters and covering a broad set of economic activities. The data suggest that the Nordic countries have by and large used the opportunities of being fully integrated in the global economy to specialize. This remains true despite a slight drop in rank by Sweden, driven by a much more skeptical view of local supplier quality compare to last year. **Cluster policy**, i.e. government programs to support and development the competitiveness of clusters, seems to have played some role in this process. The low rank Swedish cluster policy receives in the survey of business leaders will undoubtedly come as a disappointment to government agencies that have invested significant energy in such programs over the last few years. This could suggest the need to integrate the individual cluster efforts into a broader national strategy

Related and Supporting Industries			
	Level	Change	Extent of Cluster Policy
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Level is the ranking on the GCI Related and Supporting Industry category in 2008, change is the change in rank between 2008 and 2007 on this measure. Extent of Cluster Policy is the ranking in the 2008 GCI on this indicator. Coloring is relative to absolute rank. Source: Unpublished analysis, Global Competitiveness Report, 2008.

Last year's Barometer had drawn on the data in the European Cluster Observatory to analyze **specialization levels** across clusters in Nordic regions versus their European peers. It turned out, that the Nordic countries tended to have a relatively low share of their cluster sector employment in strong regional clusters, i.e. clusters that show significant regional concentration ($LQ > 2$). On a broader measure that weights less employment-intensive cluster categories more, the Nordic countries do better. This is consistent with the Nordic specialization in more technology- and knowledge intensive clusters such as advanced services, telecommunication products, and life sciences.

Demand conditions

Demanding customers and regulatory standards put pressure on companies. While this can be a burden in the short term, it can lead to higher productivity and innovative dynamism over time.

Last year's Barometer identified **demand sophistication** as a core strength of the Nordic region. It suggested that it might be one of the dimensions that really distinguish the region from its global peers and could thus be a part of this unique positioning in the world economy. The 2008 data confirms this assessment. All Nordic countries are now in the global top ten on the aggregate measure of demand sophistication in the GCI. Four of them improve their ranking, and Sweden remains among the global top five despite slipping marginally by one rank. **Regulatory standards**, the part of demand conditions that can most easily be affected through government policy, are a particular strength of the Nordic region. Designing stringent regulations in a way that they drive innovation and foreshadow the evolution of global market trends will remain an important task for Nordic policy makers.

Demand Sophistication			
	Overall	Change	Regulatory Standards
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Level is the ranking on the GCI Demand Conditions category in 2008; change is the change in rank between 2008 and 2007 on this measure. Regulatory Standards is the ranking in the 2008 GCI on the Presence of Demanding Regulatory Standards indicator. Coloring is relative to absolute rank. Source: Unpublished analysis, Global Competitiveness Report, 2008.

Company sophistication

The sophistication of companies, i.e. their adoption of new management methods and their way of competing, marks the final step to realize pro-

ductivity levels that fully mobilize the potential inherent in the quality of a country's business environment.

The Nordic countries continue to have a strong position in overall **company sophistication**. Three of them rank among the global top ten and all of them are among the global top twenty. Four of them improved their rankings since 2007. Sweden kept its position but has on global rank 5 now been surpassed by Denmark at rank 3 for the Nordic top position. The nature of competitive advantage on which companies compete, i.e. whether they compete on low costs or on differentiated strategies based on innovation and uniqueness, is one of the most important elements of overall company sophistication. It is an area in which the Nordic companies continue to receive high rankings. Finland registered the largest positive change on this indicator, moving from rank 12 to rank 5.

Company Sophistication			
	Level	Change	Competitive Advantages
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Level is the ranking on the GCI Company Operations and Strategy category in 2008, change is the change in rank between 2008 and 2007 on this measure. Competitive Advantages is the ranking in the 2008 GCI on the Nature of Competitive Advantages indicator, Coloring is relative to absolute rank. Source: Unpublished analysis, Global Competitiveness Report, 2008.

New research comparing **management quality** across a larger set of task and a number of countries are in line with the view that the Nordic countries are home to well run companies. Sweden, the only Nordic country regularly included in these assessments, ranks among the top countries on overall management quality (Bloom et al., 2007).

2.3 Globalization Readiness

In a global market, having strong competitiveness fundamentals is not enough to sustain and develop high prosperity. Countries also need to engage actively with the global economy, creating outward and inward linkages, and prepare for the shocks that might affect them through these channels. This is why last year's Barometer introduced the notion of 'Globalization Readiness' as a measure of how well the Nordic countries are performing on these three dimensions.

Selling on foreign markets

Exports of goods and services are the traditional way to leverage domestic strength on a global market. The Nordic countries continue to register a world **export** market share of roughly 4%, about 70% higher than their share of global GDP (WTO, 2008). While there was little change on an aggregate level, Denmark has lost some position while Sweden and particularly Iceland have gained ground. For Iceland, this is a clear indication that the economy has export potential beyond the now defunct financial services sector. The other change was a continued shift from goods to service exports, a trend that has been under way for some time and is even more pronounced for the Nordic countries than for global trade overall. Goods exports are, however, still significantly larger by overall value.

Change in Exports World Market Shares			
	Overall	Goods	Services
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Overall is measured by the relative change between 2007 and 2006 in total world export market share. Goods and Services are measured the same way for the respective subcategories of total trade. Coloring is relative to absolute changes. Source: WTO, 2008.

Outward foreign direct investment (FDI) is another way to export knowledge and capabilities. The Nordic countries continue to perform strongly on this measure. Norway and Finland fall broadly within the range of other advanced economies in terms of their share of global **outward FDI** stocks relative to the size of their economies. The Nordic other economies are significantly higher. Iceland was far ahead on this measure after years of strong outward FDI growth. It was the fragility of the foreign financing of these activities abroad that, however, brought down the

Icelandic financial sector. On the absolute change of the outward FDI stock market share, the Nordic countries register a weaker performance. With the exception of Iceland, all have lost market share in terms of the global outward FDI stock. This suggests that the value of especially the existing Danish and Swedish outward FDI stock has not developed as strongly, given that both posted solid outward FDI flows.

Outward Foreign Direct Investment			
	Stock	Flow	Stock Change
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Share is measured by 2007 world market share of outward FDI stock relative to share of world GDP. Flow is measured by 2007 world market share of outward FDI flows relative to share of world GDP. Stock change is measured as percentage change of world market share in outward FDI stocks between 2007 and 2006. Coloring is relative to Advanced economies/EU benchmark. Source: UNCTAD, 2008.

Last year's Barometer also pointed out that the Nordic countries have a strong number of multinational companies headquartered in the region. There have been no strong changes in this respect, even though the market value of these companies has suffered as global equity markets have collapsed in late 2008.

Attracting foreign interest

In the global economy, no economy can compete based on its own inherent resources and capabilities alone. It also needs to attract investment capital, human capital, and ideas. And it has to retain its own companies and people as far as they can choose where to invest or live and work. Attracting global interest is both an indicator and enabler of global competitiveness, just like the ability to see internationally: Only competitive locations are able to attract foreign interest. And the inflow of foreign capital and skills makes a location more competitive.

Inward Foreign Direct Investment			
	Stock	Flow	Stock Change
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Share is measured by 2007 world market share of inward FDI stock relative to share of world GDP. Flow is measured by 2007 world market share of inward FDI flows relative to share of world GDP. Stock change is measured as percentage change of world market share in inward FDI stocks between 2007 and 2006. Coloring is relative to Advanced economies/EU benchmark. Source: UNCTAD, 2008

The Nordic countries continue to host a relatively large stock of **inward foreign direct investment (FDI)** relative to the size of their economies. Norway continues to be the laggard in terms of FDI attraction and the figures for the last year only confirm this picture. Recent inflows for the Nordic region overall have been in line with the region's economic size but were not sufficient to avoid a loss in the Nordic's world market share of inward FDI.

Last year's Barometer also took a closer look at the inflow of foreign knowledge to the Nordic region. It found several indications that the Nordic countries are lagging many of its advanced country peers on the attraction and subsequent integration of skilled employees. The recent trends, however, have been somewhat more encouraging. The patenting data analyzed indicated that the Nordic countries are an attractive location for research by foreign companies and that researchers from the Nordic region are frequently engaged in research projects with foreign partners. Institutions from the Nordic EU members have also taken a relatively high share of project leads in EU Framework Program projects compared to their countries' GDP (Ketels, 2008).

Flexibility

The ability to adapt to changing conditions is increasingly important in the global economy. While this is sometimes seen as a contradiction to the need for specialization, it is in fact closely connected to it. Regional economies can only succeed in the global economy if they reach the high level of productivity that economic specialization is needed to achieve. But specialization in turn exposes regional economies to the impact of external shocks. High levels of prosperity can only be sustained where regions are able to transfer their productive resources to new economic activities. In the short term, being more flexible can seem as a disadvantage as companies find it less costly to reduce employment in flexible rather than in rigid economies. In the long term, however, it creates much more attractive conditions for companies to make investments that create competitive employment opportunities.

The Nordic countries continue to present a mixed picture in terms of key formal rules and regulation affecting their flexibility. On **labor market flexibility**, the World Bank assessment continues to give them very weak scores. However, last year's Barometer already pointed out that the actual flexibility of the Nordic labor markets might be much higher. Research by the OECD on labor market outcomes points strongly in this direction. Other work looking at the relationship between employment security and employability comes to a similar conclusion (European Foundation, 2008a). On the costs associated with **closing down businesses**, the Nordic countries have traditionally been quite strong. This continues to be the case in 2008. In the short term, pressure might rise to create more exit barriers, as multinational companies find it easier to close operations in the Nordic countries than, for example, in Continental

Europe. In the longer term, however, this higher level of flexibility is likely to enable a faster recovery after the crisis. On the costs of **starting a business**, the Nordic countries look weak. While many other factors influence the formation of new businesses, complex and bureaucratic rules on starting a business do play a role. That the Nordic countries are behind many of their peers on the respective regulations is noteworthy, especially given the strong political will and rhetoric across the region on the importance of entrepreneurship.

Flexibility			
	Labor Market	Closing a Business	Starting a Business
Nordic	Red	Green	Red
Denmark	Green	Green	Yellow
Finland	Red	Green	Yellow
Iceland	Red	Yellow	Yellow
Norway	Red	Green	Red
Sweden	Red	Yellow	Red

Labor Market is measured by the World Bank Doing Business 2009 rank on Labor Market Flexibility. Closure of Business is measured by the World Bank Doing Business 2009 rank on this indicator. Registration of Business is measured by the World Bank Doing Business 2009 rank on this indicator. Coloring is relative to absolute rank. Source: World Bank, 2008.

2.4 Overall assessment

The data presented in this 2009 Nordic Globalization Barometer does signal broad stability of the high competitiveness and globalization readiness achieved by the Nordic region. The short-term changes in prosperity and its arithmetic drivers are largely driven by the state of the business cycle. There are no signs of structural changes that would have gone against what would have been expected for the Nordic countries given their position in the cycle.

The high level of competitiveness continues to explain well the high levels of current prosperity across the Nordic countries. This should give some calm in the face of the current economic crisis. Competitiveness, essentially a supply-side measure of the productive potential of an economy, cannot shield from a slump in global demand. But the economy will over time move back to its normal level of activity, partly through automatic adjustments and partly as the result of policy interventions. And then the competitiveness fundamentals will again be critical for economic performance, a prospect that bodes well for the Nordic countries.

This unfashionably optimistic statement even holds in part for Iceland. The data shown in this Barometer does suggest that Iceland does not face a competitiveness problem. But Iceland clearly faces a dramatic macroeconomic problem, as will be discussed in more detail in the last chapter of this Barometer. And there is a danger that the fall-out from the macroeconomic crisis, both in its direct effects on citizens and companies and in its indirect effects on the course of economic policy that Iceland now chooses, could reduce the country's competitiveness and long-term prosperity.

While the current level of competitiveness and globalization readiness in the Nordic region is high, the concerns raised in last year's Barometer remain firmly in place:

- The **catch-up** by others continues, even though the current crisis will put a break on the upgrading of many emerging economies for some time. And this will require the Nordic countries to be alert on sustaining their solid level of workforce skills, infrastructure, and capital availability.
- The **transition to knowledge-based competition** continues. And this raises the concern about eroding performance on science skills and patenting, two traditional strengths of the Nordic countries.
- The move from prosperity created by large, capital-intensive companies to prosperity created by **knowledge-intensive entrepreneurs** continues. And this will raise the cost of current taxation patterns and other barriers faced by new entrants, already evident in the relatively low level of entrepreneurship in the Nordic region.

- The Nordic region continues to pay the price for its lack of deeper **market integration**. This is one of the key reasons for the low level of competition on its markets, reduces the opportunities for entrepreneurial entrants looking for higher number of potential customers, limits the attractiveness of the region for foreign investors, and reduces Nordic citizens' prosperity levels through higher than necessary price levels.
- The way competitiveness is translated into prosperity in the global economy continues to migrate **from exports to FDI to knowledge flows**. The Nordic countries experience this transition first-hand and it continues to be important to find ways in which it happens in a way that contributes to Nordic prosperity. Last year's Barometer asked questions about how it could be insured that the aggressive outward FDI drive of Icelandic companies benefited the Icelandic economy. These questions appear in a new light given the experience of the last few months.
- Globalization has changed the level of **risks** economies are exposed to. Flexibility in reacting to such crisis will be an increasingly integral part of global competitiveness in the future. The Nordic countries need to sustain and where needed increase the flexibility of their economies.

One of the most complex challenges facing the long-term global competitiveness of the Nordic countries at the moment is the lack of attention from policy makers. With the financial and economic crisis (discussed in more detail in chapter 4) forcing governments to launch massive short-term actions, there is a clear danger that longer-term competitiveness issues will be pushed from the agenda. In the short run, the crisis could relieve pressure on scarce factor inputs and improve the relative competitiveness of the Nordic countries. But in the longer run a neglect of competitiveness as a consequence of the current crisis could have clearly negative effects.

3. Energy and the environment: The Nordic countries in global perspective*

Secure energy availability and a healthy environment are important objectives in their own right, contributing directly to a country's standard of living. Both have also a firm place in the discussion of global competitiveness: Secure energy and a healthy environment enable economies to operate more productively. And productive economies in turn use less energy and are more efficient in their use of other environmental resources as well. While a trade-off between environmental and economic objectives is possible, there are many areas in which both are highly compatible, especially in the longer term (Porter/Van der Linde, 1995).

For the Nordic countries, two other aspects are important. First, energy and environmental technologies have the potential of **positioning** the Nordic region in the global economy. As last year's Barometer pointed out, general qualities are increasingly insufficient to achieve success in the global economy. Locations need to add a unique set of qualities or value propositions that distinguishes them from their peers. For the Nordic countries, the area of energy and environment could play such a role. This would be particularly attractive because of the increasing role that products and services related to energy and environment are expected to play in the global economy.

Second, energy and environment are areas in which **cross-national collaboration** plays an important role. Energy grids cover groups of countries and are well established in the Nordic region. Many environmental problems travel across borders and can only be addressed effectively in cross-national efforts. The 2009 program of the Icelandic Presidency in the Nordic Council of Ministers identifies the promotion of environmental and energy research as one of its key priorities. The ambition of the Nordic countries in this field is also visible in the upcoming Copenhagen climate summit in December 2009.

The following chapter provides three different perspectives on the potential role of energy and the environment in the global competitiveness of the Nordic countries: The first section discusses the status of energy use and production, of environmental conditions, and of broader policy trends across the Nordic countries in these two areas. The second section then looks at the capabilities of the Nordic countries on energy and the environment. The third section then presents data on the measurable economic outcomes achieved. A final section concludes with a number of overall observations and policy recommendations.

* This chapter was drafted by Johanna Roto, Patrick Galera-Lindblom, and José Sterling from Nordregio, Stockholm.

3.1 Energy and environment in the Nordic countries: The current status

Countries energy and environmental conditions are the result of the natural circumstances they have to deal with, but also of the policies and behavior that it triggers. The following section gives an overview of the energy market, the environment, and then some key policies and policy challenges faced in the Nordic countries.

Energy

The geographical features of the Nordic countries drive high **energy demand**. Heating costs are pushed up by the low average temperatures in the climate zone the Nordic countries are located in. Transportation costs are driven by low population density and large distances in the Nordic region. Despite these challenging conditions, the Nordic countries register overall moderate levels of energy consumption relative to their level of GDP (Ketels, 2009). Denmark reaches a particularly high level of energy efficiency across the entire economy, but Norway and Sweden outperform the European average as well. Denmark and Sweden have also increased their **energy efficiency** significantly over the last decade, much more than their European peers. Finland also improved on this measure, roughly at equal pace as the European average. Norway and Iceland registered roughly stable energy efficiency on the economy-wide level.

Country	Indigenous production	Total primary energy supply							Energy dependency
	Total energy production in 1000 toe	Total, in 1000 toe	% generated from source					Other	% in 2005
			Oil & Gas	Coal	Nuclear power	Hydro power	Wind power		
Denmark	29511	21505	59.4	25.5	0.0	0.0	2.4	12.7	-51.6
Finland	17787	36785	40.4	20.2	16.1	2.7	0.0	20.6	54.7
Iceland	3259	4248	23.3	0.0	0.0	14.8	0.0	62.0	28.8
Norway	223650	24943	50.5	2.9	0.0	41.2	0.2	5.3	-609.1
Sweden	32275	50251	30.8	5.4	34.4	10.6	0.2	18.7	37.2
EU-15	693947	1537627	63.6	14.2	15.0	1.5	0.5	5.2	57.7

Production of energy in the Nordic Countries by type, in 2006. Oil and gas include crude oil, petroleum products and natural gas, other renewable sources include solar, biomass, waste and geothermal energy. Source: Eurostat, International energy Agency (2009)

The Nordic countries have a rich **endowment of energy sources**. Taken as one unit, the Nordic region could meet all its energy needs internally, and even have some capacity for export left. Between the Nordic countries, there are, however, significant differences in energy endowments: Norway is producing over 600% more energy than it uses domestically, exporting a large quantity of oil and gas to the global market (fossil energy that in the importing country contributes to CO₂ emissions, Economist (2009)). Denmark's energy production covers about 50% of its own demand, partly from own oil and gas reserves and partly from renewable sources. Norway and Iceland, but also Sweden, have a significant production of electricity based on hydropower. In Finland and Sweden nuclear power is a major source of energy. Iceland uses geothermal energy production as a substantial contributor to the energy supply.

Finland and Sweden are depended on foreign imports of fossil fuels to close the remaining gaps in their energy supply.

The Nordic Countries generate on average a four times higher share of their electricity from **renewable energy sources** than their OECD peers; for heat production the share is three times higher. The sources of renewable energy differ across the Nordic countries and are driven by domestic availability. Denmark produces renewable energy largely from municipal waste, biomass and wind power. In Finland and Sweden, biomass and hydro power are important. Sweden has in the 1990s made also huge investments in regional heating systems. Iceland has abundant hydro and geothermal power that has attracted energy intensive aluminum production to the island. Norway has large hydropower reserves.

Renewable energy generation			
	Electricity	Heat	Change
Nordic			
Denmark			
Finland			
Iceland			
Norway			
Sweden			

Renewable energy generation is measured as a share of total energy generation. Figures have been calculated separately for electricity (wind, biomass, biogas, solar, hydro and geothermal power) in GWh and heat (geothermal, solar and biomass) in TJ. Change is reflecting to annual average change in both of these. Level data is for 2005, changes for the period 2000-2005. Source: IEA 2008

Denmark has during this period increased the share of electricity consumption produced from renewable sources from 5.8% (1995) to 28.2% (2005). In Finland and Sweden, the use of renewable energy sources has been fairly stable already the last 10 years. The use of renewable energy sources in heat generation has increased in the Nordic countries relatively more than in the other OECD countries. Some renewable energy sources have been exploited close to their natural capacity and future production has now to come from different sources. In Norway and Sweden, for example, wind power appears to be the option with the highest immediate potential for expansion. Offshore windmill parks have become a topic of joint interest among the Nordic countries.

The European Commission (2008) has defined an **energy vulnerability index** that combines internal and external security of supply, energy use and efficiency and carbon emissions these three elements. All Nordic countries, including energy intensive Finland, are better prepared for the energy challenges of the coming years than the EU average. The Nordic countries' existing energy mix allows lower greenhouse gas emissions and lower dependency on fossil energy providers for electricity.

Environment

Most indicators of environmental quality give the Nordic countries high marks. The low level of population density reduces the pressure of economic activity on nature in the Nordic countries and might be one of the reasons, although it is highly unlikely to be the only one.

Environmental Performance Index			
	EPI	SSI	Lisbon
Nordic	Green	Green	Yellow
Denmark	Yellow	Green	Green
Finland	Green	Green	Yellow
Iceland	Green	Yellow	Red
Norway	Green	Green	Green
Sweden	Green	Green	Green

Nordic score in the environmental performance indexes of Yale Environmental Performance Index (EPI), Sustainable Society index (SSI) and environmental Lisbon indicators. SSI including only the 3 environmental themes measured as the simple average of these themes. European structural environmental indicators, so called Lisbon indicators (index of greenhouse gas emissions in CO₂ equivalents; gross inland consumption of energy divided by GDP, in kg of oil equivalent per 1000€; Volume of freight transport relative to GDP; electricity generated from renewable sources) has been measured as the average score of these indicators. Source: Yale University, Sustainable Society Foundation, Eurostat 2008.

The **Yale Environmental Performance Index** identifies broadly-accepted targets for environmental performance and measures how close each of the 149 ranked countries come to these goals. The index focuses on two overarching environmental objectives: reducing environmental stresses to human health and promoting ecosystem vitality and sound natural resource management. The top five countries in the 2008 EPI are Switzerland, Sweden, Norway, Finland, and Costa Rica. Iceland and Denmark register also among the world top 25. Especially the policy categories of environmental health and water resources are in very good condition in the Nordic countries. Denmark scores somewhat lower than the other Nordic Countries because of the intensive agricultural sector.

The Nordic countries come out top in the study of **Sustainable Society index (SSI)**, which covers 151 countries. The overall list is topped by Sweden, with Norway third, Finland fourth, Iceland sixth and Denmark in 14th place. The study covers a total of 22 indicators, clustered in five categories. Two of those, “personal development” and “well-balanced society” are more socio-economically oriented (i.e. gender and education related indicators) whereas the remaining dimensions are more environmentally oriented. Finland is number one in environmental health, followed by Norway on fourth place. Iceland, Norway, Sweden and Finland are the top four countries in sustainable use of resources. The Nordic region scores the lowest in the category “sustainable world”, especially indicators on preservation of biodiversity, emission of greenhouse gases, and the overall ecological footprint of the society. On these indicators, the Nordic countries score roughly similar to other advanced economies.

One of the four cornerstones of the **Lisbon Strategy** set in 2006 is increasing the environmental sustainability of the economy, a goal that was established at a European Council meeting in Gothenburg (Sweden). The development toward this goal is measured by a set of three structural indicators, which provide an instrument for an objective assessment of the progress made towards the Lisbon objectives:

- The index of **greenhouse gas emissions** and targets measures how far the country is from the EU Burden Sharing Agreement as a part of the Kyoto protocol. At the moment Sweden is the only Nordic country which has fulfilled the goal, and Finland and Iceland are the Nordic countries furthest apart from meeting the goal. All Nordic countries are, however, below the per capita level of the OECD as a whole (in 2005 11.02 t CO₂ per capita).
- The **energy intensity** of the Nordic economies is diverse, as was discussed earlier. The Nordic countries have in general become less energy intensive within the last ten years. Denmark is the most efficient energy user in the European Union whereas Iceland is a highly energy intensive economy. Iceland has anyhow managed to preserve the intensity at approximately the same level of overall energy efficiency even though a highly energy intensive aluminium plants has come on line. Also Finland with a heavy industrial sector is above the European average.
- Volume of **freight transport** relative to GDP shows an overall increase both in EU15 and EU27. Of the Nordic Countries only Iceland has increased its ratio between tonne-kilometres (inland modes) and GDP faster than the EU27 average whereas in Sweden and especially in Denmark and Finland the volume has decreased remarkably. Norway is lying between the EU15 and EU27 averages.

Electricity generated from renewable sources has more recently been included in the as an additional Lisbon strategy indicator. All Nordic countries score well on this indicator, as has been discussed above.

The European Commission (2008) has defined a **climate change vulnerability index** which combines both the physical and economic effects of underlying climate change processes and in this respect the Nordic countries can expect rather limited pressures. All Nordic countries cope better than the EU average, with Finland being the least affected country in Europe.

Energy and climate change mitigation policies

Energy policies in the Nordic countries have over time reflected the changing economic and political conditions. In the 1970s supply security concerns dominated the political agenda. Coal power generation was chosen in Denmark while Sweden and Finland decided to use nuclear power. The abundance of possibilities for developing hydropower in Norway resulted in the extensive use of this resource as the main source for energy supply for the nation. In the same time period, Iceland intensified the use of both hydro- and geothermal energy, an energy source that

had been exploited for district heating since the 1930s. Subsequent environmental concerns during the 1980's and 1990's prompted a shift towards renewable source of energy, mainly wind power in Denmark and district heating based on biomass in Sweden and Denmark. The use of new renewable energy sources in Finland and Norway was modest during this period, except in heat production for Finnish industries where combustion of biomass became an important energy source. In Finland and Sweden the forest-based energy systems gave a first impetus for integrating energy policy, environmental policy and various forms of industrial development, innovation, regional planning and regional development policies. In the last two decades, development in the energy sector resulted in a progressive reduction of nuclear power capacity in Sweden while Finland moved in the opposite direction and started work on a new nuclear plant projected to be operative at the turn of 2010-2011.

A common characteristic of the energy sector in the Nordic countries has been a progressive deregulation towards **market-based trading of electricity**, a successful process that has received general political support from the national authorities. To make this happen, the electricity transmission systems between the countries involved have been made compatible by defining joint technical standards and developing common regulatory frameworks. Consequently the electricity sector is today operating in one integrated market with nationally regulated transmission operators cooperating in Nordel.

The main challenge for the Nordic energy sector is the new focus on climate change mitigation. Following a package of proposals released by the European Commission in early 2008, each EU member state is expected to meet the following targets by year 2020:

- Reduce **greenhouse gas emissions** by 20% from 1990 levels
- Increase the share of **renewable energy sources** in energy consumption to a level of 20% (today EU average 8.5%)
- Increase **energy efficiency** by 20%

The package addresses renewable energies, including biofuels, how thoughts about the overall EU greenhouse gas targets will be shared between member states; a revision of the EU Emissions Trading Scheme (EU ETS), the distribution of the reduction effort outside of the emissions trading system, and a directive proposal on how to implement carbon capture and storage (CCS) at power generation plants. Iceland and Norway have also joined the EU Emission Trading Scheme. Under the Kyoto Protocol all Nordic countries have agreed on emission targets for **greenhouse gases**. Even though Iceland and Norway are permitted to raise emissions from 1990 levels, by 10 percent and 1 percent respectively, both countries have set far reaching ambition regarding emission targets. In Norway the government has the aim of making Norway a carbon-neutral country by 2030. In Iceland a reduction target has been set through the Nation's Climate Change Strategy aiming at a level of 50-75% of net emission of 1990.

The Nordic countries have implemented measures through supporting mechanism for both the production and use of **biofuels** for the transport sector, mainly bioethanol and biodiesel. The European target of 5.75 percent of biofuel for the transport sector by 2010 has been ratified by Denmark, Finland and Sweden. Norway has a 2009 target of 5 percent. Research and development on biofuel technologies have also been significant in all Nordic countries. In terms of tax related incentives Sweden and Norway are the only countries where tax exceptions on biofuels are applied. Particularly in Sweden, several tax advantages are used to promote environmentally friendly cars.

In general the success of generating electrical and heat power from **renewable energy sources** in the Nordic countries has been the effect of various support schemes for these technologies such as: feed-in-tariffs - fixed price or premium- (Denmark), green certificates (Sweden), investment support (Finland, Norway and Sweden), tax incentives, taxation of fossil fuels in heat production (Finland, Sweden and Denmark), operation support (Sweden and Denmark), CO₂ emission trading and R&D support. Due to abundance and easy access to hydro and geothermal power in Iceland state subsidies or other support schemes for electricity generation have not been indispensable for the deployment of these energy sources. Iceland is expected to be able to comply with the European energy and climate goals given its use of hydropower and geothermal energy.

European environmental policy is increasingly being implemented through economic instruments such as **environmental taxes**. When looking at the total environmental tax revenues as a share of GDP, Denmark is the leading European country with 6% share, but also Finland, Norway and Sweden lies above the EU average of 2.6%. The result is more or less the same when looking at the total environmental tax revenues as a share of total revenues from taxes and social contributions. The biggest source of environmental tax revenue comes from petrol and diesel. The Nordic countries have also used **product labelling** to promote environmental-friendly products. The Nordic Swan eco-label has become well known led to the development of other eco-labels like the European "Flower".

3.3 Knowledge and capabilities

The Nordic countries are generally strong in skill intensity and research, as chapter 2 of the Barometer has shown. For energy and environment to be a particular strength of the region, it would need to do particularly well on knowledge and capabilities related to these areas.

In **energy-related R&D expenditures** as a share of GDP, Finland leads in Europe but is also the only Nordic country above the EU-15 average. Norway is less R&D intensive overall, but invests a higher share of its R&D expenditure on energy-related activities than any other European country. Sweden's investments in energy R&D are relatively low but the country has leading position in several specific areas such as biofuels, heat pumps, and solar cells. Current patterns of energy production and use have a strong impact on research priorities: Denmark is focusing on investments within the renewable energy sources, Finland within energy efficiency. Sweden is focusing on both of these sectors, while Norway instead is focusing on the fossil fuels.

		Nordic	Denmark	Finland	Norway	Sweden
Total energy R&D investments, in mill €		320.3	81.1	79.3	85.6	74.4
Main theme of investments within energy	Energy efficiency	17.8	9.4	30.7	2.7	30.6
	Fossil fuels	20.8	6.4	8.9	63.3	0.0
	Renewable energy sources	22.7	37.1	15.7	6.4	33.4
R&D, in % of total investments	Nuclear fission	8.1	2.3	12.5	10.2	7.3
	Hydrogen and fuel cells	9.7	25.3	--	10.0	2.6
	Other technologies	6.9	0.8	15.5	3.5	8.4
	Other technical research	14.0	18.7	16.7	3.9	17.7

R&D investments within energy technology in 2006 (Finland 2005). Source: Eurostat, IEA, 2008.

An important measure of **international R&D collaboration** is the participation in the EU Framework Programmes for Research. The activity area 'Sustainable development, climate change and ecosystems – SD&CC' accounted for 7% of all projects under the 6th EU framework programme. For the Nordic countries, 15% of all project participations were related to SD&CC. Of the 719 projects under SD&CC 12% were led by a Nordic partner. Together with Germany and the Netherlands, the Nordic countries were the countries which relatively led most projects in this activity area. All together 785 Nordic partner were involved in SD&CC projects.

SD&CC - 6th framework programme project			
	Participants	Lead	Share
Nordic	785	11.8	15.5
Denmark	194	14.4	16.4
Finland	139	12.2	13.2
Iceland	20	10.0	18.5
Norway	173	8.7	19.4
Sweden	259	12.0	14.3

Nordic participation in the 6th framework programme within the activity area 'Sustainable development, climate change and ecosystems. Number is referring to total number of Nordic partners in SD&CC projects. Lead indicates how many of the SD&CC projects is led by a Nordic partner. Share indicates about the Nordic participation to SD&CC as a % share of all FP6 projects. Source: CORDIS

Numerous Nordic **research institutions** are active in energy and environmental research, many of them with international importance. There are a number of studies measuring and ranking these institutions. The World University ranking of JIU (Institute of Higher Education Shanghai) identifies the universities of Copenhagen, Aarhus, Uppsala and Helsinki as Nordic leaders in the number of articles published in Nature and Science between 2002 and 2006. In the list of top universities within the "natural science and mathematics", there are four Nordic top universities on a list of hundred. Those are Universities of Lund, Copenhagen, Aarhus and Stockholm. The Spanish National Research Council (CSIC) publishes the "Webometrics Ranking of World Research Centers". Altogether 164 Nordic research institutions among the 2500 institutions listed globally. One-third of all included Nordic research centers are working either with energy or environment related issues.

Scientific articles - Energy technologies			
	Rel Share	Article	Co-authorship
Nordic	14.8	Solar & Hydro	Hydro
Denmark	10.5	Wind	Hydro
Finland	13.1	Solar & Hydro	Solar & Hydro
Iceland	6.9	Hydro	Wind & Hydro
Norway	12.1	Hydro	Hydro
Sweden	19.9	Solar & Hydro	Solar & Hydro

Scientific articles in the field of energy technology including solar photovoltaic energy, wind energy, second-generation biofuels, CO2 technology, hydropower and hydrogen energy. The relative share of scientific articles have been calculated as total number of articles within the sector per 100 000 persons. Written article or co-authorship refers to the article category where at least 30% of technology articles have been published. Source: ISI Web of Science, NIFU STEP 2008

Compared to total population, all the Nordic Countries published more **scientific articles** compared in the field of energy technologies than the average of their OECD peers. At the Nordic level studies about hydrogen - and solar photovoltaic energy were the most popular ones. In international co-authorship in scientific publishing studies concerning hydrogen power were even more popular. At the institutional level the biggest Nordic universities are the most visible ones. The Technical University of Denmark, Universities of Uppsala and Lund, the Royal Institute of Technology in Stockholm and Chalmers University of Technology in Gothenburg, in that order, are the most visible institutions in the energy technology sector in the Nordic sample of articles in 1998–2006. Also some public research institutes, such as the VTT Technical Research Centre of Finland and Norwegian SINTEF are included among the top 20 institutes.

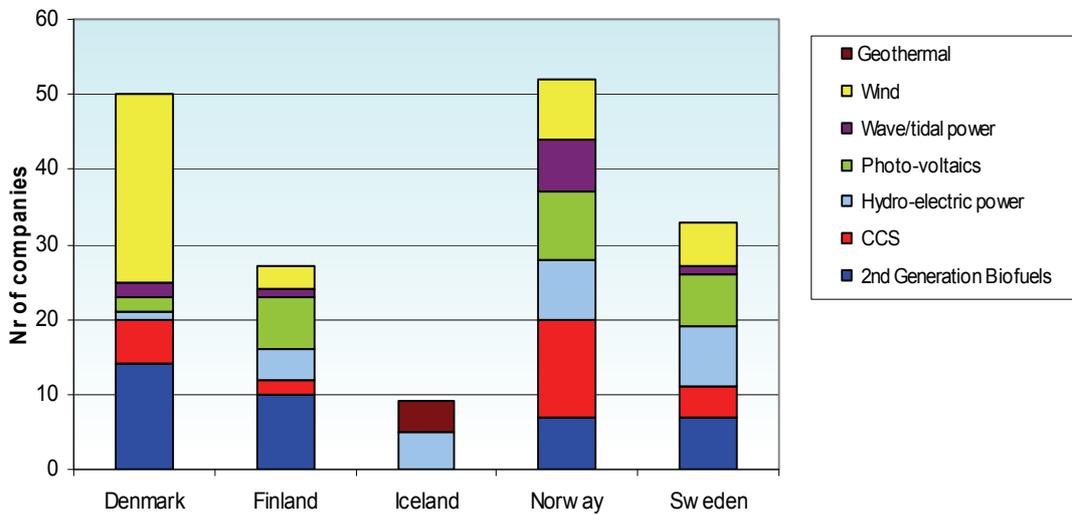
The Nordic countries have a strong position in **international patenting** in energy and environmental technology. Up to 25% of all renewable energy patents in the EU-27 are developed in the Nordic Countries. Denmark is among the global top five in energy and environmental technology patenting. Denmark, Sweden, and Norway show similar or better compound annual growth rates of total patents in renewable energies than the OECD average. In wind power patenting, Denmark leads the Nordic region with 107 patents, followed by Sweden (13), Norway (8) and Finland (5). Norway registers a significant number of patents in hydro-power energy and emerging expertise in photovoltaic energy technologies. Activities in Norway are concentrated on silicon-based solar cells, while patenting in Sweden is specialized in second-generation PV cells. Significant patenting rates are also present in second-generation biofuels based on cellulose ethanol established. Denmark has the largest number of patent applications (52), followed by Sweden (14), Finland (12) and Norway (7). In nuclear energy technologies, Sweden represents more than half of the total number of the Nordic patents in 2005. Nordic patents account for 4% of all OECD patents in this field. In automobile pollution control technologies, Sweden accounts for 5% of the OECD total.

Renewable Energy Patents			
	Number	Growth	Type
Nordic	398	11.2	Wind
Denmark	189	20.4	Wind
Finland	43	-7.8	Biofuels
Iceland	4	1.0	--
Norway	101	28.4	Wind
Sweden	62	13.5	Solar

Renewable energy (RE) patents in the Nordic Countries. Number refers to total number of RE patent applications in 1995-2005 to EPO, growth to the average growth in this time period and type to the main patented RE sector. Patent counts are based on the priority date, the inventor's country of residence and use fractional counts on PCT filings at international phase (EPO designations). Sources: OECD, Patent Database, June 2008; EPO Worldwide Statistical Patent Database, October 2007.

NIFU-STEP (2008) has identified companies with a strong R&D profile in different dimensions of energy technologies. Nordic companies with high energy related R&D investments are companies like Norwegian Statoil and Norsk Hydro (oil & gas producers), Swedish Vattenfall (electricity production) and Danish Vestas Wind Systems (Electrical components & equipment in wind power). Clear differences in specialization across countries emerge that are consistent with the specific profile of energy production per country.

Companies with high R&D spending in renewable energy



R&D company profile in selected fields of energy technology. The selection criteria have been R&D activities documented in patent statistics, bibliometric statistics, R&D project funding by the EUPF5 or Nordic Energy Research and research reports. Data source: NIFU STEP

3.4 Current economic importance

Companies active in energy and environmental technologies have a direct impact on the economy. The European Commission and the OECD have defined **eco industries** as “activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems. That includes technologies, products and services that reduce environmental risk and minimize pollution and resources”.

The Nordic EU Countries (Denmark, Finland and Sweden) account for 9% of the EU eco industries according to the EU, significantly above the region’s share of European GDP. The total turnover of the eco industries in the Nordic countries is €2638 million with an aggregate employment of about 300,000 full-time jobs. Relative to national GDP the turnover of eco-industries is highest in Denmark. Finland registered the most dramatic growth between 1999 and 2004 at 54%. Both Sweden and Denmark’s percentages of change are above the EU-15 level (18%). Sweden and Denmark are on top of the ranks regarding total percentages of Pollution Management in eco-industries turnover with values between 70-80% while the percentage in Finland is less significant (40%). Danish and Swedish turnovers concerning Waste Water Treatment and Solid Waste Management & Recycling industries are significantly high. These two categories are part of the three largest eco industry sectors in the EU. In Resource Management, both Finnish and Danish figures are considerably higher in renewable energies categories, associated in Denmark to Wind power and in Finland to Biomass energy.

The Nordic countries register about 7% of all EU exports in eco industries, with Sweden alone accounting for 4%. The largest Nordic export categories in 2004 include:

- Other environmental equipment (€282,3 million or 11% of the EU)
- Air pollution control (€185,91 million or 7%)
- Water pollution control (€160 million or 7,5%)

In wind power, Denmark represents one of the top five worldwide producers. With a total export of €4.7 billion in 2007, the Danish wind industry set a new record, Compared to previous year, exports increased by €1.1 billion or 30.7 %.

The Nordic region is home to some **environmental technology clusters** such as the wind energy cluster in Denmark, the geothermal cluster in Iceland, and the Finnish bioenergy and forestry cluster. An important explanation for the good Finnish performance in bio-energy is the integration with the forest industry cluster. Forest industry complexes are energy self-sufficient. Through the integration it has been possible to reduce investment and operational costs and gain adequate economies of scale. Similar models are possible for agricultural crops and several sorts of biomass-based fuel can be co-fired with coal or peat. Such integration

of fossil and biomass fuels has been an important source for combined power and district heating plants in Denmark

The Icelandic geothermal energy cluster

By: Hallgrímur Jónasson, RANNÍS

Iceland is endowed with an abundant supply of geothermal resources. Roughly 54% of primary energy is derived from geothermal sources (Orkustofnun et al , 2007). The Icelandic government has encouraged geothermal exploration and research for many decades. New and effective exploration techniques have been developed to find geothermal resources. The Iceland Deep Drilling Project (IDDP) now expects to drill and test a series of boreholes that could enable a ten-fold increase in power output relative to conventional wells. The University of Iceland and Reykjavík University are the leaders in geothermal research. Two recently established schools, the Renewable Energy School (RES) in Akureyri and Reykjavík Energy Graduate School of Sustainable Systems (REYST), are focusing on postgraduate studies in renewable energy. The United Nations University-Geothermal Training Programme (UNU-GTP) has been operating in Iceland since 1979 and started a M.Sc. program in 2000.

Three main energy companies and about 200 smaller heating utilities operate in Iceland. Orkuveita Reykjavíkur (Reykjavík Energy) is the leading utility provider for the Reykjavík metropolitan area, covering 67% of the Icelandic population. HS Orka hf (Suðurnes Regional Heating) was a pioneer in building the cogeneration power plant at Svartsengi. Landsvirkjun (The National Power Company) is the country's main producer of electricity with eleven hydropower and two geothermal stations. Several Icelandic companies export geothermal and hydropower know-how and experience. Reykjavík Energy Invest (REI), Reykjavík Energy's international business development and investment arm, is a shareholder in Enex, a geothermal energy solution provider, and operates projects in Iceland, Europe, Africa and Asia. Geyser Green Energy (GGE) was founded in 2007 and is the sole shareholder of Icelandic Drilling Company, the world's largest geothermal specialist drilling firm. GGE also owns Exorka International, a specialist developer of low-temperature geothermal electricity generation (Kalina). REI and GGE jointly own Envent Holding, dedicated to the exploration of geothermal resources in the Philippines, and share a stake in Enex-China, building a significant district heating system in a large city in central China. GGE is also developing geothermal energy projects in California and British Columbia.

A significant number of **individual companies** in the Nordic countries have a strong focus on energy- and environment-related products and services. Among the 72 Nordic companies included on the 2008 Forbes list of leading global companies, ten are working with energy and environmental technologies. In renewable energy, companies like Vesta and Renewable Energy Corporation ASA (REC) are world leaders in their fields. 13 Nordic companies were included in Innovest Strategic Value Advisors 2008 Global 100 list of the most sustainable corporations.

Counts of ISO 14001:2004 certification show that Sweden registered 3800 out of the 154 572 certificates issued globally, the 9th largest number for any country. Compared to total population, the Nordic countries are above both the EU-15 and the OECD averages on these counts.

3.4 Overall assessment

In the field of energy and environment the Nordic countries have a **strong opportunity** to develop a global leadership position. Energy supply is overall stable and the Nordic countries have already made significant strides in using renewable sources of energy production. Environmental conditions are healthy. Significant knowledge on energy and environmental technologies exists in Nordic research institutions and companies. And Nordic energy and environmental research is strongly engaged in international research activities. Eco industries play already a significant role in the Nordic economies, higher than in the economies of many EU peers. Individual clusters and companies have been able to achieve leading global positions in their respective fields of the energy and environment industry.

Despite these solid foundations, there are also **challenges** ahead.

- The strong position of the Nordic countries on renewable energy is to a large degree the result the specific natural energy sources available. With the naturally given capacity largely exploited, **future energy needs** will have to be met through technological advances or a shift towards new fields. And despite the significant use of renewable energy, there remains still enough to do for the Nordic countries to reach the Kyoto-protocol targets.
- The policy differences on a number of important policy issues, from the use of nuclear energy to the subsidies for biofuels, do not help. More **alignment of regulations** would enable the creation of a more integrated Nordic market for energy and environmental products, with benefits for competition and innovation.
- The Nordic position in knowledge production in the field of energy and environment is good but not outstanding. There are **few institutes with global visibility**, but a relatively high number of smaller universities and other research institutes. This could be a disadvantage as large international research institutions focus more on this field. Better coordination among the network of existing institutions would be a first important step to address this challenge.
- Individual clusters and companies from the Nordic region have a strong position in the energy and environmental market. But **market size** could again be an issue: As investors in the US and large continental European countries shift more

forcefully towards this market, individual Nordic countries will face a hard time to sustain their global visibility as market leaders.

4. The financial crisis and Nordic global competitiveness

The Nordic countries are as small open economies fully exposed to the current financial crisis that is now widely expected to turn into the most serious economic downturn since the depression. It is inevitable that a crisis of such proportions raises fundamental questions about the course of economic policy. How did the crisis develop? What is the impact on the Nordic countries? And what are the policy conclusions that can be drawn, for the short run as well as more long term?

These questions will be hotly debated for many years to come. The Barometer takes a limited view and asks about the lessons that can be drawn from looking at the crisis from the perspective of the conceptual framework the Globalizations Barometer is based upon: How much is this crisis related to the more general process of economic globalization? And what lessons can the framework of the Nordic Globalization Barometer with its focus on long-term supply-side foundations of economic growth provide in the current short-term demand-side crisis?

The section is organized into three parts: The first part provides an overview structure that describes how the crisis unfolded. The second part uses this structure to look at the transmission channels for the impact of the crisis on the Nordic countries. The third part then provides observations on how the crisis affects the view of globalization, the assessment of the Nordic countries' position in the global economy, and the policy reactions now under discussion.

4.1 Anatomy of the crisis

Economists are traditionally much better in explaining the last crisis than identifying the next one. This remains true even when some analysts have for the last few years warned of an impending crisis, either because they have been always taking the pessimistic position or they really were more clear-sighted than many others.

But whether or not individual analysts were right is less important than understanding what dynamics led to the dramatic outlook the world economy is now facing. An analysis of the anatomy of the crisis is crucial to inform policy reactions that address the current problems, and hopefully avoid their repetition without inflicting unnecessary collateral damage on the economy.

Antecedents of the crisis

Financial crisis are nothing new. They have been around many times, in countries of all stages of economic development (Reinhart/Rogoff, 2008; Ferguson, 2008). But no two crises are completely alike and to draw conclusions it is necessary to disentangle the different factors that have been important in the current crisis. This time around, the crisis is truly global and of a sheer ferocity previously unknown. Many of the elements that contributed to the outbreak of crisis have been present in other situations before, but their particular mix and interaction is unique:

- **Financial bubbles.** The tendency of financial markets to develop ‘bubbles’, i.e. the deviation of prices for risks and financial assets from their fundamental values has long been known (Shiller, 2005). Especially in longer periods of solid growth there is a tendency for asset prices to rise as expectations of future growth are rising. The price of risk is at the same time falling, as the likelihood of negative shocks is increasingly discounted while the memory of their last occurrence fades away and new generations of executives enter the industry. This is related to two separate ways one can look at the valuation of financial assets: The fundamental approach is to define the value of the asset as the expected discounted future value of all payments associated with it. The market approach is to define the value of the asset as the price that aligns demand and supply for the asset. The two approaches deliver the same valuation in equilibrium but can diverge if, for example, demand is influenced by the (irrational) expectation of future asset price increases not supported by the payment stream associated with the asset.
- **Regulation.** Changes in the policy and regulatory environment of the financial system over the last few years were a second key driver (Blundell-Wignall et al. 2008). In 2004, the US government started to push for new ways to open the mortgages market for lower income families while imposing more restrictions on the government-owned

entities that traditionally dominated this market. Commercial banks move more aggressively into the market for securitized sub-prime mortgages. In the same year, the Basel II accord (Tarullo, 2008) provided a path towards international banking regulations that put more weight on banks internal risk assessment systems when calculating capital requirements. During this period there were also changes in accounting practices, especially the valuation of assets according to current market value that ended up affecting banks' behavior. Overall, these changes increased the attractiveness of off-balance sheet assets and securitized mortgages and pushed a larger share of financial market activity outside the traditional purview of regulators. It also created new systemic risks that were poorly understood and regulated.

- **Globalization.** The significant increase in global trade and financial flows was a third important factor, both through the direct changes on global financial markets and the more indirect changes through financial implications of the newly emerging economic structures in the global economy. The opening and integration of financial markets globally created much more opportunities for moving capital around (Abdelal, 2007) but also much more competition among financial institutions. The growth of cross-border trade and investment created a large pool of capital to be channeled from countries with high capital account surpluses, like China, to countries with capital account deficits, like the U.S. The willingness of emerging economies to run high surpluses had been heightened by the experience of the last crisis they experienced, where current account deficits had been a core trigger.

These three factors have clearly also interacted. A key factor was the interaction of the traditional cyclical 'boom' dynamics and globalization on monetary policy: If globalization really provided a new economic environment with higher potential growth rates at low inflation, the increase in financial market prices and the overall size of the financial services industry was nothing to worry about. It reflected the transition to a new equilibrium with higher asset prices and more financial intermediation. If traditional "boom" economics were the driver, the developments on financial markets were much more worrying. In the event, US monetary policy took the view that structural changes due to globalization were important and allowed asset prices to grow. As long as inflation remained low, widely seen as the result of Chinese competition that was reducing pricing power of suppliers, the rise in asset prices and the creation of liquidity was not seen as much of a problem. While the Federal Reserve took this sanguine view, government deficits started to accumulate and the private sector savings rate dropped as consumers cashed in the value of their rising housing assets to finance consumption.

Overall, the combination of a traditional overheating cycle, the interplay of a number of well-intentioned policy changes, and the structural changes in the global economy created a situation in which a normal banking crisis could turn into one of the most serious economy crisis of this generation.

The transformation of the financial services industry

The combination of a growing and rapidly more global economy, accommodating monetary policy in the US but other countries as well, and changes in the regulatory environment provided an environment in which the financial services industry thrived.

In many countries, the size of the financial services industry in total GDP grew and relative wages of this sector advanced faster than elsewhere in the economy. The balance sheet of financial institutions grew at a high rate, much higher than the growth of GDP. Off-balance sheet activities, too, proliferated. Non-banks, for example insurance companies, moved into the field as well, creating a rapidly growing market for insuring the default risk of the new financial instruments without being under the regulatory supervision of the financial industry. Trading volumes increased rapidly and the liquidity of capital markets seemed almost unlimited. The size of transactions that could be financed through the markets moved from one record to the next. And the global linkages between national capital markets became increasingly stronger (Farrell et al., 2008). It was increasingly unclear, whether the strong growth of the financial services industry reflected the better global allocation of capital it enabled, or the growing systemic risks that were building up underneath.

The growth of the financial services industry was made possible by the fundamental changes in the global economy. But it was then ultimately driven by pressure on banks to deliver higher returns, both to their owners and to the investors that entrusted them with their capital. A more global financial market with more choice had increased the pressure to be among the most profitable institutions to gain or just defend market position. It had also reduced the interest spread between banks' liabilities and assets, traditionally their key source of income. The only way to satisfy the demands of investors for higher returns was to increasingly use leveraged instruments that translated moderate price changes in underlying assets into much larger price changes of the derivative created. And the only way to satisfy owners' demands for higher profitability in an increasingly competitive market was to move from a low-growth assets-based banking model based on the interest rate spread between assets and liabilities to a **transaction-based banking model** based on trading and fees for service. Banks became increasingly efficient in maximizing the level of risk they could take on given their own capital. Banks also had a huge incentive to originate financial assets, a business that both generated attractive fees and could be packaged with well paid advice to clients. In the process, lower quality assets were sold on secondary markets (Berndt/Gupta, 2008), often, as it turned out, with limited understanding of the underlying risks involved.

As the financial services industry changed its operating model, a number of new **financial products** rose to prominence. Hedge funds appeared that could mobilize large amounts of capital to exploit any perceived mispricing of assets or arbitrage opportunity. Credit Default Swaps (CDS), a lightly regulated bet against the default of a creditor, turned from an exotic instrument to a market covering a notional value of more than \$50trillion of debt by 2008 (Fender et al., 2008). Currency carry

trade, in essence a bet on interest rate differentials between currencies, became a large business, pushing narrow currencies like the Hungarian Forint and the Icelandic Krona to record heights. Trading volumes for these small currencies vastly exceeded the currency needs related to trade or long-term financing, raising the risk of a currency crisis. Asset-backed securities, including those based on sub-prime mortgages, became a widely used asset class and were traded much more widely than before. With investors more than willing to buy these assets, mortgages were offered at increasingly favorable rates. At the most extreme, negative own capital mortgages financed a property plus provided an upfront payout on the assumption that mortgage payments would be covered through rising property values and default rates would stay at historically low levels. The mortgage industry had changed from an originate-to-hold to an originate-to-distribute model, with the risks of assets getting increasingly less transparent to the buyers of securitized groups of claims and derivatives based on them (Barth et al., 2009).

A number of mechanisms are needed to ensure that competition leads to innovation and value creation that has social and not just individual benefits. Internally, **governance mechanisms** should align individual compensation with the risk-adjusted value created for the bank. Externally, rating agencies should create the information that gives banks the incentives to behave in the interest of their shareholders. And regulators should provide the rules that ensure that banks do not take undue risks on behalf of either the depositors or the wider public. With hindsight, all three mechanisms provided inadequate guidance to steer the financial services industry into a more sustainable direction. Internal control mechanisms in effect pushed towards higher risk taking, especially in ways that did not seem to require own capital. Rating agencies had trouble to accurately incorporate the systemic risk that banks' were exposed to and contributed to. Regulation failed to keep pace with the innovative new financial products that were brought to market. Changes that came into effect after the Enron-scandal increased bureaucracy that only reinforced the view that self-regulation was better able to support an effective financial industry.

Overall, the financial services industry was put in a position of much stronger dynamism but with inadequate regulatory context to turn this dynamism into a force for value creation instead of risk taking.

The crisis unfolds

The evolution of the actual crisis followed in the initial stages the usual sequence of past financial market disruptions. Over time, however, the new context in which the crisis unfolded multiplied the consequences

After many years of strong growth, the global economy was increasingly showing signs of supply-side constraints. Prices for natural resources and food were starting to grow at an ever faster rate, as the growing emerging economies were starting to become significant buyers alongside the OECD countries. Wages in China and other emerging economies were rising and advanced economies around the globe were starting to experience skill shortages.

The first casualty was the **U.S. housing market**. Inflation rates started to move up as the World Economy was facing rising costs and Central Banks, in particular the Federal Reserve, raised interest rates during 2005 and the first half of 2006. The U.S. housing market initially continued to register rising prices but the peak was reached in the second quarter of 2006. Soon default rates started to rise, especially in the sub-prime market where financing was dependent on low interest rates and falling property prices quickly left customers with negative net values from the combination of mortgage and property.

From the housing market the problems moved to **financial institutions**. The initial casualties were the financial institutions with exposure to the US subprime market. Next were real estate-oriented institutions more generally that saw their valuations drop. Institutions that owned other types of asset-backed securities followed. During 2007, what had started as a problem in some distinct markets turned into a systemic problem. The new financial instruments used to trade risk had created a large amount of uncertainty about the actual exposure of individual financial institutions to the risks originating from the housing market. Bank balance sheets started to deteriorate as the value of their assets plunged, driving them to raise new capital or unwind positions. The willingness to give credit to other financial institutions eroded at a dramatic rate. Liquidity in the markets dried up rapidly. And the public got increasingly concerned about the ability of banks to meet their obligations, with the UK experiencing a historic bank run on Northern Rock in September 2007.

By early 2008, the situation had deteriorated further, affecting wider and wider segments of the financial services industry. In March, Bear Stearns became the first high profile casualty of the crisis: Its leverage ratio of 35:1 (\$11bn in equity supporting \$395bn in assets) was high even for Wall Street standards. Investors fled the bank's shares and counterparties were unwilling to trade with them, questioning their ability to finance transactions. JP Morgan acquired the bank with the support of the Federal Reserve. During the summer, many banks tried to shore up their balance sheets by raising new capital from outside investors. **Lehman Brothers** had announced a new investor in August but when the deal fell through, the bank filed for bankruptcy on September 15th. This time the US government decided against supporting an arranged merger with another firm. In the aftermath of this watershed event, the remaining US investment banks either fled into mergers with large banking groups or applied for normal banking licenses, putting them under stricter regulatory oversight. Banks in a number of other countries had to be rescued. Glitnir in Iceland was nationalized in late September and soon after the majority of Iceland's banking industry was put into receivership.

As the crisis in the financial services industry unfolded, other companies, too, started to suffer. Initially hit were investors that had created highly leveraged positions, using their assets as securities to finance further acquisitions. With refinancing getting harder, investment positions had to be liquidated putting further pressure on stock markets that were already jittery about the problems in the banking industry. Stock markets started to slide from October/November 2007, first at a moderate but later at an accelerating rate. After the collapse of Lehman Brothers in Septem-

ber 2008, the downturn became visible in a broader set of economic indicators beyond share prices. The financial crisis turned into an **economic downturn**. A number of forces worked in that direction:

- The direct effect of a slowing construction industry suffering from the collapse of the housing market
- The increasing constraints companies and consumers faced in getting credit from the banking system (Ivashina/Scharfstein, 2008)
- The wealth effect on consumers that had seen the value of their houses and stock market savings deteriorate
- As these problems started to materialize, rising unemployment and worsening expectations of businesses and consumers further multiplied the downward trend of economic activity

Initially, there was some hope that the **emerging economies** would be able to provide some stability in the global economy. But soon it became clear that they, too, would be highly affected by the crisis. The Icelandic government, faced with the liabilities of a collapsed banking system many times the size of the country's GDP, had to rely on foreign help from the Nordic countries and the IMF to stabilize its financial system. Countries highly dependent on external financing required official help and soon the IMF was called in to provide rescue financing in the Ukraine, Pakistan, Hungary, and Latvia. In Russia, the newly emerging financial sector was already suffering as highly leveraged investment positions had to be unwinded and foreign investors left during the Georgia crisis of August 2008. As the oil price dropped from its peak of around \$150 in July 2008 throughout the second half of 2008 and early 2009, the Russian rouble started to come under increasing pressure and GDP growth slumped. Even China was faced with the quickly collapsing US demand for its export growth, facing rising unemployment in the export zones around Hong Kong and Shanghai.

Governments reacted with an unprecedented range of **policy measures**, covering all areas of monetary and fiscal policy, a process that is still under way. Governments took equity and majority ownership positions in financial institutions, central banks slashed interest rates and got involved much more directly in providing credit to industrial companies, and finance ministries announced massive spending programs to counter the loss of private and company demand.

Overall, the transmission of a bursting bubble in parts of the financial system to other parts of the financial system and then to the real economy has never before happened so quickly, reached such a dimension, and affected such a large part of the global economy. The financial system has become more important and more capable to support economic growth. But while its growing complexity has enabled it to deal better with more localized shocks (volatility in markets had gone down prior to the crisis), it has increased the danger of a systemic shut-down in reaction to a broader based crisis.

A bleak outlook

Most international economic forecasts suggest a sharp contraction of economic activity in 2009, followed by at best low positive growth in 2010 (EU, 2009; IMF, 2009a; IMF, 2008f). The historical experience suggests that it will take a few years to work through the crisis, and that the costs will be high, in lost prosperity as well as in rising levels of government debt (Reinhardt/Rogoff, 2008c). Some support will eventually come from spending as consumers and companies resume buying durable goods like cars. Buying a car can easily be deferred by some time but only few will decide to stop buying cars altogether. But there is also further trouble to hit as the repercussions of the crisis work their way through the economy. Falling tax revenues and rising unemployment spending will but increasing pressure on public balances, further spooking financial markets and testing the confidence of consumers/tax payers. There is also a concern that the debt financing of the announced huge stimulus packages in the US and other large OECD countries will make it harder for developing and emerging economies to raise capital. This could limit their growth potential even further.

Much depends on how **economic sentiments** are going to develop in reaction to the governments' actions in view of the crisis: If consumers and investors start to gain confidence that this measures will be effective, this can become a self-fulfilling prophecy. But if they don't, the same will be true. There is no simple relationship between the size of a government's spending package and the likelihood of a positive effect on economic sentiment. Too small, and the direct economic effects will be seen as too meager to warrant becoming more optimistic. Too large, and the direct effects can easily be outweighed by consumers spending less in expectation of future tax hikes to finance the spending (Barro, 1974) or the deep downturn that the government signals it is expecting.

In small open economies, a significant share of the induced demand effect will also dissipate in the form of higher imports. In the US, this effect is smaller than in most other countries given the size of the economy. The highly protectionist 'Buy American' provision in the Stimulus package currently discussed aims to limit this slippage further. But the costs of such provisions are high and their effectiveness in saving domestic costs highly dubious (Hufbauer/Schott, 2009).

A significant challenge that differentiates this crisis from its predecessors is the lack of an obvious locomotive to trigger growth in the global economy. With the downturn affecting many economies at the same time, the old model of devaluation to kick-start export growth is not feasible on any meaningful scale. A rush to bail-out national industries, potentially in combination with protectionist measures, is more likely to be tried as an attempt to achieve a similar outcome. But there is all reason to believe that these efforts will only worsen the crisis by undermining the productive potential of the global economy and burdening public finances even more.

4.2 The Nordic countries in the global crisis

As many parts of the global economy, the Nordic countries have over the last three years turned from outside observers to full-scale participants of the crisis. This section provides a snap shot of how the Nordic region was affected.

The Nordic countries before the onslaught of the crisis

Over the last few years before the crisis, the Nordic countries had experienced strong economic growth. As was discussed in last year's Barometer, this strong performance was based on solid competitiveness and the full use of the opportunities that globalization has to offer to **small open economies**. All Nordic countries had opened up to global trade and investment in similar ways. All except Iceland had run current account surpluses over the last few years. While all had fully convertible currencies (Finland as part of the Euro-zone), they differed in their foreign exchange arrangements which would play a role in how the crisis played out.

As in the US, the Nordic countries were in the run-up to the crisis showing increasing signs of approaching the height of the **business cycle**. Unemployment rates were falling, house prices rising, and consumer credit was growing fast. In Iceland, all of these effects were the most pronounced. In addition, many consumers started to take out loans in other currencies, especially Euro, in the expectation of a further rising Icelandic Krona. Across the Nordic countries, consumers' savings rate outside of the compulsory pension system fell as they felt more optimistic about the future and wealthier through their housing and equity ownership. Inflation remained broadly in check before the outbreak of the crisis but was becoming an increasing concern for monetary policy. Fiscal policy was used anticyclical, and after 2004 all Nordic countries registered solid public sector surpluses. To prepare for the fiscal effects of an aging population, governments targeted public sector surpluses across a full cycle, not just during upturns.

The **financial system in the Nordic countries** had over the last decade gotten increasingly integrated (Wajid et al., 2007). The series of mergers that brought all Nordic exchanges under the roof of one company was one visible sign of this process. The Nordic Investment Bank (NIB), initially created in the mid-1970s by the Nordic governments to overcome the limitations of separated national financial markets, had shifted its operations increasingly to more traditional economic development roles. A small number of Nordic banking groups were active across the region, while banks from the outside the Nordics had little presence other than in investment banking and corporate markets. Foreign investors, however, held between 24% (Denmark) and 51% (Finland) of total equity market values on the national exchanges. Iceland, Sweden, and Finland had fairly concentrated banking market structures, while Norway and Denmark continued to have a large number of smaller regional banks. Denmark, Iceland, and Sweden had the largest financial sector relative to

the size of their economies, and especially in Iceland the banks also accounted for a large share of market capitalization on the national stock exchange. Swedish banks had become dominant players in the Baltic countries. This contributed strongly to their profitability before the financial crisis but was starting to become a concern later on. Icelandic banks had since 1998 aggressively internationalized to the UK and Continental Europe but also some of the other Nordic countries. Otherwise Nordic banks had a relatively limited presence abroad.

An important experience that had shaped the Nordic banking industry outside of Iceland had been the **Nordic banking crisis of the early 1990s**. At the time, banks in Finland, Norway, and Sweden had gotten into a cycle of overly aggressive lending that ended in disaster as interest rates started to rise and credit losses mounted (Drees/Pazarbasioglu, 1998; Englund, 1999). Not unlike the current crisis, changes in the regulatory system – in the Nordic countries the deregulation of the banking industry – created the potential for a much more effective industry. But they also became the starting point of a path that ended in a costly crisis as banks used their new freedom to embark on behavior that ultimately undermined the financial system. Despite its significant macroeconomic costs, the way that the crisis was managed has with hindsight been seen as a model for other countries. Especially the use of a ‘bad bank’ to isolate so-called toxic assets and enable new lending by the banking industry turned out to work well (Bergstråm et al., 2002).

Partly because of the crisis experience, there was a clear focus on the sound financing of banks. Central banks in the region conducted regular ‘stress-testing’, i.e. analyses of whether the banks’ capital structures could withstand certain external shocks and found little reason to question the **solidity of the Nordic financial system**. These positive assessments continued to hold even after the financial crisis had struck (Danmarks Nationalbank, 2008; Norges Bank, 2008; Riksbanken, 2008a).

The Nordic countries getting entangled in the crisis

As the financial crisis started to unfold, effects on the Nordic countries were initially limited. There was **little direct exposure** to the subprime mortgage market, unlike among the more globally oriented banks in the UK and Continental Europe. More of a concern was how to avoid running into the same problems in the housing sectors of the Nordic countries, where prices had gone up rapidly and where especially Denmark had one of Europe’s largest mortgage markets. But a combination of tightening monetary policy and the specific features of the Danish mortgage market that was quite different from the US were considered to offer a sufficient shield. Some cooling off to battle inflation in the housing market and elsewhere would be necessary, potentially even by quite restrictive monetary policy, but that was a known scenario.

When the financial sector felt the pain more widely during the second half of 2007, the crisis started to have more tangible effects for the Nordic countries as well. **Equity markets** started to fall, following the lead of US markets and reacting to the rising interest rates in the Nordic countries. The Swedish banks engaged in the Baltics also suffered as especially foreign investors got increasingly nervous about the potential for

economic crisis striking the Baltics and thus the Swedish banks' credit portfolio. And individual Nordic investors lost out, famously a number of Norwegian municipalities that had invested in complex derivatives based on the imploding US bond market. During 2008 the situation worsened. In August of 2008 a smaller Danish bank (Roskilde bank) had collapsed, dragged down as much by the contraction of the Danish housing market as the global financial crisis. The collapse of Lehman Brothers in September then resulted in rising skepticism about the liquidity of financial institutions in general. In most Nordic countries, the fall-out could be contained even when the workings of the financial system, especially the interbank lending, was severely impaired for some time.

In reaction to the deteriorating situation, the Nordic countries started to organize **policies to support the financial services industry**. To avert the immediate danger of bank runs, Denmark, Sweden, and Finland increased their deposit insurance schemes; Norway already had a much more extensive guarantee than other OECD countries (Schich, 2008). Sweden, Norway, and later on Denmark also offered direct guarantees and recapitalizing options to banks. While in the UK, Germany, Switzerland, and the Benelux countries governments had to recapitalize a number of large banks, nothing similar happened in Scandinavia and Finland. But while the collapse of banks could be averted by the promise of governments to step in, Nordic banks did not actually make use of the governments' offer and remained cautious about new lending. Governments had hoped to be able to push banks to resume lending in return for providing capital infusion or guarantees. But banks refused to participate to avoid negative reputation effects and the direct costs associated with such government support. The level of this cost was set under the EU Commission's competition rules and became a politically contentious issue.

In Iceland, the Lehman collapse very quickly led to the collapse of the main elements of the **Icelandic banking system**. Unlike their predecessors during the Nordic banking crisis that had suffered from deteriorating assets, i.e. credit portfolios, the Icelandic banks were facing problems on the liabilities side. Their balance sheets far outsized the size of the Icelandic economy and were increasingly denominated in Euro rather than Icelandic Krona. As the global credit markets dried out, so did the options for Icelandic banks to refinance these assets. When the risk premiums for refinancing Icelandic loans skyrocketed, Icelandic banks tried to attract more consumer deposits in Europe, offering high yields. But the amounts were insufficient to close the refinancing gap. This was not primarily a question of having too little own equity – most indications are that the Icelandic banks did not look especially vulnerable compared to their Nordic or other international peers on this measure. Own equity and the capital ratios laid down in the Basel II regulations provide a buffer against losses on large assets, not against a shutdown of refinancing markets. In such instances, only a lender of last resort can provide the assurances a bank's counterparties are looking for. For Icelandic banks, however, no credible lender of last resort was available. The Central Bank could not 'create' the Euros the Icelandic banks needed and the Ministry of Finance did not have the resources to back the banks' assets that had grown to many times the Icelandic GDP (Buiter/Siebert, 2008b). The

collapse was then a matter of time (Buitert/Siebert, 2008a) even when individual policy mistakes contributed to the way the collapse of the Icelandic banks unfolded in October/November 2008 (Portes, 2008). The general revision of attitudes towards risks also affected **currency exchange rates** which differential results across the Nordic region. Finland was as part of the Euro-zone unaffected. Sweden and Norway, targeting inflation rather than a stable exchange rate through their monetary policies, experienced significant devaluation against the Euro and the US-Dollar, as investors fled to the perceived safe havens of larger currency areas and Norway registered lower oil revenues. Denmark was stuck in between, having to raise interest rates in October to defend a stable relation to the Euro in the ERM 2 when other countries lowered rates. By the end of 2008, Danish interest rates had come down as well. In Iceland, the aggressive lending in foreign currency had dramatic consequences as the Icelandic Krona was dragged down with the banking sector. Many Icelanders were stuck with exploding credit liabilities on their foreign currency loans. The increasing focus on exchange rate risk also had indirect effects: the threat of devaluation in Estonia and Latvia further increased the concerns about Swedish banks' credit portfolios in these countries.

In the **non-financial sector**, the Nordic countries high integration into the world economy and deteriorating consumer and company expectations at home led to significant ripple-on effects as the global economy turned into recession (Nordic Council of Ministers, 2008). Across the Nordic region, the construction sector faced a serious downturn after years of high growth. In Sweden, the automotive industry was faced with rapidly imploding demand and US owners facing the threat of bankruptcy. In December 2008, the Swedish government offered automotive companies loans and loan-guarantees of €2.4bn. In Norway, the collapsing oil price led to significant cut-downs in the investment plans of the oil industry and reduced the revenues accruing to the Petroleum Fund. In Norway and Denmark, the shipping industry was facing a shrinking world trade and a dramatic fall of shipping rates. Unemployment started to rise quickly across the region towards the end of 2008. All Nordic countries announced measures to increase government spending to make up for lost foreign and domestic demand. Additional expansionary effects would come from the automatic stabilizers, i.e. rising unemployment benefits and falling tax payments. Monetary policy contributed in all Nordic countries through repeated interest rate cuts.

Looking ahead

The **short term** outlook for the Nordic countries, i.e. for the coming few months before current government policy decisions will have their full effect, is as bleak as for the rest of the global economy (European Commission, 2009). The global collapse of demand affects economies almost independently of their competitive strength. And as countries highly integrated with the global economy, the disproportionate fall in exports relative to domestic consumer demand will take an extra toll.

In the **medium term**, i. e. as the economy is on the adjustment to a new equilibrium, the Nordic countries face the balance of two different effects. On the one hand, the solid fiscal policies of the last few years

have created ample ammunition for governments to spend and prop up demand. On the other hand, the relatively generous social security systems and high tax rates can lead to a quickly deteriorating fiscal position of the public sector. And labor markets that are more flexible than sometimes assumed can translate the crisis into rising unemployment faster than in some Continental European countries (Rae/Sollie, 2007).

If public **spending programs** work quickly enough, the full impact of the downturn on government balances might be limited. If they do not, the governments' ability to finance such efforts will be increasingly constrained by rising public deficits. As in other countries, much will depend on consumers' perceptions about whether or not the governments are taking the right steps to get the crisis under control. And these perceptions might not rise unilaterally with the size of the spending package, especially given the public opinion in recent years that strongly supported government budget surpluses. Instead, it is likely that the public will critically test whether spending is focused on areas that have longer term benefits to competitiveness and prosperity. There is some indication that the interest rate cuts by Nordic central banks have helped stabilize the demand for housing. Country size also matters, alongside expectations: In small open economies like the Nordic countries, the fiscal costs of a stimulus package are national while much of the demand effect dissipates across borders through higher import demand. While less important for the US economy, it is a serious concern in the Nordics.

In the **longer term**, i.e. when global demand and supply have readjusted, the underlying supply-side competitiveness of economies will again matter most. The Nordic countries are in a strong position in this respect, as chapter 1 of this Barometer again confirmed. It will be crucial to retain and, where possible, strengthen these advantages during the crisis. This is not so much a problem in public infrastructure and other areas directly driven by government spending. It can be a real challenge, however, where it involves companies that might go bankrupt or are forced to cut down on R&D and other investments as a lack of cash-flow and credit leaves no other options. One of the most critical issues will be whether economies are able to resume creating jobs relatively quickly. If that succeeds, private consumption is more likely to stabilize and the burden on public budgets will then remain more manageable. Last year's Barometer provided evidence that the Nordic countries are reasonable well positioned in terms of their actual ability to allocate labor and capital into new activities. Keeping and where necessary improving this capability for change will be one of the critical challenges for economic policy and the labor market partners in the years to come.

If history is any guide, the **adjustment to normality** will take a number of years, even if growth should start to resume already sometime in 2010. And it will have significant costs, especially on government finances (Reinhart/Rogoff, 2008c). But the Nordic countries have gotten through crises before, not only the banking crisis of the early 1990s but in Finland's case also the reorientation of trade relations from the East to the West at the same time. Finland turned the deep and painful crisis into an opportunity to build a new competitive model that propelled the country to strong prosperity improvements in the years to follow. Getting through

the current crisis in a similar fashion will in many ways be even more challenging. But the Finnish example is an inspiration that determined policy action can achieve just that.

4.3 Globalization, competitiveness, and the financial crisis

The current economic crisis has raised many **fundamental questions** about the functioning of financial markets, the appropriate level and nature of regulation, and about how to best react to the systemic breakdown of the financial markets and the drastic fall in global demand. Addressing these questions goes far beyond the scope of this Barometer and their discussion will likely be with us for a number of years at least. This section instead looks at three more narrow questions that arise when looking at the crisis from the perspective of the Nordic globalization debate.

Has globalization contributed to the crisis?

The discussion earlier in this chapter suggests that globalization has been an important element in the overall context in which the financial crisis has evolved:

- **Globalization was not the cause of the financial crisis.** Other factors, in particular the natural tendency for financial bubbles to emerge in combination with changes in the regulatory and market environment of the financial services industry, were much more central. But the globalization of trade resulted in significant trade imbalances that left a large amount of capital looking for high returns. And the globalization of capital markets provided the channels through which this capital could fuel the change process under way in US financial markets that had been unleashed by largely domestic policy changes. Many other countries as involved in global financial markets did not develop the same kind of problems as occurred in the US mortgage market.
- **Globalization was not the reason that the mortgage crisis turned into a systemic crisis of the financial system.** The emergence of new, often poorly regulated financial instruments was much more critical. It translated the actual losses in one market segment into a crisis of confidence that quickly affected almost all financial market segments. But the perception of unlimited liquidity in deep global financial markets had contributed to the larger reliance on leverage and outside financing, in which the clarity about the clear allocation of ultimate risk had become increasingly blurred. And, in cases like Iceland, it had also increased the opportunities for banks to move beyond their own shores and grow businesses in other currency areas where they had more limited access to the Central Bank as a lender of last resort.
- **Globalization was not the reason that the financial crisis sparked a deep recession.** The transmission mechanisms between the finan-

cial sector and the rest of the economy have been deepening in many countries over the last few decades. But the increased level of global trade and investment flows has increased the contagion effect of a downturn in the United States and then Europe on other markets, including emerging economies like China. While the role of these emerging economies has grown significantly and their domestic markets have become much more important, the experience of the last few months has shown that globalization has not led to their “de-coupling” from economic conditions in the OECD.

The introduction to last year’s Barometer already suggested that unfettered financial globalization was the most controversial aspect of the globalization debate. Financial market crisis had become more numerous and powerful in the last few decades compared to the pre-war era of globalization (Eichengreen/Bordo, 2002). Assessments before the current crisis had pointed towards clear net-benefits of higher growth but also higher risks in larger global financial markets (Rancier et al. 2006). Because of the higher potential for market failure in financial markets, the argument for sequenced and more measured removal of barriers for cross-border financial activities was in any case much more grounded in academic research than arguments for restrictions in trade flows. But while in the past the cross-border financial linkages had been seen as the possible source of a problem, they now became the channel through which a largely US-based financial crisis affected the financial systems of many other countries.

While the globalization of financial markets without an adequate regulatory structure played a role in the way the current crisis has unfolded, the globalization of trade, direct investment, and value chains has been much less implicated. Higher ‘real’ economic integration has increased the number of countries wound up in the global recession; that is the reason China is suffering as well despite not being directly affected by the meltdown of US financial markets. But reducing real economic integration would make things even worse and the downturn more pronounced.

Overall, globalization – as financial liberalization – provides huge benefits but also raises the risks that shocks might occur and have an impact far away from where they initially hit (Wolf, 2008). For the broader set of changes associated with globalization the **balance of benefits and costs** is more likely to be positive, and can be made even more so with appropriate policy choices. For global financial integration, the current crisis is a reminder that the balance is more fragile. But even for financial integration it is crucial not to forget the huge benefits especially emerging economies have derived from capital inflows via private sector financial markets over the last few years.

Competitiveness is needed to succeed in globalization but is it relevant to combat the financial crisis?

Last year’s edition of the Barometer, and again chapter one of this year’s edition, have focused on the positive link between competitiveness and globalization: The more competitive an economy is, the more likely it is

to succeed in global competition and draw significant prosperity benefits from globalization.

Higher competitiveness, essentially a statement about the supply side of the economy, does not shield a country from the impact of a global recession, primarily a demand side problem. But there are a number of reasons why higher competitiveness is likely to enable a country to deal better with the consequences of the crisis:

- **More competitive economies have more solid fiscal and monetary policies.** Solid fiscal and monetary policies reduce the risks of a crisis hitting a country, and provide crucial ammunition for reactive measures once the downturn is starting to affect the economy. This is an important advantage for the Nordic countries that have all pursued solid macroeconomic policies in the recent past.
- **More competitive economies have companies that are better able to succeed in global competition.** High competitiveness provides a solid base for exports that can generate a foundation of capital inflows to stabilize an economy. This is particularly important for a country like Iceland which has a solid export business in non-financial services activities. The revenues from these activities will play a crucial role in sustaining and rebuilding the Icelandic economy. It also important for the other Nordic countries that, however, are anyway facing no dangerous shortfall in capital inflows.
- **More competitive economies are more flexible and offer more opportunities for innovation and the creation of new ventures.** Flexibility and openness enable economies to quickly react to the demands of a new economic situation and the opportunities it provides. It also reduces the danger of a crisis leaving a legacy of long-term unemployment with its associated costs to prosperity and public budgets. The Nordic economies have some aspects that indicate flexibility based on collective risk sharing (Andersen et al., 2007); the Danish labor market has become a global model in this respect. But other aspects, like the relatively low rate of entrepreneurship reported in last year's Barometer, also point towards challenges.

While competitiveness has an impact on the way economies are affected by the global economic crisis, it also provides some **guidance on important policy choices** that countries are facing now. Government spending programs are a crucial part of the policy response to the impending deep recession. As private sector demand vanishes in expectation of harsher economic times, government demand can make up some of the gap and, maybe ultimately more importantly, help to improve the private sector's outlook on the future. Especially for this second effect not only the size but also the profile of governments' spending measures is important. Countries with a clear competitiveness strategy will have a much better guidance for how to deploy spending in a way that contributes to long-term prosperity (Porter, 2008). And through such efforts with long-term benefits they will find it much easier to reestablish the confidence of the private sector.

Policy will react also in other ways to the crisis. In the shorter term, this might involve measures to avoid the collapse of companies or entire industries. In the longer term, it will extend to the design of a new regulatory framework for the financial sector. Competitiveness provides a framework for assessing the different alternatives that policy makers face in these areas. Policies that will lead to lower productivity, for example resorting to protectionist measures now or closing the door on financial market innovation in the future, are hardly the right way to react to the crisis (Buiters, 2008). But other measures are necessary and the competitiveness approach can help in choosing ones that are more effective in a longer-term perspective.

Overall, competitiveness has become more important, not less, as a consequence of the current crisis. The way back to a world before high levels of global economic integration where competitiveness across nations played less of a role is a way to poverty. But if globalization is the way towards a better economic future, the competitiveness framework is a crucial element to ensure policy choices that help reduce and manage the risks that globalization entails.

What are the lessons for the Nordic countries and their globalization strategy?

The Nordic countries were in the aftermath of last year's Nordic Globalization Forum described as "hot for globalization" (Peel, 2008). Public opinion had over the last few years at least in Sweden and Denmark moved more firmly towards a positive view of globalization, going against the trend observed in most other EU countries (European Foundation, 2008b). As small open economies, there is little other choice for the Nordic countries than to stay fully engaged in the global economy, even as the conditions get tough. The costs of falling back to rely on their own small markets is just prohibitive. But there are a number of lessons for how the globalization strategy of the Nordic countries might be calibrated in view of the recent experience:

- **Smaller economies face additional costs when combining an independent currency with full integration into global financial markets.** Macroeconomists have for some time discussed what they describe as the "trilemma", i.e. the inability to combine capital mobility with monetary policy independence and adherence to a nominal anchor like a fixed exchange rate (Obstfeld et al., 2003). The experience of the Nordic countries in the current crisis, exemplified by the forced Danish interest rate increases at the height of the crisis. Some analysts have gone so far as to question the sustainability of smaller national currencies in a global economy (Steil, 2007). This discussion is of more than theoretical importance. It essentially leads to a need to review whether the other Nordic countries would be better off to follow the Finnish example and join the Euro-zone. The, politically as well as economically complex, questions in this regard have been mulled over many times. They have to be reevaluated in the context

of much more powerful global financial markets and the heightened risks of systemic crisis. The Nordic countries already show evidence of a political response in this direction (Flam et al., 2009). More analysis is needed to support the political debate on this question.

- **More cross-border collaboration between financial regulators and central banks is needed.** If the risk of systemic crisis and spill-overs across national financial markets is rising, there is a need to react to this explicitly in the way the financial markets are governed. The experience of the Icelandic banking system suggests that the availability of a sufficiently potent lender of last resort is crucial; in the event, the size of the banking system, blown up by its huge foreign activities, was too large for the country to handle at a time of crisis. The time it took to then agree on a Nordic rescue package for Iceland (with Russia being suggested as an alternative in between) suggests that contingency arrangements between the Nordic central banks could help to react faster and maybe even avoid individual crisis altogether. A deeper review of how the changing nature of the financial markets needs to be reflected in regulatory structures will be needed.
- **An imbalance between economic and policy integration can reduce the ability to react in times of economic crisis.** Iceland and Norway have through their membership in the European Economic Area full access to the internal European market. Sweden and Denmark have as EU members full voting rights in the EU governance structures. Only Finland has as a member of the Euro-zone also a role in the governance structure of the European Central Bank (ECB). The crisis has exposed the different levels of influence these constellations provide. Iceland had no direct access to EU or ECB support and paid the price when it needed the shelter of a deep-pocket lender and a large currency area. What Icelandic politicians had in the period of market stability seen as a way to gain ‘access to all advantages of EU membership without the political costs’ became very costly in a time of crisis. Sweden and Denmark were party to the EU deliberations on a fiscal stimulus. But on monetary and banking policy they were effectively forced to react to decisions taken in the Euro-Zone. This is another reason to review the balance of costs and benefits inherent in EU and Euro-zone membership.
- **Flexibility, i.e. the ability to react to external shocks hitting the domestic economy, is a more important dimension of an economy’s globalization readiness than previously realized.** Last year’s Nordic Globalization Barometer introduced flexibility as a dimension of its assessment and its importance was emphasized through the events of the last twelve months. For policy, this indicates a higher focus on increasing the ability for labor and capital markets to react quickly to changed external conditions. It also suggests that the conditions for new business formation, a critical element of flexibility, need to get continued attention. For research, it will be important to provide a deeper analysis of risk and globalization: Globalization seems to increase the flexibility to deal with some type of shocks

(narrow, random) but might raise the likelihood and depths of others (systemic). Both a higher focus on increasing flexibility and more surveillance of possible indicators of the Nordic economies' vulnerability to different types of shocks needs to be considered.

- **Do not sacrifice open competition and globalization in an attempt to reduce the impact of the current or avert a future crisis.** Policy has to react flexible to a crisis of the current proportions. But while ideological concerns should not leave any options off the table, it is important to have a clear framework to evaluate and choose the best policy response. The Nordic countries' commitment to open markets and global competitiveness remains the right choice for them. Especially for Iceland, a country that in the eyes of many of its citizens has suffered at the hands of such a policy, it will be crucial to stay the course on these policies. The mistakes that were made in regulations and exchange rate policy have to be addressed. But these policies were the problem, not the competitiveness-oriented policies. Without them Iceland will not only be poorer but also stand a slim chance of regaining the prosperity lost. The Nordic region overall they will need to be active in the global economic debate to avoid suffering the collateral damage of protectionist policy choices in other countries that due to their size see an option to shift the costs of the crisis to other countries.

It will take a considerable amount of time for the implications of the current economic crisis to emerge. The nature of the globalization process might very well change, even though it is hard to imagine that the level of linkages reached in many spheres other than finance will (or could) be reduced significantly. Many of the choices that are now being made under the pressure of the financial crisis cannot wait for a more thorough assessment. Therefore it is important to already now start disentangling the **connections between globalization, competitiveness, and the dynamics in the financial markets** that triggered the crisis. The evidence available so far suggests that these are distinct areas, despite the clear linkages that exist. The failure in global financial markets was not at its core a failure of globalization. The financial market crisis does neither show that higher competitiveness raises financial vulnerability nor does it render competitiveness irrelevant. Globalization and higher competitiveness remain associated with higher levels of prosperity. But the conditions that enabled globalization and competitiveness in many countries to grow were apparently at least also consistent to the unsustainable dynamics that developed in financial markets. More clarity about the root causes is crucial to design policies that better manage financial markets without putting the brakes on globalization and competitiveness upgrading.

For the Nordic countries, the crisis raises a number of **specific challenges** related to their nature as small open economies operating (with the exception of Finland) small national currencies. As small open economies, they will have to prepare for global crisis and fight the tendency of large economies to resort to economic nationalism in the face of a downturn. As small currency areas, they will need to reevaluate the costs of staying outside the higher stability of larger currencies. Instinctive deci-

sions under the immediate impression of the crisis might not be the best for questions of such magnitude. But the crisis is a clear indication that the context has changed. And when the facts change, a reevaluation of old positions is not only prudent but necessary.

5. Conclusions

Writing a report on global competitiveness in the midst of the worst financial and economic crisis hitting the world economy since the great depression is a dangerous proposition. All discussions of short-term events are sure to be outdated by the time the report gets printed and read. All discussions of long-term issues, however, seem hopelessly irrelevant as decision makers struggle with the hard day-to-day business of crisis management.

In fact, taking the time to step back and evaluate the global competitiveness of the Nordic economies is a highly relevant and very timely exercise. In times of crisis, it is crucial to remain calm and evaluate the facts on their merits rather than follow general instincts that might be sufficient to guide behavior in easier times. It is now that real leadership is required and important choices with long term consequences have to be made. And it is important to consider these long-term consequences when reacting to the mounting short-term problems. If the Nordic Globalization Barometer makes some contribution to this end, it has more than achieved its purpose.

5.1 Key findings

The Nordic countries continue to do well in **global competitiveness**. The short-term changes in economic performance indicators until late 2008 were reflecting the late stage of the business cycle. Since then, the global crisis has started to show its impact. In terms of the fundamental position of the Nordic countries, the data does not change a structural change of direction relative to last year and medium-term trends.

The competitiveness and globalization readiness of the Nordic continue to be strong overall and can sustain the current level of economic performance. With the latest data collected in early 2008, the global financial crisis had much less of an impact on the data than the emerging bottlenecks at the height of the business cycle. Most competitiveness fundamentals are in any case changing only at a slow pace. In the short run the crisis could even ease pressure on scarce factor inputs while in the longer run it could erode competitiveness if reinvestments are cancelled.

The longer term competitiveness challenges faced by the Nordic countries have remained in place: The Nordic countries need to stay alert on sustaining their solid level of workforce skills, infrastructure, and capital availability. The eroding performance on science skills and patenting, two traditional strengths of the Nordic countries, remains a serious concern. The economic cost of current taxation patterns and other barriers faced by new entrants, already evident in the relatively low level of entrepreneurship, is likely to rise. The Nordic region continues to pay the

price for its lack of deeper market integration. The attraction and better use of foreign human capital remains high on the agenda. And the need for high flexibility in reacting to shocks has been dramatically emphasized by the current crisis. With these long-term challenges largely unchanged from last year, it will be important not to lose track of them as short-term demands of the crisis dominates the policy agenda.

The Nordic countries also register a solid position in **energy and environment**. Significant endowments with fossil as well as renewable energy sources have contributed to a high level of energy security in the region. Energy efficiency tends to be high after significant improvements over the last decade, although the situation differs somewhat across countries. The well developed renewable energy production is also highly consistent with the region's aspiration to be a global leader. Environmental conditions, too, are generally positive; another key condition of the region wants to position itself in this field. Reaching the ambitious goals on greenhouse gas emissions will nevertheless require strong efforts. Government policies have over the last few years put a wide range of instruments in play to fulfill their commitments in this direction.

There is significant evidence of research capabilities in energy and environment in the Nordic countries. Levels of patenting and publications are high, even though the measures of research spending do not indicate a particularly high focus on relevant R&D investments. Nordic research institutions are also active in international research collaboration on energy and environment and visible in global rankings of the field. The Nordic countries seem strong in particular segments, with different Nordic countries having specialized on areas aligned with their own energy mix and industrial capabilities. The absolute size of the Nordic science system remains moderate compared to the US and larger European countries that are getting increasingly active in this field.

The narrowly defined eco industry, companies that directly deal with reducing emissions or dealing with their consequences, is relatively large in the Nordic countries. Its absolute size, however, is moderate. Individual companies have achieved global leadership in specific segments, especially renewable energies. There is also some evidence that companies from the Nordic region pursue an environmental positioning strategy in many other economic sectors. This provides a huge economic potential but the competition in this area will clearly be intense.

The current **financial and economic crisis** has raised many fundamental questions about the function of markets and about globalization. A review of the crisis up to now suggests that a mix of traditional bubble dynamics and changes in the regulatory and economic environment planted the seeds of the crisis. The transformation of the financial services industry that occurred over the last decade in response to these changes then created the conditions for the current crisis to develop. Initially, the crisis followed traditional patterns. But there were two important differences that turned a normal banking crisis into a global recession: First, the new financial instruments that had emerge over the last decade created a widespread crisis of trust due to uncertainty about who held which risks. Second, the much higher level of global linkages that

has emerged over the last few years led to unprecedented global contagion of financial and economic effects.

The Nordic countries were initially less affected. But they were then hit with double intensity as the crisis turned global: As open economies, any global downturn would have a strong and direct effect on their export industries. As small currency areas (with the exception of Finland), they were suffering from the global flight to safety. Iceland was hit particularly hard because its banking sector had made a huge bet on the new financial model. In the course of this process, it had outgrown the rescue capabilities of both the Icelandic central bank and the ministry of finance. Failure was the result of the systemic shutdown of refinancing opportunities on the global market, not of reckless lending. But aggressive lending in foreign currency to domestic customers than contributed to the high social costs that the crisis exerts on Iceland.

Globalization and competitiveness are linked to the financial crisis, but they are not their root cause. Neither of them can isolate a country from the fall-out of the crisis. But both are necessary to regain growth. It will be crucial to design a policy response to the crisis that averts the risk of future financial crises while keeping the way open for globalization and competitiveness upgrading to proceed.

5.2 Key policy implications

The Nordic Globalization Barometer aims to identify policy areas important for the future success of the Nordic region in which collaboration on the Nordic level can make a significant difference. This creates a significant action agenda for Nordic collaboration. But it also leaves out crucial actions in all three areas address in this report, i.e. global competitiveness, energy and environment, and the financial crisis, that the Nordic countries can better address at the national level. Even in these areas, however, learning from the Nordic neighbors can play an important beneficial role.

In **global competitiveness**, the Nordic region cannot rest on its laurels. Competitiveness fundamentals are likely to become even more important when the current crisis has dissolved. The Nordic region needs to have these long-term considerations in mind when managing the short-term crisis:

- The Nordic region needs to retain its **key strengths**, especially on skills and research. These are areas in which Nordic collaboration could help. In skill upgrading, policy learning can be important. There is huge heterogeneity across the Nordic countries in this area which suggests that changes should be possible and could have significant effects. In research, important steps for the creation of a Nordic innovation region have been taken. But more could happen, not only in financing but also in market regulations that shape the demand for innovation.
- The Nordic region also needs not address some of its entrenched **weaknesses**, especially its low level of entrepreneurship and the low

intensity of domestic rivalry. These are areas in which Nordic collaboration can at least make a meaningful contribution, for example by forceful market integration that opens up new opportunities for entrants and rivals.

- The **Nordic model** also needs to be further developed:
 - There has long been a notion that the Nordic countries combine high levels of individual protection with a high level of flexibility at the level of the broader economy and society. This is an increasingly beneficial quality but the Nordic countries will need to review whether the mechanisms in play continue to fulfill this ambition
 - The Nordic countries have traditionally been very open and gained a large part of their prosperity through exports. With global engagement shifting to FDI and ultimately knowledge flows, the Nordic countries will need to review whether the current policies are sufficient to enable the region to benefit from the new types of economic linkages

In **energy and environment**, the Nordic region is facing a significant opportunity to position itself as a global leader in an area of large future growth. But the potential of these markets will attract many competitors, including countries that have much larger size and resources. The Nordic countries need to make sure that a combination of specialization and integration reduces its size disadvantage:

- The policy differences on a number of important policy issues, from the use of nuclear energy to the subsidies for biofuels, create confusion and limit the opportunities for new technologies in the region. More **alignment of regulations** would enable the creation of a more integrated Nordic market for energy and environmental products, with benefits for competition and innovation.
- The Nordic position in knowledge production in the field of energy and environment is good but not outstanding. There are **few institutes with global visibility**, but a relatively high number of smaller universities and other research institutes. This could be a disadvantage as large international research institutions focus more on this field. An integrated Nordic innovation area with specialization and open competition, including for the many new research programs in environmental technologies launched in the recent past, would create a valuable counterforce. Better collaboration within the network of existing institutions would be a first important step.
- Issues of energy-efficiency and environmental sustainability are cutting across **many sectors of the economy**. The Nordic countries can only move beyond a specialist position in renewable energy towards a more general positioning as an environmental leader, if there is clear focus on these issues across all sectors. The policy approach needs to broaden its perspective in this way and work with companies, maybe in cluster-specific platforms, on environmental strategies

for important sectors. A lot of activity in this direction exists already; more strategic integration could increase their effectiveness.

In the **response to the financial crisis**, the Nordic countries need to balance the short term requirements of averting a deep recession with the long-term needs of upgrading competitiveness. The experience suggests that the only trade-off between them is in terms of political action capability. If political leaders can remain engaged in both areas, it is likely that the two will have mutually beneficial effects:

- In the short term, maybe the most important task is to organize the **policy response to the crisis** in a way that does not undermine future competitiveness. Sustaining openness to global competition is crucial; this might be easier to see in the small open Nordic economies than in some of the larger OECD countries. Government spending to replace missing demand should at least in part focus on investments that lead to competitiveness upgrading.
- In the next stage, **efforts to avert a repetition of the crisis** will be on the agenda. Better coordination in regulating financial markets is an obvious task but will require collaboration beyond the Nordic countries. But some actions could be taken at the regional level:
 - The **surveillance of potential risks** (housing market, current account, sectoral exposure, currency) could become a regular feature of joint assessment of the Nordic economies. The Barometer could be one place to track this data; there might be more appropriate places to do so
 - The level of **preparedness for crisis management** that is coordinated across the region could be increased. While collaboration between the Nordic central banks and regulatory authorities is already at a high level, the Icelandic experience suggests that a publicly committed solution in place ex-ante could have huge benefits
- Finally, the Nordic countries will have to discuss whether the changes in the global **economy suggest more fundamental changes in their economic** policy architecture.
 - The balance of costs and benefits from operating an independent **currency** might have shifted. While both economically and politically complex, the question of membership in the Euro-zone should be discussed anew given the range of experiences in the Nordic region with different currency regimes.
 - The balance of costs and benefits from being outside the **political structures** governing the wider economic policy responses to a crisis also might have to be reconsidered. The debate about EU membership is already in process in Iceland. Whether it is the right answer remains to be seen. Not to be asking the question would be foolish given recent events.

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