

Draft National Risk Assessment 2016

Overview of Strategic Risks

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Overview of Strategic Risks

Foreword for the Draft National Risk Assessment 2016

A new Partnership Government has been formed to resolve some of the most pressing challenges facing the country.

This Government has pledged to address issues of public concern such as the housing shortage and improving our health system.

In doing so, we must ensure that Ireland's economic progress is sustained as it is a necessary condition for creating a more equal society.

As Ireland is a small island-nation exposed to global trends and forces, gains can quickly dissipate unless risks are openly acknowledged and addressed.

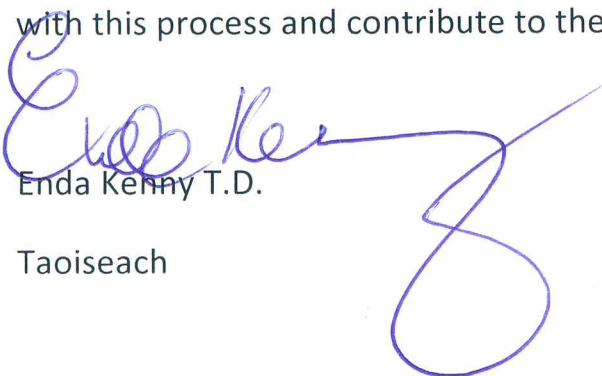
The National Risk Assessment has been developed by the Department of the Taoiseach as an annual process to identify the strategic risks which Ireland faces.

Some of the risks identified this year include uncertainty over the UK's relationship with the EU; weakening global economic growth and international terrorism.

Others are more domestic in nature including an under-supply of housing; infrastructural deficits; and expenditure pressures.

The Draft National Risk Assessment 2016 sets out these and other risks for public consultation. They are complex and demand a considered policy response. By being open about these risks, we hope we can have a mature debate about these challenges and their implications for Ireland.

I encourage everyone, both within the Dáil and the general public, to engage with this process and contribute to the debate about the future of our country.



Enda Kenny T.D.

Taoiseach

Contents

1. National Risk Assessment 2016: Overview of Strategic Risks	1
1.1 Introduction	1
1.2 Changes since 2015	2
1.3 Consultation and Next Steps	5
Potential Risks for Ireland in 2016	7
2. Economic Risks	8
2.1 Weak Global Economic Growth and Debt Sustainability	8
2.2 Loss of Competitiveness	10
2.3 Importance of multinational corporations to Irish economy and risk of unfavourable international tax changes	10
2.4 Vulnerabilities in the banking system	11
2.5 Turbulence in the Euro Area Debt Markets	12
2.6 Monetary Policy Uncertainties	13
3. Environmental Risks	15
3.1 Climate Change & Extreme Weather Events	15
3.2 Ensuring an affordable, sustainable and diverse energy supply	16
3.3 Food safety	17
3.4 Under-Supply of Housing	17
3.5 Infrastructural development	19
4. Geo-Political Risks	20
4.1 Brexit/Uncertainty over UK's relationship with EU	20
4.2 Devolution and related political developments in the UK	22
4.3 Risks to the stability of the EU through mass migration flows	22
4.4 Terrorist incidents and armed conflicts	23
4.5 Changing distribution of global influence and move away from a rules-based system	24
5. Social Risks	25
5.1 Long-term Exclusion from Employment	25
5.2 Human capital	26
5.3 Expenditure pressures	27
5.4 Changes in Dependency Ratio	28

5.5	Increases in Chronic Diseases	28
5.6	Social Cohesion and Political Stability	29
5.7	Migration and Integration	29
6.	Technological Risks	31
6.1	Cyber security	31
6.2	Major pandemics	32
6.3	Nuclear contamination	32
6.4	Technological trends	33
6.5	Anti-microbial resistance	34

Draft National Risk Assessment 2016: Overview of Strategic Risks

1.1 Introduction

In September 2013, the Government announced that, as part of its process of Dáil reform, it would publish annually a National Risk Assessment (NRA) for debate in the Dáil alongside a number of other documents.¹

The objective is to identify strategic risks that may arise due to potential changes in the economic, financial, geo-political, technological and social environments. In particular, the National Risk Assessment aims to stimulate and facilitate debate on these broader risks to future national well-being. As such it can be seen as part of the response to failures in the past to identify and address risks beyond a short time horizon.

This exercise is not intended to replicate or displace the detailed risk management that is already conducted within Government Departments and Agencies, or the work of the Office of Emergency Planning (OEP). Rather it aims to provide a systemic overview of strategic risks facing the country.

As in 2014 and 2015, the Department of the Taoiseach has prepared this preliminary analysis of high-level risks facing Ireland in collaboration with other Government Departments. These are categorised across five different headings: economic, environmental, geo-political, social and technological.² This draft is now being published for consultation in order to stimulate a broader conversation about the risks that Ireland faces and how they can best be addressed. Following that consultation process a final National Risk Assessment 2016 will be published.

¹ These include the Stability Programme Update and National Reform Programme which are presented to the EU Commission in April, the Spring Economic Statement produced by the Department of Finance and a National Progress Report published by the Central Statistics Office.

² This categorisation is derived from the various iterations of the World Economic Forum's *Global Risk Report* which can be found at [http://www.weforum.org/reports?filter\[type\]=Risks%20Reports](http://www.weforum.org/reports?filter[type]=Risks%20Reports)

1.2 Changes since 2015

The previous two iterations of the National Risk Assessment were snapshots of potential risks facing Ireland at a point in time. Since the NRA was last published in 2015, there have been many significant changes, both domestically and internationally.

With regard to the domestic economy, GDP increased by 7.8% in 2015 and GNP increased by 5.7%. This performance of the economy fed into a decline in the unemployment rate from 10% to 8.7% over the course of 2015.

Strong economic growth also had a beneficial effect on the fiscal position. Approximately €45.6bn was collected in taxes in 2015, which was €3.3bn ahead of target. All the major tax headings were higher in annual terms, reflecting increased levels of employment, consumption and business activity. The bulk of these above-profile tax receipts (70%) came from corporation tax which were €2.3bn. above profile. The Revenue Commissioners have advised that around 80% of corporation tax receipts are paid by large multinational companies and such companies accounted for a similar share of the increase in receipts in 2015.

The nature of this valuable revenue stream points to a previously-identified risk in relation to dependency on the multinational sector. Goods exports are characterised by a high reliance on multinational corporations and, in particular, by the chemical and pharmaceutical industries. The Irish economy is potentially vulnerable to relocation of such business activity elsewhere for a variety of reasons³ or to a downturn in particular business sectors on which Ireland is reliant. This could have a knock-on effect of lower exports, a fall in the number of high-quality jobs and a reduced tax-take both through corporation and income tax.

A more immediate domestic risk relates to housing. Last year's National Risk Assessment pointed to misalignments between demand and supply in the housing market. As a result of a lack of house-building and increasing demand, prices were rising rapidly. To ward off the possibility of a house-price spiral, the Central Bank introduced regulations which applied

³ These could be as varied as a lack of price competitiveness driving firms to lower cost jurisdictions, changes to the international tax environment or a lack of/loss of human capital. See Purdue, D. and Huang, H. (2016) *Irish Exports: The Facts, the Fictions and the Risks*. NTMA Economics.

proportionate limits to mortgage lending. Whilst these regulations appear to have moderated the rate at which house prices were increasing, continued under-supply of housing has led to a shortage of accommodation, particularly affordable accommodation, and consequential increases in rents and homelessness.

An improving economy also poses challenges in the provision of infrastructure. The National Risk Assessment 2015 noted that balanced economic growth and continued competitiveness is partly dependent on the timely provision of infrastructure in the right locations. Investment in necessary infrastructure declined during the recession and with the strong resumption of growth over the last few years, serious pressure points are emerging in a number of areas, particularly with regard to housing, transport and water infrastructure and services.

Stronger economic growth may also risk leading to expectations that restraints on public expenditure can be released, thanks to increased buoyancy of Government revenues. There may be insufficient appreciation of the vulnerability caused by Ireland's large stock of public debt. However, a new development is that, from 2016 onwards, Ireland is now subject to fiscal rules under the Preventive Arm of the Stability and Growth Pact (SGP) which are designed to ensure future expenditure will be sustainably financed and decoupled from dependence on cyclical or windfall tax revenues.

Apart from the domestic context, there have been several significant international developments which carry risks for Ireland. Given the openness of Ireland's economy, it is largely dependent on growth in the international environment so any impact on such growth represents a serious risk for Ireland. Forecasts for global growth have in recent times been revised downwards due to a slowdown in Chinese economic growth, declining commodity prices and weakening emerging economies. Fears about global economic growth have fed into increased volatility in financial markets, which may also be a result of global imbalances, asset price inflation and the impact of sustained quantitative easing including negative interest rates in some countries.

The risk of Brexit was included in the 2014 and 2015 National Risk Assessments under the term 'Uncertainty over the UK's relationship with the EU'. Since then, a date for a

referendum on the UK's membership of the EU has been set for the 23rd June 2016. As a result, the significance of this risk for Ireland has escalated this year.

Brexit also presents a risk to the stability of the European Union itself, which has also been challenged by mass migration flows. Approximately 1 million migrants and refugees arrived in Europe in 2015, more than four times than in 2014. This influx has threatened the viability of the Schengen arrangements and has created tensions between certain member-states partly due to the imposition of border controls. If the issue is not resolved, it could undermine the EU's sense of shared purpose on which it relies to function effectively.

Another geo-political risk which has become more prominent since 2015 is that of terrorism. Domestically the threat of an attack related to international terrorism is rated as not likely but events in 2015 and early 2016 demonstrate that it is possible. The latter half of 2015 saw several incidents of international terrorism including the attacks in Paris which resulted in 130 deaths and a mass shooting at a Tunisian holiday resort in which 38 people, including three Irish citizens, were killed. And in March 2016, 32 victims were killed in co-ordinated bombings in Brussels.

The draft National Risk Assessment for 2016, set out below, takes account of these and other developments and identifies risks that have become more significant, as well as amending other risks from 2015 to reflect changed circumstances. In particular, the following risks can be considered to have greater importance this year:

- Brexit ('Uncertainty over the UK's relationship with the EU')
- Weakening Global Economic Growth
- Infrastructural Deficits
- International Terrorism
- Expenditure Pressures

In addition, some risks have been amended since 2015 to reflect changed circumstances including:

- Under-supply of Housing - Changed from 'misalignments in the property market' to reflect dampening of house-price spiral but continued under-supply.

- Risks to the Stability of the EU through mass migration flows - the issue of mass migration flows now appears to be a significant risk to the stability of the EU (apart from Brexit).
- Ensuring a sustainable, affordable and diverse energy supply - last year, this risk referred to a 'disruption to energy supply and price shocks'. In light of the challenges posed by the Paris agreement of December 2015 to limit global temperature rise as well as the White Paper vision for a transition to a low-carbon energy system, it is appropriate to re-title this risk.
- Monetary Policy Uncertainty - last year, this referred to 'Uncertainties about the impact of Quantitative easing'. The effectiveness of monetary policy across the world in 2016 remains uncertain, as global growth and deflationary concerns prevail.

Of course, many of the risks identified have not changed since last year, reflecting the fact that they remain significant risks to future national well-being even if their nature or relative importance hasn't changed significantly. In many cases, they reflect longer-term underlying risks, for example changes in the dependency ratio, loss of competitiveness or increases in chronic diseases. In others they refer to specific events, for example nuclear contamination or major pandemics, which remain significant risks for Ireland.

1.3 Consultation and Next Steps

This draft NRA 2016 is being published and laid before the Houses of the Oireachtas as the basis for a public consultation exercise. The following issues are of particular significance:

1. Have the correct risks been identified or are there significant risks that should be included?
2. Should any particular risks be prioritised in light of their significance?
3. Are any of the risks listed not significant enough to warrant inclusion?

Interested parties can make observations on the draft NRA 2016, including to the questions above, to nra@taoiseach.gov.ie by Friday 8th July 2016.

In parallel with this consultation, work will continue within Government Departments to further strengthen the quality of Ireland's risk governance mechanisms and to ensure that appropriate mitigation frameworks are in place. As outlined in last year's National Risk Assessment, this includes the work of the Government Task Force on Emergency Planning, supported by the Office of Emergency Planning, the work of the Department of Finance and the Central Bank of Ireland in relation to financial and macro-prudential risks and the Steering Group representing all Government Departments which oversees the preparation of the NRA.

Potential Risks for Ireland in 2016

ECONOMIC



- Weak Global economic growth and debt sustainability
 - Loss of competitiveness
 - Importance of multinational corporations & risk of unfavourable international tax changes
 - Vulnerabilities in the banking system
 - Turbulence in the Euro-area debt markets
 - Monetary policy uncertainties
-

ENVIRONMENTAL



- Climate change & extreme weather events
 - Ensuring affordable, sustainable and diverse energy supply
 - Food safety
 - Under-supply of housing
 - Infrastructural development
-

GEO-POLITICAL



- Brexit / Uncertainty over UK's relationship with EU
 - Devolution & related political developments in the UK
 - Risks to stability of the EU through mass migration flows
 - Terrorist incidents & armed conflicts
 - Changing distribution of global influence
-

SOCIAL



- Long-term exclusion from employment
 - Human capital
 - Expenditure pressures
 - Changes in dependency ratio
 - Increases in chronic diseases
 - Social cohesion & political stability
 - Migration & integration
-

TECHNOLOGY



- Cyber-security
 - Major pandemics
 - Nuclear contamination
 - Technological trends
 - Anti-microbial resistance
-

2. Economic Risks

Weak Global Economic Growth and Debt Sustainability

Loss of Competitiveness

Importance of multinational corporations to Irish economy and risk of unfavourable international tax changes

Vulnerabilities in the banking system

Turbulence in the Euro-area

Monetary Policy Uncertainties

2.1 Weak Global Economic Growth and Debt Sustainability

Ireland's economic performance is dependent on external demand given the openness of the economy. Global growth deteriorated throughout 2015 and risks to global growth are tilted to the downside for 2016.⁴ Concern over the pace of a potential global slowdown has grown in 2016, in an environment of low commodity prices, reduced capital flows, currency pressures, the Chinese slowdown and rising financial market volatility or a combination of various factors.

Other downside risks to growth include

- geo-political risks, volatility and liquidity concerns in financial markets, and stagnation in export markets given low inflation levels taking hold in advanced economies.

⁴ IMF 'World Economic Outlook Update', January 2016. The IMF's *World Economic Outlook* (April 2016) has revised downwards its January projections for global growth by 0.2 percentage points partly on the basis that there has been a 'pronounced increase in downside risks' (p.23).

- risks to the outlook have also risen for emerging markets economies with deep recessions emerging in Brazil and Russia.
- risks towards the sustainability of Ireland's recovery if there was a negative external global growth surprise which could endanger the attainment of medium-term fiscal targets
- The outcome of the UK referendum on EU membership. An ESRI report noted that a UK exit from the EU could reduce bilateral trade flows between Ireland and the UK by 20% or more.⁵

In contrast to these, some upside risks relate to lower oil prices, the depreciation in the euro, and the EU Infrastructure Investment Plan.

While the debt/GDP ratio fell to 93.8% by end 2015,⁶ Ireland's level of public and private debt remains high by international standards. It is also important to note that it is based on a ratio to GDP, which itself may be inflated by various factors. The Department of Finance estimates that Ireland's gross debt ratio will continue to ease in the coming years, albeit still remaining at very elevated levels. The sustainability of future debt levels is vulnerable to macro-shocks. Estimates show that a 1% reduction in world output, relative to baseline, would increase the Debt-GDP ratio by 2.2% by 2021.

The sensitivity of Government debt to a rise in interest rates on new borrowing is estimated to be low, given low future refinancing needs.⁷ However, the continued high level of private debt would be vulnerable to increases in interest rates in the medium-term or a decline in household disposable income.

⁵ ESRI 'Scoping the Possible Economic Implications of Brexit on Ireland', November 2015

⁶ See <http://www.cso.ie/en/releasesandpublications/er/gfsa/governmentfinancestatisticsapril2016/>. The Stability and Growth Pact sets a target of 60% Debt to GDP.

⁷ European Commission (2015) Country Report Ireland 2015 Including an In-Depth Review on the prevention and correction of macroeconomic imbalances.

2.2 Loss of Competitiveness

Ireland's national competitiveness refers to the capacity of enterprises in Ireland to compete in international markets.⁸ While it includes labour costs, it is a broad concept encompassing all components of business performance such as productivity, regulation of public utilities, prices, costs and labour supply. As a small regional economy in a single currency zone, Ireland is vulnerable to losses of competitiveness through wage and/or productivity developments that are out of line with those in the euro-area and beyond.

Ireland's competitiveness rankings improved slightly in 2015⁹ but some of this improvement is attributable to benign external conditions such as a favourable exchange rate which could change quickly. In addition, domestic factors including the economic recovery and the continued shortage of housing may drive up wage demands which could erode competitiveness in a low inflation environment.¹⁰

There are some tentative indications of growing pressure on wages, particularly in some public services, in the form of calls for increasing pay for new recruits and seeking a swifter than anticipated restoration of pre-crisis wage levels for existing staff. Such wage pressures risk both direct and indirect implications for competitiveness.

2.3 Importance of multinational corporations to Irish economy and risk of unfavourable international tax changes

Ireland's economy and employment are heavily dependent on a relatively small number of multinational corporations concentrated in a small number of enterprise sectors. Whilst this reflects the success of Ireland's enterprise policy in attracting foreign direct investment in these sectors, it also creates a vulnerability to changes in Ireland's attractiveness as a location for these companies. The top 10 goods export products from Ireland account for

⁸ NCC (2016) *Why Competitiveness Matters for Ireland*, Competitiveness Bulletin 16-3, March.

⁹ Ireland's overall ranking for 2016, in the IMD World Competitiveness Yearbook, showed a significant improvement from 16th in 2015 to 7th in 2016 (out of 61 economies assessed). This is Ireland's best performance since 2001.

¹⁰ The NCC's Costs of Doing Business in Ireland in 2016, notes that 'recent improvements in competitiveness in Ireland are at serious risk of being reversed' (p. 5). See

<http://www.competitiveness.ie/Publications/2016/Cost-of-Doing-Business-2016.pdf>

45% of all goods exports, drawn principally from the chemical and pharma-industries, and the IT industry dominates services exports. The top ten tax-paying groups account for 40% of Corporation Tax receipts, making this revenue stream vulnerable to weaker global growth.

There is a risk that a sector which is heavily concentrated in Ireland, such as IT or pharma, could suffer a particular shock impacting on its growth potential which could curtail inward investment. There is also a risk that the multinational companies which drive Ireland's export growth (and therefore a large part of Ireland's economy) will re-locate their business elsewhere due to issues over price competitiveness, skills shortages or changes to the tax environment.¹¹

Regarding potential taxation changes, there continues to be significant discussion and developments at EU, US and OECD levels in relation to corporation tax, including ongoing cases, and public\political pressure in many countries. Ireland has committed to the Base Erosion and Profit Shifting (BEPS) project, which aims to provide countries with domestic and international instruments that will better align rights to tax with economic activity, and Ireland has taken a first step by introducing county by county reporting in particular circumstances.¹² Ireland has the advantage of an open and transparent tax and regulatory environment, and as a small country with an open economy, it must keep pace with this international movement for change.

2.4 Vulnerabilities in the banking system

There have been positive developments in the domestic banking sector and the recovery in banks' profits is slowly improving reflecting both the improved profitability and write-backs of impairment provisions. New lending, while increasing, remains at levels which are being offset by redemptions of existing loans.

¹¹ See Purdue, D. and Huang, H. (2015) *The facts, the fictions and the risks*. Dublin: NTMA Economics

¹² <http://www.finance.gov.ie/news-centre/press-releases/minister-finance-publishes-finance-bill-2015>

The high level of impaired loans remains a major challenge for the banking system, as well as carrying a wider social and economic cost. Headwinds facing the sector include the low interest rate environment and increased regulatory costs. Market funding remains susceptible to changes in investors' risk appetite and in sentiments towards the banks and the Irish sovereign.

These factors, alongside the greater concentration in the banking sector, also pose a risk to the level and cost of credit available to both consumers and enterprises, with consequent negative economic and social impacts.

2.5 Potential for turbulence in the Euro Area Debt Markets

Concerns over a re-emergence of the Euro-area sovereign debt crisis diminished in the latter half of 2015 and in the first half of 2016. However, Government debt ratios remain high or continue to increase in many euro-area Member States. Low levels of growth continue to pose a medium-term threat.

Other events which could result in turbulence in the euro area debt markets include risks of bank losses in this negative interest environment, changes in market sentiment, capital flows, and the effectiveness of the ECB monetary policy. Downside risks include political and economic uncertainty in some EU Member States.

Any re-emergence of debt sustainability issues in the euro area could have an impact on Ireland's sovereign financing costs, the ability of the Irish Government to raise funds, and the wider stability and sustainability of the eurozone itself. The sensitivity of Government debt to a rise in interest rates on new borrowing is estimated to be low in the short term, given low future refinancing needs.

2.6 Monetary Policy Uncertainties

Inflation in the euro area has been below levels consistent with price stability¹³ for some time. As a result, and with interest rates effectively at 0%, the ECB, in March 2015, launched an expanded asset purchase programme, also known as quantitative easing (QE), to include bonds issued by euro area central governments, agencies and European institutions. Under this programme, the combined monthly purchases of public and private sector debt securities amount to €60bn. On December 2015, the ECB expanded the scope of the assets eligible for purchase (to include municipal and State debt) and extended the programme by 6 months (to March 2017).

At its meeting on the 10th March 2016, the Governing Council of the ECB announced that it was cutting all three of its interest rates and expanding asset-buying to provide a boost the Euro area economy and prevent ultra-low inflation becoming entrenched. The comprehensive package of monetary policy decisions by the ECB is to provide substantial monetary stimulus to counteract heightened risks to the ECB's price-stability objective.

QE is intended to stimulate the economy through a number of channels, principally through improved financing conditions for households and firms. It is hoped that, by exchanging assets for cash, financial institutions will have a greater incentive to lend to the private sector, households and companies. However, concerns have been expressed in relation to a number of factors, namely:

- (i) the possibility that QE may lead to an increased risk of asset price bubbles and potential underpricing of risk as investors are having to search for yield. For example, total returns on Irish commercial property reached 39 per cent in 2014, over 20 percentage points higher than the UK. But if yields contract or the low yield environment in financial markets was to unwind, it may prompt investors to divert their activity to other markets or asset types.¹⁴
- (ii) the risk that at interest-rates of close to zero, the ECB's QE programme may not achieve its goal to increase inflation to close to but below 2% and stimulate

¹³ This is defined as below but close to 2% on an ongoing basis.

¹⁴ Central Bank of Ireland (2015) *Macro-Financial Review*.

additional economic growth in the euro area, especially given the global growth concerns (including China's slowdown); and

(iii) the uncertainties around the effectiveness of QE and its duration.

In January 2016, the Bank of Japan adopted a negative interest-rate strategy, signalling that it stands ready to counter the slowdown in emerging markets and slumping oil prices. The ECB in January also stated that increased downside risks are impacting their monetary policy decisions that include "heightened uncertainty about emerging market economies' growth prospects, volatility in financial and commodity markets, and geopolitical risks". Negative interest rate and low yield environments can have consequences on the balance sheets of banks and financial companies, which in turn can impact liquidity in the markets and financial market volatility.

3. Environmental Risks

Climate Change and Extreme Weather Events

Ensuring an affordable, sustainable and diverse energy supply

Food Safety

Under-Supply of Housing

Infrastructural development

3.1 Climate Change and Extreme Weather Events

Warming of the climate system is unequivocal.¹⁵ Mitigation actions are being taken to limit warming, with clear expectations arising from the new global commitment to taking action following the Paris Climate Agreement in December 2015. However, many impacts of climate change are 'locked-in' for decades to come and adaptation actions are aimed at managing these climate change risks.

The scale and rate of climate change in Ireland is consistent with regional and global trends and these changes are projected to increase over the coming decades. Nationally, climate change will have wide ranging impacts on the environment, society, and the economy and associated sectors, including water resources, agriculture and food security, human health, terrestrial environments, critical infrastructure, biodiversity, and coastal zones.

Recent years have illustrated clearly the risks posed to Irish society by extreme weather events, with instances of prolonged cold in 2010, damaging windstorms in the winter of 2013/14, and widespread flooding in late 2015 / early 2016.

¹⁵ Intergovernmental Panel on Climate Change (2013) *Climate Change 2013: The Physical Science Basis*. Available at <http://www.climatechange2013.org/report/>

Notwithstanding the new climate legislation and structures to prepare and implement 5-yearly National Climate Mitigation Plans and National Climate Adaptation Frameworks, there is a risk of failure to invest effectively or sufficiently in both mitigation and adaptation measures required to help minimise or address the impacts of this climate change.

Apart from the risks posed by climate change itself, there are also potential compliance costs associated with current emission and renewable energy targets to 2020 and the outcome of negotiations on individual EU Member State targets for 2030 under the non-Emissions Trading Scheme which are expected to conclude in 2016 or 2017.¹⁶ In particular, the level of Ireland's 2030 non-ETS greenhouse gas emissions reduction target could potentially pose a significant challenge to the State in meeting the costs of compliance.

3.2 Ensuring an affordable, sustainable and diverse energy supply

Ireland is completely dependent, economically and socially, on secure energy supplies – particularly on oil for transport and electricity for everyday life. Ireland imports nearly all of its energy needs, as indigenous energy production amounts to only about 14% of the total primary energy supply.¹⁷ Ireland's situation as an island on the periphery of Europe renders it particularly vulnerable to disruptions to the supply of oil, gas or electricity. Such disruption could arise from natural disaster or geo-political change. Ireland is also vulnerable to sudden price movements in energy prices which could be precipitated by disruptive geo-political shocks or economic trends and would have significant economic, social and competitive impacts.

In 2015, all fossil fuels fell in price, especially oil, which had positive economic impacts on Ireland. Oil prices are not expected to return to previous high levels in the near future which would provide economic benefits for Ireland. However, continued low prices may undercut the urgency of stimulating the transition from a fossil fuel-based energy sector to a clean,

¹⁶ The *Draft Stability Programme Update* (April 2016) reports EPA estimates that Ireland will not achieve the necessary reductions and failure to comply may incur costs of hundreds of millions through the purchase of carbon credits until such time as the target is complied with.

¹⁷ International Energy Agency (2012) *Energy Policies of IEA Countries: Ireland 2012 Review*. Paris: IEA.

low carbon system which the White Paper, published in late 2015, sets out.¹⁸ If this transition is delayed, it may make a 'hard landing' more likely given that the price of carbon-based energy sources may have to rise abruptly. Energy-intensive sectors such as transport could experience disruptions as the cost of their energy inputs rise and households might have to bear some of this cost.¹⁹

3.3 Food Safety

Threats to food safety could arise from contamination of food or a significant outbreak of food-borne human illness. A food scare associated with a food product, the outbreak of a major disease in farmed animals or evidence of environmental degradation associated with agriculture would have implications for the health of citizens and where such incidents are of Irish origin would have the potential to jeopardise international trade in Irish food.

The agri-food sector is of vital importance to the Irish rural economy and is highly export dependent. In 2015, agri-food exports increased to €10.7bn. and the sector accounted for approximately 9% of total employment. Consumer confidence in Irish food and drink products at home and abroad is predicated on Ireland's excellent food safety standards, its favourable animal health and welfare standards and its sustainable grass-based farming systems. There would be an immediate impact occasioned by exclusion from certain markets and it could take a considerable period of time to recover consumer confidence and market share.

3.4 Under-Supply of Housing

Ireland's housing market was particularly affected by the economic downturn with prices falling on average by almost a half, albeit from a relatively high base. Supply was, until recently, dramatically reduced with housing completions falling from a high of 93,000 in

¹⁸ Department of Communications, Energy and Natural Resources (2015) *Ireland's Transition to a Low-Carbon Energy Future 2015-2030*.

¹⁹ European Systemic Risk Board (2016) *Too late, too sudden; transition to a low-carbon economy and systemic risk*. No. 6: February 2016.

2006 to just over 8,000 in 2013. In 2015, there were 12,666 house completions which is not sufficient to meet demand.

The mismatch between housing supply and demand has resulted in price increases. Nationally the average price of property increased annually by 6.4% in 2013, 16.3% in 2014 but began to show some moderation in 2015 with a 6.6% increase nationally (Dublin showed greater price moderation with a 2.6% increase in the year to December 2015).²⁰

The moderated increases in early 2015 have been ascribed to the introduction in February 2015, of the Central Bank of Ireland macro-prudential measures involving proportionate limits for loan to value and loan to income measurements for both primary dwelling houses and buy-to-let mortgages, in order to (i) enhance the resilience of households and banks to economic shocks and (ii) reduce the risk of bank credit and house price spirals from developing in the future.

House price increases have encouraged the movement of stock previously rented in to the sales market, particularly for those who became reluctant landlords. This and the chronic under-supply of housing in key urban areas, has led to shortage of rental accommodation and consequential increases in rents. In Dublin the rental price for houses increased by 9 per cent per annum while outside Dublin the rate of increase was 9.8 per cent.²¹ The lack of supply of affordable rental accommodation has been linked to rising levels of homelessness. An important side effect is that a lack of housing and associated high prices and rental costs could affect Ireland's competitiveness, its attractiveness for inward investment and for skilled immigrants.

A number of initiatives have been implemented to address this issue and encourage supply. However, supply of new accommodation in Dublin in particular remains persistently low compared to demand forecasts, and remains a significant risk to overall competitiveness and social inclusion.

²⁰ Central Statistics Office (2015) *Residential Property Price Index December 2015*. Available at <http://www.cso.ie/en/releasesandpublications/er/rppi/residentialpropertypriceindexdecember2015/>

²¹ Private Residential Tenancies Board, *Rent Index* Quarter 4 2015

3.5 Infrastructural development

Balanced economic growth is partly dependent on the timely provision of infrastructure in the right locations. Levels of investment in public infrastructure declined significantly during the recession. Following a peak of 5.2 % of GDP in 2008, public investment fell to a low of 1.8 % of GDP in 2013 before slightly recovering in 2014.

A growing economy and population will place increasing demands on infrastructure including housing, transport and water services. Failure to address infrastructure bottlenecks, such as increasing traffic congestion,²² will impact on competitiveness.²³ The World Economic Forum has ranked an 'inadequate supply of infrastructure' as the second most problematical factor for doing business in Ireland.²⁴

In November 2015, Govt published its multi-annual infrastructure and capital investment plan, committing to spend €27 bn. over a six year period. Capital spending would represent about 2% of GDP which would be below the EU average of 2.9%.

Another risk pertains to the public acceptance of such infrastructural development. Potential projects can undergo rigorous planning and compliance processes yet still fail to gain the support of the communities in which they might be located. It is also important to be cognisant of the prospect of imbalanced development, which does not fully harness the potential for economic renewal across the entire country. This could lead to regional disparities and increased economic/social (and political) tensions.

²² The European Commission's *Country Report Ireland 2016* notes that Dublin was the fourth most congested city of fewer than 800,000 people in the latest TomTom traffic index.

²³ The European Commission (2016) has identified upgrading infrastructure as necessary to underpin economic growth and designates it as one of the two main economic challenges facing Ireland. See Post-Programme Surveillance Report: Ireland, Autumn 2015 and Council Recommendation on the 2016 national reform programme of Ireland.

²⁴ World Economic Forum (2015) *The Global Competitiveness Report 2015-2016*. Switzerland.

4. Geo-Political Risks

Brexit/Uncertainty over UK's relationship with EU

Devolution and related political developments in the UK

Risks to the stability of the EU through mass migration flows

Terrorist incidents and armed conflicts

Changing distribution of global influence and move away from a rules-based system

4.1 Brexit/Uncertainty over UK's relationship with EU

The UK government will hold a referendum on membership of the EU on the 23rd June 2016. If the UK votes to leave (a possibility designated by the term 'Brexit'), it would present significant challenges for the EU as a whole and for Ireland in particular, especially in terms of (i) pursuit of Ireland's objectives as a Member State, as the UK is an important ally within the EU on negotiations on issues of mutual concern such as trade and the deepening of the single market; (ii) bilateral relations with the UK, including the significant economic and trading relationship; and (iii) the impact on Northern Ireland and North/South relations.

In relation to (i), the UK is an important influential voice at the table in Brussels. Ireland and the UK are allies on many of the key issues facing the EU. For example, both want to ensure that the EU is competitive, with a fully functioning digital single market. Both want a greater focus on trade agreements with global partners. The withdrawal of the UK would weaken the Union in substance and reputationally at a time of serious challenges.

Regarding (ii) a decision by the UK to leave the EU would have significantly adverse economic and financial impacts on Ireland. €1.2 billion in goods and services are traded every week between the UK and Ireland and bilateral trade flows between the two

countries could be reduced by 20 per cent.²⁵ As this is an average figure, some sectors such as agriculture could suffer a much greater reduction as the UK accounted for approximately 40% of its total production of agri-food exports in 2015. A UK exit could be expected to create obstacles in the way of seamless flows of goods, services, capital and people.

There are many other potential difficulties in many economic and administrative areas. Furthermore, while many of these issues would take time to be worked out, there could be an immediate and unwelcome pressure on exchange rates.

The nature of a future EU-UK relationship after a vote to leave would have a major impact on specifically Irish interests. However, in advance of the complex and probably lengthy negotiations between the EU and the UK it is impossible to know exactly what the probable impacts on particular sectors would be.

In relation to the impact of a Brexit on the Irish financial sector, the Central Bank has noted that this could be significant if it occurred in a disorderly manner and/or had a large negative impact on the UK economy. Currently, the five retail banks have a total loan exposure of approximately €64bn., or 21 per cent of their total assets, in the UK. Any shock to the UK economy could cause issues for future growth, profitability and loan performance.²⁶

In addition, Brexit would reduce the attractiveness of the UK for Foreign Direct Investment (FDI) because of uncertainty and reduced access to the Single Market. However the expected additional attractiveness of Ireland to new FDI projects is likely to be small.

And lastly, in relation to point (iii) on Northern Ireland, the EU has long been an important factor in sustaining peace and prosperity in Northern Ireland, and also provides a broader context for relations on these islands. Important EU funding, including through programmes like PEACE and INTERREG but also the CAP and Horizon 2020 programmes, will provide almost €3.0 billion in the six years to 2020. Overall, North-South cooperation, including through the formal channels within the North South Ministerial Council, is very closely linked to the fact that both jurisdictions are members of the EU.

²⁵ ESRI (2015) *Scoping the Possible Economic Implications of Brexit on Ireland*. Research Series No. 48. Dublin.

²⁶ Central Bank of Ireland (2015) *Macro-Financial Review*. Dublin.

A vote to leave the European Union would not end the uncertainty as the post-Brexit arrangements between the UK and the EU and the time involved in concluding negotiations remain very unclear.

4.2 Devolution and related political developments in the UK

The issue of further devolution remains a prominent issue on the political agenda in the UK, even after defeat of the referendum on Scottish independence in 2014. In the event of a vote to leave the European Union, the Scottish National Party have indicated that they would embark on an initiative to build support for independence which could have major ramifications for the constitutional make-up of the UK.

Vigilance will be required regarding any possible political or economic changes, especially for Northern Ireland. In general, a continuing commitment is required to maintain political progress, protect the institutions of the Good Friday Agreement and advance reconciliation on the ground.

4.3 Risks to the stability of the EU through mass migration flows

The migration crisis has revealed differences of approach among many EU member states. Some member states have admitted large numbers of migrants, while others have resisted taking any. At least half a dozen member states have introduced border controls in an attempt to stem the flow of migrants.

If the practice of member states reintroducing border controls were to spread, it could compromise the Single Market, a basic plank of EU architecture. The immediate negative consequences for Ireland would be economic – making trade in goods and services more difficult.²⁷ The possibility remains too that in attempting to manage its own migration crisis, the UK might consider the option of introducing checks on the border with Northern Ireland.

²⁷ The European Commission (2016) has estimated that reintroducing internal border controls on a systematic and long term basis could cost between up to €5 billion and up to €18 billion in overall direct costs alone. See *State of Play of Implementation of the Priority Actions under the European Agenda on Migration*. Com (2016) 85. Brussels.

This is a much lesser risk than any risks to the Schengen Zone, but if it happened it would have serious repercussions for Ireland.

The longer-term negative consequence of the failure to resolve the migration crisis would be on the stability of the EU itself. The chances of the Union breaking up for this or other reasons are very low, though within the realms of the possible.

4.4 Terrorist incidents and armed conflicts

There have been a number of high profile terrorist attacks in 2015 and 2016 which have underlined the possibility of terrorist threats materialising. Three Irish citizens were among the victims killed in an attack on a Tunisian holiday resort in June; a branch of Islamic State (IS) claimed responsibility for the bombing of a Russian airliner flying out of Egypt in October which killed all 224 people on board; and 130 people were killed in a series of co-ordinated terrorist attacks in Paris in November. In addition, there were numerous terrorist attacks throughout 2015 in other countries such as Turkey, Yemen and Kuwait which caused multiple fatalities. And in March 2016, a series of co-ordinated bombings in Brussels left 32 victims dead.

The ongoing upheaval in the Middle East and the rise of IS drives many of these attacks. Europol has speculated that there is every reason to expect that IS or its affiliates will undertake a terrorist attack somewhere in Europe again intended to cause mass casualties amongst the civilian population.²⁸ Following the recent attacks in Brussels on 22 March, this risk is expected to endure during 2016. Like other countries, Ireland and its citizens could be negatively affected by terrorist incidents, depending on the location of such incidents and their wider impact. And it is also the case that terrorist incidents in geographically distant locations may have an effect if they deter tourists travelling to Ireland.

There is also the possibility that a state like Ireland would be used as a location from which attacks could be launched. Such incidents would be likely to cause extreme disruption in the short-term and possibly longer-term reputational damage to Ireland as a safe and secure destination. A breakdown in international peace and security arising from inter-state wars

²⁸ Europol (2016) *Changes in Modus Operandi of Islamic State Terrorist Attacks*.

or other armed conflicts could have significant repercussions for Ireland and the EU, including disruptions to energy supplies, transport routes or the environment.

On the island of Ireland itself, the Good Friday Agreement has delivered a stable peace process that commands overwhelming cross community support. Nonetheless, certain groups in both communities, with very limited levels of support, remain intent on disrupting the progress which has been achieved. Accordingly, vigilance needs to be maintained and legacy issues arising from conflict in Northern Ireland and current social and economic challenges need to be addressed.

4.5 Changing distribution of global influence and move away from a rules-based system

As a result of globalisation, there is likely to be an ongoing significant shift of political and economic power to countries in the East and South. These trends are challenging the existing international order in which liberal democracies have played the dominant role. They will necessitate deepening engagement with Asian, African and Latin American countries, if Ireland is to protect its interests in promoting trade, tourism and investment.

Slowed world economic growth and in particular the lower energy and commodity prices will increase the economic pressures on emerging market economies. The rule of law in many of these countries could be weakened further as has been seen in Russia. Pressures in the Caucasus and Central Asia are likely to be particularly heavy, contributing to internal instability and possibly interstate tensions.

Ireland has benefited from the opportunities offered by rules-based multilateralism, as exemplified by our membership of the UN, and any move away from this system would be counter to Ireland's interests. Accordingly, Ireland will need to develop a coherent strategy aimed at preserving the open, transparent and effective character of institutions of global governance, including in the trade and financial sphere, in changing times.

5. Social Risks

Long-term Exclusion from Employment

Human capital

Expenditure pressures

Changes in Dependency Ratio

Increases in Chronic Diseases

Social Cohesion and Political Stability

Migration and Integration

5.1 Long-term Exclusion from Employment

Unemployment is one of the most significant symptoms of the depth of Ireland's economic recession. Thanks to a growing economy, Ireland has experienced significant reductions in unemployment since 2012. At the end of 2015, the unemployment rate stood at 8.7%. The long-term unemployment rate decreased from 5.8% to 4.7% over the year to Q4 2015, down from a high of over 9% in 2012. Long-term unemployment accounted for 54.5% of total unemployment in Q4 2015 compared to 58% a year earlier.²⁹ From a comparative perspective, this rate is still high as it exceeds the EU average of 48.2%.³⁰

Long-term unemployment remains a serious concern, with the risk that cyclical unemployment could become structural in the absence of appropriate targeted labour activation interventions. There is a risk that this group may not share in the employment recovery, and that high levels of long-term unemployment will persist for some time. Related to this, is a risk of exclusion of people on other forms of working age social welfare

²⁹ Central Statistics Office (2016) *Quarterly National Household Survey, Quarter 1 2016*.

³⁰ European Commission (2016) *Country Report Ireland 2016*.

(for example disability and lone parent schemes) from employment as the economy recovers, in the absence of effective labour market interventions.

This could have significant consequences for the individuals concerned, their families and their communities, and for increased levels of social spending. It is therefore important to seek higher participation rates among those in receipt of other working age social welfare payments and to address the number of jobless households, which stands at a relatively high level.³¹

While the unemployment figures have improved, skills mismatches have emerged. As the recovery has been strongest in skill-intensive sectors, job opportunities have become available for high-skilled workers who have achieved a tertiary education. For those who have achieved such a level, unemployment was 6 per cent in Q4 2014 but for those who have left school with a lower secondary education, it stood at 18%. For younger workers (under 25s) from the latter cohort, the difference is even more pronounced with 37% experiencing unemployment.³²

5.2 Human capital

Future economic performance will critically depend on the quality of human capital. Ireland's competitive advantage in international markets, as well as the competitiveness of our regions, will increasingly be driven by the availability of world class skills at all levels. The OECD has called skills the new global currency of 21st century economies. As risks emerge to other areas of competitive advantage such as the corporate tax regime, it is important that Ireland's strong position in terms of the availability of talent is protected.

There are some short term risks associated with the skills gaps which are emerging between labour market requirements and the nature and level of available skills. For example, while there is still a substantial overall level of unemployment, there are issues regarding skills shortages and mismatches in labour market areas such as higher level ICT skills. If employers

³¹ European Commission (2014) *Macro-Economic Imbalances Ireland 2014*. European Economy Occasional Papers 181. Brussels, p. 59.

³² Expert Group on Future Skills Needs (2015) *National Skills Bulletin 2015*, p. 45.

are not able to source appropriate skills domestically, this will have a detrimental impact on the cost base and productive capacity of the economy.

There is also a longer term risk that, without reforms and the optimal deployment of available resources, the education and training system will not (in light of demographic pressures) meet the skills requirements of a fast-changing labour market with strong global competition for investment and talent, negatively affecting economic performance and employment growth.

The higher education system has experienced a fall in core funding and a rise in the staff to student ratio since 2008. This reduction has led some to consider that the capacity of the system to contribute productively to the formation of human capital and innovative activities has been impaired. This risk has led to calls for changes to the current funding model.³³

5.3 Expenditure pressures

The recession and subsequent troika programme necessitated a consolidation of the public finances. As the economy recovers, there may be a public expectation that restraints on social and other government expenditures can be released and efficiency measures reversed in the short-term (including in relation to public service pay), notwithstanding the need to maintain budget discipline, reduce the high level of public debt, and ensure medium-term fiscal sustainability in the context of demographic trends. In addition, there may be insufficient understanding of the binding implications of the European Union's fiscal rules which require that the Government conform to an expenditure benchmark and move towards a balanced budget in structural terms.

It has been noted that there may be a tension between these kinds of constraints and expenditure pressures arising from demographic growth, investment needs and public

³³ Expert Group on Future Funding for Higher Education (2015) *Funding Irish Higher Education - A Constructive and Realistic Discussion of the Options*. Discussion Paper for Stakeholder Consultation.

demands both for increased services and cuts in taxation levels beyond what may be sustainable over the economic cycle.³⁴

5.4 Changes in Dependency Ratio

Despite net outward migration, Ireland's population has continued to grow in recent years. The population increased from 4.24 million people in 2006 to an estimated 4.64 million in 2015. This highlights the importance of the age dependency ratio, i.e. the ratio of the old and young population to the population of working age. The future age dependency ratio is important because it points to impacts in areas such as education, child income supports, healthcare, long-term care, housing and pension provision.

The Central Statistics Office has provided projections of possible changes in the dependency ratio up to 2026 based on a number of different scenarios.³⁵ About 85% of the difference between high and low assumptions for changes in the population and dependency ratio is explained by potential migration flows. Under all scenarios, births are expected to fall in the period 2016-2026 before then picking up and the number of primary school children will increase up to 2021 and then this cohort will graduate to secondary level between 2021-26 and to third-level after that. Again under all assumptions, the over-65 population will increase considerably in future years. This will give rise to extensive pressures on sustainability of public spending in areas of pensions, long-term care and health.

5.5 Increases in Chronic Diseases

Chronic diseases, such as heart disease and cancer, are the leading cause of death and morbidity in developed countries. The rise in childhood obesity and other trends can be seen as an indicator of future rises in chronic diseases e.g. diabetes, cardiovascular disease, chronic obstructive pulmonary disease (COPD), arthritis etc. It is estimated that within the next decade, the number of adults with chronic diseases will increase by around 40%, with relatively more of the conditions affecting those in the older age groups. For example, the

³⁴ Irish Fiscal Advisory Council (2014) *Fiscal Assessment Report: November 2014*.

³⁵ Central Statistics Office (2014) *Population and Labour Force Projections*. Stationery Office: Dublin.

obesity levels for both men and women in Ireland are higher than those for most of Western Europe.³⁶

It is estimated that 80% of healthcare expenditure relates to chronic diseases. The economic burden is considerable not only for the health system but also in terms of families and society as a result of reduced income, early retirement, an increased reliance on social care and welfare support and diminished productivity and absenteeism.

5.6 Social Cohesion and Political Stability

The recession and its consequences in Ireland had a damaging effect on public trust. For the last few years, Ireland has scored quite lowly in measures of average trust in institutions although its ranking is slightly up since last year.³⁷ Despite this deficit of public trust, Ireland appears to be just above average in terms of its levels of social cohesion.³⁸ However, this level of cohesion cannot be taken for granted and the political diversity apparent in some European countries has increased in Ireland following the general election in early 2016. The formation of a new minority Government in May 2016 will require the development of new processes for the resolution of differences between the Government and parliament to ensure co-operation and stability.

5.7 Migration and Integration

Recent years have seen a new wave of emigration from Ireland, with the Central Statistics Office estimating that net outward migration of Irish nationals stands at just over 23,000 per annum.³⁹ Concerns have been expressed that Ireland is losing some of its most dynamic and skilled members of society when it needs them to help power its recovery, although a

³⁶ http://www.who.int/gho/ncd/risk_factors/overweight/en/

³⁷ The Edelman Trust Barometer 2016 shows a slight increase in average levels of trust in institutions from 37 per cent to 39 per cent over the last year.

³⁸ The Bertelsmann Foundation's study *Social Justice in the EU – A Cross National Comparison* (2015) shows that Ireland's rating for social cohesion and non-discrimination is 5.95 (out of a possible 10), just above the EU average of 5.91. Ireland's score has declined by 0.14 since the previous year

³⁹ Central Statistics Office (2015) *Population and Migration Estimates April 2015*. This represents a decline of 6000 from the previous year.

higher proportion of immigrants into Ireland possessed a third level degree than of emigrants from Ireland.⁴⁰

A related, but different, issue concerns the integration of migrants who have come to Ireland. Over a generation, Ireland has changed from an ethnically homogeneous society to a much more multi-ethnic one, a transformation reflected in rural as well as urban communities. Census 2011 disclosed that 12% of the population were born outside the State. In response to the Migration crisis in Europe last year, the Government announced in September that Ireland would accept up to 4,000 persons overall under Resettlement and Relocation Programmes.

This increase in the immigrant population has happened in a very short time-scale and without any of the upheaval which has occurred in other countries with such dramatic movements of the population. Failure to maintain this level of cohesion, especially as second and third generation migrant communities emerge, represents a significant risk.

⁴⁰ *ibid*

6. Technological Risks

Cyber security

Major pandemics

Nuclear contamination

Technological trends

Anti-microbial resistance

6.1 Cyber security

At a national level, there is clear recognition that the internet is a key enabling infrastructure for economic growth and prosperity. However, unlike traditional economic and social infrastructure, our geographical position does not provide any protection from cyber-attacks. The threat landscape continues to evolve, and a wide range of significant risks arise for key national infrastructure such as energy, transport and telecoms systems. This is an issue of growing concern at EU and international levels.

A specific risk for the public service is theft or compromising of data collected by the public service which would reduce confidence in public service administration and the use of technology for public services. There are also pressing risks for businesses and individuals, including the loss or theft of personal or business information, or even the destruction of property.

6.2 Major pandemics

Pandemics are unpredictable but recurring events that can cause severe social, economic, and political stress. History shows us that pandemics can cause death and illness on a significant scale and disrupt normal social and economic activity. International exercises and experience indicate that a pandemic has the potential to significantly disrupt economic and social life with the possibility of energy and food supply shortages. The outbreak of Ebola and the transmission of the virus outside of Africa is a reminder that as the world becomes more connected, facilitating the spread of viruses, the risks of a pandemic becomes greater. Many emerging human diseases with pandemic potential have originated in animals prompting the "One Health" concept which recognises the links between public, animal and environmental health.

6.3 Nuclear contamination

The potential contamination of Ireland as a result of fallout from a nuclear accident is a risk, albeit one of low probability. Apart from the obvious risks to public health and well-being, the potential for impact on Ireland's agricultural production, particularly reputational risk, is significant. This could arise in the event of consumer resistance to even miniscule levels of radioactivity in the food chain and Ireland's competitors portraying Ireland's food products as unsafe were contamination to occur.

In view of the potentially catastrophic humanitarian consequences of a nuclear detonation it will remain important to continue international engagement relating to nuclear safety, as well as on nuclear disarmament and non-proliferation.

6.4 Technological trends

Many analysts are now predicting that we are at a crucial point in the development of ground-breaking technologies and their incorporation into everyday life. Developments such as artificial intelligence, robotics, the internet of things, autonomous vehicles, 3D printing, nanotechnology, biotechnology, materials science, energy storage and quantum computing and many more may transform all the lives of everyone.

These transformations wrought by these and other technological developments may mean that some businesses and products could become obsolete relatively quickly. Successor businesses will obviously arise but the risk is that these will be less dependent on human labour than before. For example, Kodak was forced into bankruptcy as a result of being unable to compete with Instagram. At its height, Kodak employed 145,000 workers whereas Instagram employs less than 5,000.⁴¹

The risk arising from current technological trends is that people may be displaced from their current employment positions and may not be able to access adequate alternatives. One recent study⁴² examined over 700 different occupations in the United States and estimated that 47% of total US employment was susceptible to computerisation and automation. Jobs in transportation, logistic, as well as office and administrative support, were deemed at 'high risk' of automation but even some occupations within services and sales industry were also highly susceptible. Research by the Bank of England indicates that 15 million jobs in the UK may be at risk from automation.⁴³

Others caution against believing that entire occupations will be replaced by technological advances as even those occupations at high risk of automation require the performance of non-routine activities. It is the extent of routine tasks within occupations that render them vulnerable to automation. On this basis, research for the OECD, across 21 countries including Ireland, has calculated that the share of jobs at high risk from automation is 9 per cent. The research concludes on the 'need to focus more on the potential inequalities and

⁴¹ For a discussion of this issue, see Brynjolfsson, E. And McAfee, A. (2014) *The Second Machine Age: Work, Progress and Prosperity at a time of Brilliant Technologies*. New York: W Norton & Company.

⁴² Frey, C. and Osborne, M. (2013) *The Future of Employment*. Available at http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf

⁴³ Haldane, A. (2015) Labour's Share. Speech to Trades Union Congress, 12th November. Available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2015/speech864.pdf>

requirements for (re-)training arising from technological change rather than the general threat of unemployment that technological progress might or might not cause'.⁴⁴

6.5 Anti-microbial resistance

The rise in antimicrobial resistance (AMR) is recognised at global and European levels as one of the greatest potential threats to human and animal health, with possible serious consequences for public health, animal welfare and the agriculture and food sectors. The advances achieved as a result of antimicrobial drugs are now seriously jeopardised because of the emergence and spread of resistant strains of microbes against which an increasing number of such drugs are ineffective. AMR already represents a significant human health threat and contributes to increased morbidity, mortality and healthcare costs. If AMR continues to rise, it will become increasingly difficult and expensive to control and treat infections in medical care and more difficult to maintain animal health and welfare.

⁴⁴ Arntz, M., T. Gregory and U. Zierahn (2016), "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis", OECD Social, Employment and Migration Working Papers, No. 189, OECD Publishing, Paris. <http://dx.doi.org/10.1787/5jlz9h56dvq7-en>, p. 25. This study estimates that 8% of jobs in Ireland have a high risk of automatibility.

