Chapter 12

Global economic risks

Lecture 5 talked about risks in general from an individual’s viewpoint, and Lecture 4 talked about the risk-reward tradeoff in the special setting of stock market type investment. One can consider risks and chance from the viewpoint of an organization, but the variety of organizations and risks is so large that I’m not competent to write a lecture on that topic. Instead let me jump up to the global level – risks to the world as a whole. When preparing the 2011 course, the repercussions of the Late-2000s financial crisis (W) were still prominent in the news. What undesirable events with comparable magnitude consequences might you be reading in headlines sometime within the next 10 years?

12.1 Future global shocks: a 2011 OECD report

The working definition of future global shocks in this report\(^1\): a rapid onset event with severely disruptive consequences covering at least two continents.

History tells us what shocks have happened in the past. The focus of the report to consider how ongoing changes in the state of the world – economies, technologies, social and governmental structures – may allow quite novel shocks, or amplify the magnitude of previously experienced shocks.

The report points out 5 ongoing changes as potential “drivers” of shocks.

- *Heightened mobility* of data, people and commercial transactions.

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\(^1\) [www.oecd.org/dataoecd/24/36/48256382.pdf](http://www.oecd.org/dataoecd/24/36/48256382.pdf) . Only 11% of my 2011 students knew what the OECD (W) is, without contextual clue
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- Herd behavior and “groupthink” in corporations and professions and among regulators.

- Interdependency of production and delivery systems and their infrastructure. In brief, if the electric power grid were disrupted then much economic activity, in particular communication networks, would cease to function, but the electrical power industry itself is dependent upon such communications to function.

- Centralisation and concentration of systems exemplified by the hub-and-spoke organization of air freight carriers.

- Urbanisation and concentration of populations and assets.

The report then analyzes 5 possible shocks, not necessarily the most likely or the most serious, to illustrate the variety of possibilities.

- Social Unrest.

- Financial Crisis.

- Pandemic.

- Critical Infrastructure Disruption.

- Geomagnetic storm.

The first three are familiar from history, so I will be brief.

Social unrest runs from protests against a government, at a level sufficient to disrupt economic activity within a country, up to revolutionary change of government. It is widely believed that the modern instant availability of news and opinions from many sources makes social unrest more liable to spread quickly from one country to similar other countries. Quoting the report: Financial crises are situations in which financial institutions or an asset class suddenly lose a large part of their value, e.g. bank-runs, financial asset bubble bursts, currency crises, balance of payments crises and sovereign default. The direct results of such events are a loss of paper wealth, but more importantly they may spread to the real economy with the onset of recession due to dependence of consumer demand and business investment on high levels of debt. When lending contracts, debt-fuelled expansion is no longer possible and a sharp economic slowdown becomes inevitable. [Severe price drops] in the housing market during the latest recession worsened the slowdown in consumer spending as households
could no longer borrow against rising equity values. The resulting slowdown of investment in the real economy impacts actors at all levels, from small businesses to home-buyers. Bankruptcies lead to job losses and a drop in aggregate demand, leading to more businesses and individuals being unable to repay their loans, reinforcing a downward spiral that can have a devastating impact not only on economic prosperity across the board, but also on consumer sentiment and trust in the ability of the system to generate long-term wealth and growth.

*Pandemic* may refer to a new disease, exemplified by the “near pandemic” of SARS (W), or an existing disease, in particular influenza. Quoting the report,

Three influenza pandemics occurred during the 20th Century: 1918-19, 1957-58, and 1968-69. Most professionals in public health, medicine and epidemiology consider the next flu pandemic to be inevitable [ sometime]. The WHO considers 2 to 7.4 million deaths globally as a conservative estimate of an H5N1 avian flu pandemic, with substantial effects on both the physical and financial health of countries.

Increased mobility and population density are widely expected to increase the frequency of future pandemics.

Regarding infrastructure, an industrial economy is dependent on a wide range of physical networks – electricity, gas, water; road and rail and air; telephone and internet. In the past there were only a limited number of ways in which a whole network might be disrupted – widespread natural disasters or widespread human conflict at the physical locations. Nowadays there are concerns that because of dependence on software and the internet, by accident or deliberate attack, either a large part of the internet or a specific part of infrastructure accessible via the internet or software (e.g. a less focussed analog of Stuxnet (W)) could be disrupted, from anywhere in the world. A different example is identity verification in online commerce; sufficiently large scale fraud would destroy confidence.

*Geomagnetic storms* (W) are a comparatively little-known kind of natural disaster. A repeat of the largest observed (1859) such storm would (it is estimated) do massive damage to electrical transmission equipment in northerly latitudes, and to satellites (and thereby GPS and communication devices). It is a timely topic, because such storm are most likely at the 2012-3 peak of the 22-year solar cycle.
12.2 So how good are such risk estimates?

In the previous section I merely summarized the report. Speculating on
the accuracy of the assessments of this particular report does not seem
useful. But of course one could look at similar exercises in the past, and
compare their probability estimates to what subsequently happened. For
instance, a cynical view of retrospective analysis of the late-2000s financial
crisis is that commentators say either “no-one saw it coming” or “I saw it
coming”, depending on whether they can exhibit evidence of the latter. Is
such cynicism justified?

Each year since 2006 the OECD has produced a “global risks” report\(^2\)
for the World Economic Forum (W) annual meeting in Davos. The 2007
report, written around January 2007 (at which time there were concerns
about the worldwide boom in house prices, and some concerns about U.S.
subprime mortgages, but nothing dramatic had happened in other markets)
gave, as in other years, a list of “core global risks”, summarized using the
conventional likelihood vs (economic) severity graphic, is copied on the next
page.

\(^2\) Available at http://www.weforum.org/reports
12.2. SO HOW GOOD ARE SUCH RISK ESTIMATES?

The 23 Core Global Risks: Likelihood with Severity by Economic Loss

Note: Likelihood was based on actuarial principles where possible. For most risks, however, qualitative assessment was used.
The entry “asset price collapse”, defined via

A collapse of real and financial asset prices leads to the destruction of wealth, deleveraging, reduced household spending and impaired aggregate demand

appears as the 5th most likely of the 23 risks, but quantifying risk as likelihood times severity it is assessed as the greatest of these risks. So – given these 5 risks were assessed to have 10-20% likelihood and that one of them occurred with even more than predicted severity – this OECD assessment is actually as good as one could hope for.

As an aside, the “oil price shock” assessed as 4th most likely did almost occur in 2007-8 but was overtaken by the asset price collapse and did not have the severe impact predicted – see chart below.

With this in mind let us look at the corresponding graphic from the 2011 report.
12.2. SO HOW GOOD ARE SUCH RISK ESTIMATES?

Figure 1 | Global Risks Landscape 2011: Perception data from the World Economic Forum’s Global Risks Survey
Note both graphics use a log scale on severity/impact, but some (roughly) linear scale on likelihood.

Note. In class I give brief verbal discussions of the various risks in the current year graphic, which I do not wrote out here.