Systemic risk in non-financial companies

Eddy Wymeersch[1]

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SAMENVATTING

Traditioneel stond het systemische risico centraal in financiële ondernemingen. In deze bijdrage wordt het fenomeen van systemische risico's onderzocht in niet-financiële ondernemingen. Het fenomeen van systemische risico's wordt eerst in kaart gebracht, zowel in de financiële sector als in de niet-financiële sector. Disrupties in de niet-financiële sector worden concreet gemaakt met een aantal voorbeelden. Vervolgens wordt onderzocht met welke instrumenten systemische risico's beheerst kunnen worden.

RÉSUMÉ

Le risque systémique est traditionnellement au centre des préoccupations des entreprises financières. Cette contribution examine le phénomène des risques systémiques dans les entreprises non financières. Ce phénomène des risques systémiques est d'abord identifié, tant dans le secteur financier que dans le secteur non financier. Les disruptions dans le secteur non financier sont illustrées par un certain nombre d'exemples. Sont ensuite examinés les instruments pouvant être utilisés pour maîtriser les risques systémiques.

I. Systemic crisis in the financial and the non-financial sectors

The orientation of the financial regulatory patterns towards systemic concerns is one of the most significant changes in the regulatory system for the last 10 to 20 years. It became particularly relevant during and after the Great Financial Crisis of 2007 e.s.

Previously, financial regulation and supervision mainly dealt with the analysis and oversight of the individual financial institutions and their operations. The objectives originally aimed at the protection of the individual market participants, the investors, the customers or parties looking for insurance coverage. However, protecting their interests is largely tributary of the overall position of the institution, in terms of its solvency and liquidity. These regulatory objectives are dealt with at the micro level, this means at the level of each institution separately, and are referred to as micro-prudential. But over time we have learned that financial institutions are widely interdependent, whether they are economically interrelated or not. Events at one institution or in one jurisdiction may have significant consequences on other institutions, even on the entire financial system which is often referred to as the macro aspect, addressed in "macro-prudential" measures, affecting a wider population, even outside the financial system.

The objective of these measures is essentially to avoid major crises to erupt and to trigger a "systemic crisis", a breakdown of the entire financial system and more widely of the economy at large. The prudential authorities in charge of overseeing and monitoring developments which may point to a sys-

1. Professor em. UGent, in honour of Prof. Dr. K.J. Hopt. Deze bijdrage verscheen eerder in *Festschrift für Klaus J. Hopt zum 80. Geburtstag am 24. August 2020*, De Gruyter, 2020.

temic risk will have to analyse the conditions in which financial stability can be endangered, which may later degenerate in a full scale collaps of the system. Observation, analysis, monitoring of general evolution, addressing individual players, and finally adopting public interventions have been the principal steps in dealing with a systemic crisis.

Systemic crises have most of the time been studied as relating to the financial sector, where they occur most frequently, are best visible and cause considerable damage. This phenomenon is not limited to the world of finance, and comparable developments can be identified in the "real economy", here the world of industrial production and commercial services.

Breakdowns in one sector may affect a much wider population, and lead to endanger the economy of the state in which this sector occupies an important position. More generally, certain political decisions may lead to a disruption in a country's economic relations with other states or even with the entire world. Worldwide doubts about the future climate and the related sustainability already puts question marks to many industrial or economic initiatives. These and other similar challenges have come more clearly to the attention of the international financial institutions, to the academic world, and to the political decision makers. Strikingly, while a very elaborate system has been developed for the financial sector, very few concrete studies have focused on the non-financial sector, the world of industry, commerce or transportation. A comparison between the instruments developed in the financial sector for dealing with "systemic risks" may usefully inspire a reflection addressing the non-financial sector.

II. FINANCIAL STABILITY AND SYSTEMIC RISK IN THE FINANCIAL SECTOR

The notions of financial stability and systemic risk are closely interrelated. They have been defined in many ways.[2] The ECB has defined financial stability in wide terms as: "A condition in which the financial system – which comprises financial intermediaries, markets and market infrastructures – is capable of withstanding shocks and the unravelling of financial imbalances. This mitigates the prospect of disruptions in the financial intermediation process that are severe enough to adversely impact real economic activity. Under the heading of financial stability all functions exercised in the financial system are interrelated, and contribute to maintain its stability, or in the reverse hypothesis, may destabilize some part of the system, and in the worst case the entire system."[3]

This definition of *stability* should be read as in invitation to pay attention to financial *instability* and to the factors which create the latter. Analysis and research is therefore essentially focused on these destabilizing factors, allowing prudential authorities to conclude to the absence of significant destabilizing elements, or conversely, pointing to the developments which potentially may lead to major financial or economic shocks. It mainly analyses the causes of the instability, the instruments to avoid these, and how resulting shocks could be absorbed.

An economic system is referred as subject to "systemic" risk when its financial or economic status is gravely destabilized to the point that it may collapse, or that its major components, such as its main economic units, stop to function. Usually it refers to the financial system affecting a large number of institutions (banks, insurance companies, investment funds, pension funds, etc.) but also to mechanisms (derivatives[4], securities trading in general or payment systems, trading markets, financing, FinTech and BigTech) and their

2. There are numerous statements and studies proposing definitions of "systemic risk": See the numerous publications on SSRN "systemic risk". See further: G.J. SHINASI, "Alternative definitions of financial stability", *IMF Working paper*, 2004, 04/187 p. 13 *et seq.* "*Financial stability* is *defined* in terms of its ability to facilitate and enhance *economic* processes, manage risks, and absorb shocks. Moreover, *financial stability* is considered a continuum: changeable over time and consistent with multiple combinations of the constituent elements of *finance.*"; G. KAUFMAN and K.E. SCOTT, "What Is Systemic Risk, and Do Bank Regulators Retard or Contribute to It?", *The Independent Review*, v. VII, n. 3, Winter 2003, ISSN 1086-1653, Copyright © 2003, p. 371-391. "It refers to the risk or probability of breakdowns in an entire system, as opposed to breakdowns in individual parts or components, and is evidenced by comovements (correlation) among most or all the parts." ST. SCHWARCZ and L. STEVEN, *Systemic Risk. Duke Law School Legal Studies Paper*, No. 163; *Georgetown Law Journal*, Vol. 97, No. 1, 2008. Available at SSRN: www.ssrn.com/abstract=1008326; O. De Bandt and P. HARTMANN, "Systemic Risk: A Survey (November 2000)", *ECB Working Paper*, No. 35. Available at SSRN: www.ssrn.com/abstract=258430. Common to many of these definitions is the widespread damage to society at large, possibly bringing down the entire financial system ("too big to fail") , or an entire industry or economy. G.L.Lo. SCHIAVO, *The role of financial stability in EU Law and Policy*, 2017. The harmful consequences will be felt in a large part of society. For the UK Stewardship code, Pr.4, these are risks that may cause the collapse of an industry, financial market or economy, such as climate change, and with wide social impact.

3. The ECB defined financial instability: "The risk that the inability of one institution to meet its obligations when due will cause other institutions to be unable to meet their obligations when due. Such a failure may cause significant liquidity or credit problems and, as a result, could threaten the stability of or confidence in markets." ECB, 2004, Annual report; A.G. HALDANE and R. MAY, "Systemic risk in banking ecosystems", *Perspective*, 20 January 2011, 351; L. DE GUINDOS, *Foreword to Financial Stability Review*, www.ecb.europa.eu/pub/financial-stability/fsr/html/ ecb.fsr201811.en.html#toc1. Compare for the non-financial world: the definition in the UK Stewardship code, Principle 4: "Systemic risks are those that may lead to the collapse of an industry, financial market or economy and include but are not limited to: climate change; and the failure of a business or group of businesses."

4. P. SAGUATO and G. FERRARINI,"Clearing Houses and Systemic Risk" in *Systemic Risk in the Financial Sector Ten Years After the Great Crash*, D.W. ARNER, E. AVGOULEAS, D. BUSCH and S.L. SCHWARCZ (eds.), Oct. 2019. See also: FSB reports consider financial stability implications of BigTech in finance and third party dependencies in cloud services, 9 Dec. 2019.

impact on the overall economy (e.g. cyber risk[5]). In the 2007-2008 crisis, not only were several major banks failing, or on the point of failing, and markets were closed down, but also further downstream, the productive industry was severely hit, new orders having stopped to come in, while factories suspended their activity or had to be closed down[6], on the longer term resulting in a widespread fall in income and in increased poverty.

Financial stability analysis has mainly been developed focusing on the financial sector, originally mostly in relation to the position of banks, later extended to other financial institutions and intermediaries, also including the non-banking financial institutions (or "shadow banking"), and lastly including mechanisms and developments in the economy in general. The focus on the financial business is mainly to be attributed to the amplitude of these crises, the strong amplifying interconnection between these different segments, leading to a higher risk of contagion among them, also due to the higher volatility of these. The impact of financial crises on the economy and the wider society has in general been very destructive, with often long-lasting effects on the population and social cohesion. The financial authorities therefore developed a wide range of instruments to oversee and monitor financial institutions in case the imbalances would become too menacing. The multinational nature of these developments requires them being analysed and structured both at national and international level.

At the international level, these oversight activities are developed and coordinated by the Financial Stability Board (FSB), created in 2009 as one of the leading international post-crises initiatives[7], and regrouping central banks of all the leading economies of the world, the main international financial institutions and the worldwide active financial standard setters.[8] Its reports and recommendations are addressed to these members of the board and at the political level discussed at the G20 meetings. They serve as a model for analysis and action on a worldwide basis.

The FSB is in charge of identifying vulnerabilities in the national and global financial system with a view of developing the necessary regulatory or supervisory actions, addressing these vulnerabilities and curb their possibly detrimental outcomes.[9] The reports by the FSB focus on the risks developed by major financial institutions, identifying these as the Global Systemically Important Financial Institutions (G-SIFIs) and Global Insurers (G-SIIs). It developed the Key Attributes of Effective Resolution[10] for financial institutions which inspired the resolution regimes in many jurisdictions. But beyond these traditional segments of the financial system, it drew attention to issues at the limits of the banking system, such as the so-called shadow banking, better referred as Non-Bank financial intermediation, including the developments in Other Financial Intermediaries.[11] Certain topics on its agenda are more cross-sectoral and may be applied in all – business or not – organizations: cyber resilience, crypto assets, sound compensation schemes, SME financing and commercial real estate financing and even analysing misconduct risk.[12] Some of these factors may create significant risks and undermine the stability of many types of organizations. Other well established topics have a wider relevance: the accounting, auditing and reporting rules, oversight of auditing standards and formulating expectations for audit quality. FSB, as a supranational entity, has

5. Separate advisory business lines have sprung up due to the – systemic – consequences of some types of risk: Cyber risk management, risk governance, environmental advice, etc.
6. This was the case in the 2007 systemic crises, especially in the fall of 2008, as numerous industrial and commercial firms had to close.
7. See: www.fsb.org/about/. Its objective is formulated as promoting international financial stability, while its first assignment is to "Assess vulnerabilities affecting the global financial system as well as to identify and review, on a timely and ongoing basis within a macroprudential perspective, the regulatory, supervisory and related actions needed to address these vulnerabilities and their outcomes".
8. The FSB is composed of the G20 authorities, being their central banks and treasury departments and the international financial institutions (IMF, World Bank, OECD, ECB, IOSCO). Are also members the IAIS, BCBS, IASB, CPMI, CGFS.
9. See for new and emerging vulnerabilities, several of which will cover cross sectoral issues: FSB sets out 2020 work programme, 17 December 2019, www.fsb.org/2019/12/fsb-sets-out-2020-work-programme/.
10. FSB Key Attributes of Effective Resolution Regimes for Financial Institutions, 15 Oct. 2014.
11. See FSB publishes annual report on non-bank financial intermediation, 19 Jan. 2020; FSB, Global Monitoring Report on Non-Bank Financial Intermediation 2019 – Financial Stability Board, 19 Jan. 2020; also dealing with OFIs or Other Financial Institutions, defined as all financial institutions that are not central banks, banks, insurance corporations, pension funds, public financial institutions or financial auxiliaries. FSB, Enhancing Resilience of Non-Bank Financial Intermediation, 19 Jan. 2020; See for the European analyses: ESRB Assessing shadow banking – non-bank financial intermediation in Europe No 10/July 2016 by L. AUBERT, J.B. HAQUIN, C.N. KILLEEN and C. WEISTROFFER, www.esrb.europa.eu/pub/pdf/occasional/20160727_occasional_paper_10.en.pdf; ESRB, EU Shadow Banking Monitor. 2018, www.esrb.europa.eu/pub/pdf/reports/esrb.report180910_shadow_banking.en.pdf; D. BUSCH and Mirik B.J. VAN RIJN, "Towards Single Supervision and Resolution of Systemically Important Non-Bank Financial Institutions in the European Union", *European Business Organization Law Review*, 2018, 301-363.
12. FSB Stocktake of efforts to strengthen governance frameworks to mitigate misconduct risks, 23 May 2017; FSB publishes toolkit to mitigate misconduct risk, 20 April 2018 (several statements). FSB, Strengthening Governance Frameworks to Mitigate Misconduct Risk: A Toolkit for Firms and Supervisors, 20 April 2018; FSB, Recommendations for national supervisors: Reporting on the use of compensation tools to address potential misconduct risk, 23 November 2018; See 1.2.3 Dutch Governance Code, referring to "misconduct and irregularities". Among the policy instruments, whistleblowing is to be mentioned: see OECD: Whistleblower Protection Frameworks, www.oecd.org/g20/topics/anti-corruption/48972967.pdf; High Level Principles for Effective Protection of Whistleblowers were endorsed at the G 20 Osaka meeting.

no formal legal authority[13] and its decisions, standards[14] or rather recommendations have no legal force, but moral suasion, peer pressure, as well as the quality of its opinions which reflect worldwide consensus on financial stability, are drivers for coherent implementation across sectors and jurisdictions. Some of its main political positions are endorsed by world leaders in the context of the G20 agreements.[15]

This confirms that financial stability is often a transnational issue which can only be dealt with within international cooperation. Specific activities dealing with sectoral financial stability issues are developed by the international regulatory bodies, especially by IOSCO and IAIS, regrouping the world's securities and insurance regulators.

At the European level, as part of the post-crisis measures[16], the European Systemic Risk Board (ESRB) was created with a view of allowing the central banks and supervisory authorities and the EU institutions active in the field of financial regulation[17] to develop macroprudential oversight within the European Union in order "to contribute to the prevention or mitigation of systemic risks to the financial stability (...) so as to avoid periods of widespread financial stress".[18] The Board's composition points to a strong priority given to issues in the banking and financial sector, as the main addressee of the post-crisis prudential measures.

The ESRB may develop supervisory actions addressing e.g. warnings or recommendations[19] to EU members states, the ESAs[20] or the national supervisors, who will inform the ESRB about their follow-up. If the latter is not convincing, the ESRB will issue an opinion to the addressees, i.e. the ESA concerned and the European Council, the European Parliament also being involved.[21] The warnings are confidential but the ESRB can release them publicly, informing the addressees in advance.[22] The ESRB has undertaken considerable work to better analyse the conditions under which an imbalance can be considered to become systemic. On the basic of a theoretical model entitled "The macroprudential stance", the ESRB has developed a detailed study on the notion of systemic risk focusing especially on the way to measure the latter on an ongoing, prospective basis.[23] The Board is assisted by an Administrative Scientific Committee and an Administrative Technical Committee, undertaking supporting studies to the ESRB positions.

Additional activity in this field is developed by the European Supervisory Authorities (ESAs). Their action is firstly focusing on observations, analysis and formulation of policy guidelines. They are involved in this process both at the general oversight level, monitoring and assessment of systemic risk, developing stress testing regimes and identifying the

13. FSB acts as a coordinating body; policies are not legally binding. See Work of the FSB, www.fsb.org/work-of-the-fsb/.
14. See: FSB, Key Standards for Sound Financial Systems**,** www.fsb.org/work- of-the-fsb/about-the-compendium-of-standards/key_standards/ priority implementation – presenting minimum requirements for good practice.
15. See for the G20 Japan meeting of June 2020, the statement on crypto-assets: "While crypto-assets do not pose a threat to global financial stability at this point, we are closely monitoring developments and remain vigilant to existing and emerging risks", further welcoming the FSB's and other standard setting bodies work on the topic.
16. De Larosière report, The High-Level group on Financial Supervision in the EU, 25 feb. 2009, www.ec.europa.eu/economy_finance/publications/pages/publication 14527_en.pdf.
17. Also take part: a member of the European Commission, the chairs of the ESAs, the president of the EFC, and of the EEA and EFTA.
18. Art. 3, 1., Regulation No 1092/2010 of 24 November 2010 "on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board" – "ESRB reg".
19. See artt. 16, 17 and 18, ESRB Reg. ESRB, A new database for financial crises in European countries, Occasional Paper, No 13/July 2017, www.esrb.europa.eu/pub/pdf/occasional/esrb.op13.en.pdf. See e.g. ESRB, Vulnerabilities in the residential real estate sectors of the EEA countries, 23 Sept. 2019; ESRB, Methodologies for the assessment of real estate vulnerabilities and macroprudential policies: residential real estate, 23 Sept. 2019; ESRB, EU Non-bank Financial Intermediation Risk Monitor 2019, July 2019.
20. European Supervisory Authorities, i.e. European Banking Authority, European Insurance and Occupational Pensions Authority, and European Securities and Markets Authority. The art. 458 CRR subject measures adopted by a Competent National Authority to a procedure involving the European institutions, EBA and ESRB. For applications s. nt 20, see: E. FERRAN and K. ALEXANDER, "ESRB as a soft law body", SSRN 1676140; also under the title: *Can Soft Law Bodies be Effective? Soft Systemic Risk Oversight Bodies and the Special Case of the European Systemic Risk Board*, U.Cambridge, Legal Studies Research Paper Series, Paper 36/2011, June 2011.
21. See EBA, Opinion following the notification by the French High Council for Financial Stability (HCSF) of its intention to tighten the large-exposure limits applicable to large and highly indebted non-financial corporations (NFCs), 14 March 2018, ESRB, Assessment of the French notification in accordance with Art. 458 of Regulation (EU) No 575/2013 concerning the application of a stricter national measure as regards requirements for large exposures, 9 March 2018, www.esrb.europa.eu/pub/pdf/reports/esrb.opinion180309_large_exposures.en.pdf. See EBA, Opinion following the notification by the French High Council for Financial Stability (HCSF) of its intention to tighten the large-exposure limits applicable to large and highly indebted non-financial corporations (NFCs), 14 March 2018, ESRB, Assessment of the French notification in accordance with Art. 458 of Regulation (EU) No 575/2013 concerning the application of a stricter national measure as regards requirements for large exposures, 9 March 2018, www.esrb.europa.eu/pub/pdf/reports/esrb.opinion180309_large_exposures.en.pdf;Opinion EBA-Op-2018-01)of the European Banking Authority on measures in accordance with Art. 458 of Regulation (EU) No 575/2013, on the Proposal from the Belgian Central Bank; Opinion EBA/Op/2017/15 relating to the Cyprus Central Bank. There are 309 of these opinions published by the EBA. EIOPA has also published numerous reports on macroprudential issues in more thematic substances. EBA issues Opinion on measures to address macroprudential risk following notification by Finnish FSA, 30 July 2019, www.eba.europa.eu/eba-issues-opinion-on-measures-to-address-macroprudential-riskfollowing-notification-by-finnish-fsa.
22. Art. 18 ESRB Reg.
23. ESRB, Features of a macroprudential stance: initial considerations, April 2019. The analysis is a theoretical exercise which defines the intensity of systemic risks in terms of the comparison between three components: the overall identified systemic risk ("gross risk"), the neutralizing factors due to available resilience of the system and the effect of the macroprudential policies. The remaining volume of systemic risk is described as the residual systemic risk, which is the subject of supervisory attention. www.esrb. europa.eu/pub/pdf/reports/esrb.report190408_features_macroprudential_stance_initial_considerations~f9cc4c05f4.en.pdf.

institutions which needs further follow-up, requiring stronger supervision, and where applicable, referring to recovery and resolution regimes, in accordance with the applicable EU regulations. EBA assesses the measures proposed by national central banks on macroprudential risk and issues further recommendations in this respect. At the same time, the ESAs will have to organize sufficient support capacity to respond to the occurrence of a systemic risk case, ensuring coherent and coordinated crisis management.[24] EIOPA has undertaken numerous studies on specific macroprudential aspects of the insurance regulation, while ESMA follows up on macroprudential evolutions in the securities markets, or analyses specific aspects of its supervisory activity.[25] One should also mention private bodies specialised in this field, such as the Systemic Risk Council[26], or the Systemic Risk Centre.[27]

In the US, the Financial Stability Oversight Council (FSOC) as part of the US Treasury monitors the stability of the US financial system. The Office of Financial Research (OFR) collects the data, analyses the long term trends and develops risk measurement and monitoring tools. It supports the work of the Council.[28] The FSOC has the authority to qualify non-bank institutions as systemically important financial institutions.

With respect to banks, located in the euro area, the national competent authorities – many of which are central banks – introduced macroprudential tools – capital buffers, countercyclical buffers[29], or other measures such as restrictions on real estate financing – relating to the banks subject to their supervision.[30] The ECB may object to these national measures or may impose higher requirements or more stringent measures[31], subject to a right of objection of the national supervisor.[32] Its decisions will be binding on the institutions to whom they are addressed. The ECB will conclude MOUs with the authorities of the non-euro states with respect to their systemically important institutions.[33]

One can summarise by stating that the attention paid to systemic developments and financial stability issues is very well developed both at the international, at the European level as in most other parts of the world. It has generally been effective in avoiding major crises after the 2007 GFC, continuing to closely monitor developments which could trigger a new crisis. However, as often remarked, this finding is not a guarantee that no new crisis could erupt.

III. FINANCIAL STABILITY IN THE NON-FINANCIAL SECTOR

While stability is one of the core objectives – or concerns – of the international and national financial regulatory and supervisory systems, no comparable developments have taken place outside the financial sector, i.e. mainly in industry or commerce. There can be little doubt that comparable widespread disruptions have taken place in several other segments of the economy, causing comparable disruption, but receiving less attention as often they were limited to a sector or to a country in particular. This difference can be attributed to several factors, among which the greater diversity of economic actors, each individual entity being less likely to trigger a massive crisis, while only few large firms would have the dimension to trigger system-wide developments. The level of interconnectedness is for most sectors of activity lower, contagion risks being reduced due to more widespread substitutability. But in the most striking cases,

24. See art. 22 to 24 EBA Reg; see art. 5, 7. BRRD; similar provisions apply in the insurance sector: 22-24 EIOPA Reg; in the securities fields; art. 22-24 ESMA Reg.
25. See ESMA, ESMA Report on Trends, Risks and Vulnerabilities, November 2, 2019, www.esma.europa.eu/sites/default/files/library/esma_50-165883_report_on_trends_risks_and_vulnerabilities_no.2_2019.pdf.
ESAs Joint Committee, Good Supervisory Practices for Reducing Mechanistic Reliance on Credit Ratings, 20 Dec. 2016, 2016,71: "The ESAs will not refer to credit ratings in their guidelines, recommendations and draft technical standards where such references have the potential to trigger sole or mechanistic reliance on credit ratings by the competent authorities ..." Reliance on credit ratings by the European Supervisory Authorities and the European Systemic Risk Board, 19 June 2019, www.esma.europa.eu/databaseslibrary/interactive-single-rulebook/crar/article-5b.
26. www.systemicriskcouncil.org, identifying itself as "a private sector, nonpartisan body of former government officials and financial and legal experts committed to addressing regulatory and structural issues relating to global systemic risk".
27. www.systemicrisk.ac.uk/about-centre, set up by the LSE and the ESRC.
28. See: www.home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/fsoc/studies-and-reports.
29. For an overview of the present status, see ESRB, Countercyclical capital buffer, and: Conservation Capital Buffer, www.esrb.europaeeu/national_policy/ccb/html/ index.en.html; ECB, Shelter from the storm: recent countercyclical capital buffer (CCyB) decisions, 27 March 2019, www.ecb.europa.eu/home/search/html/index.en.html?q =+countercyclical+buffer.
30. National central banks have made ample use of this instrument, see e.g. NBB, The Belgian macroprudential policy framework in the banking sector, www.nbb.be/doc/cp/eng/2017/the_belgian_macroprudential_policy_framework_in_the_banking_sector.pdf; Also: www.nbb.be/en/financial-oversight/macroprudential-supervision; Macroprudential instruments: their decisions will be binding on the institutions to whom they are addressed.
31. Art. 5 SSM Reg., 15 Oct. 2013.
32. Art. 5, 4. SSM Reg.
33. See SSM Regulation, art. 3, 6. and 7 for the non-participating states, and art. 8 for third countries; See MOU of ECB with the OFR, 30 May 2017, www.ecb.europa.eu/pub/pdf/other/MoU_ECB-OFR_concerning_consultation_cooperation_and_e xchange_of_information_201705.pdf; ESRB Recommendation of 26 September 2019 on exchange and collection of information for macroprudential purposes on branches of credit institutions having their head office in another Member State or in a third country (ESRB/2019/18).

interconnectedness was derived from the financial crisis, as a wider economic downturn was induced by the large mistrust in the financial system, triggering a "depression" (1920s) or a "recession" (in 2007 e.s.), broadening the systemic crisis to a wider economic downturn in the entire economic system. These differences may explain – but not justify – the lower degree of attention paid to economic stability in the non-financial sector.

Stability concerns in the non-financial sector cannot be identified on the basis of the same criteria as applied to the financial sector, where liquidity and related solvency issues are the most immediate triggers – although not the only ones – of stability concerns. Moreover, due to the diversity of the non-financial sector, not all disruptions will raise systemic or widespread concerns: one will have to focus on specific developments, gravely affecting production units and the employed populations, or disruptive incidents caused by the largest, economically most significant entities. The largest companies or the most significant public sector entities would be the principal candidates for this analysis and follow-up: they could be defined in terms of consolidated size, turnover, employees or their specific central role in the economy. Incidents occurring in such firms will in many cases involve their immediate stakeholders, being here understood as the investors, the employees, suppliers, creditors – leading to a related confidence crisis in the markets, or in the labour relations –, indirectly affecting the parties who have no immediate relationship with the firms concerned. Disruptions may not always be due to the economic sectors, direct victims of the crisis, but may have a social or environmental cause. This raises the question as from which level a major, destructive event or a collapse occurring in one or several firms or in one country will become relevant to other firms, whether in the same sector, or in the same State or even further away. The contagion, which is very visible in the financial sector – see the so-called "bank run" – is not unknown in the non-financial sector, but is less visible and might be more easily remedied. Moreover, the impact of some incidents is not always visible in the short term, and may only come to the surface and catch the public attention many years later, after the controversial production methods have been interrupted, or their effects cannot further be identified. Additional work has to be undertaken to develop criteria which would justify additional measures to be adopted by the companies concerned.

IV. DISRUPTIONS IN THE NON-FINANCIAL SECTOR: A FEW EXAMPLES OF POSSIBLE DISRUPTIONS

While the systemic crises due to financial instability are well identified and described, which are the equally destabilising factors in the non-financial segment of the economy?

A few examples should illustrate this proposition, under the proviso that the causal effect between events or incidents and the larger crises should be significant, but may not always be visible, at least in the short term. Also, it would be open to further analysis to what extent, large segments of the economy or society will be affected and if so, whether the initial events could have been qualified as economically relevant, and could have been predicted and remedied, or only after their occurrence, have triggered remedial measures. The OECD in its studies on "New Approaches to Economic Challenges (NAEC)"[34] identified four main factors causing instability in the economy after the GFC: environmental changes, technological developments, globalization and demographic changes. Policy objectives[35] should include "system resilience" being an "economy's ability to withstand financial, environmental or other shocks without catastrophic and system-wide effects".[36]

The following list of relevant systemic causes or events attempts to give a more concrete content to the notion of "systemic risk" for the non-financial sector, along with the requirement of considerable destructive consequences. These examples should merely identify the area of possible concern, as the causal effect between events or incidents and the larger crises should be further investigated.

It is sensible to start the list of economically relevant events with *climate change*, which is now attracting worldwide public attention and causing considerable concern. If the series of considerable disturbances which have hit several parts of the word will continue, it is likely that this evolution will upset the stability – financial and other – which economic and social systems impacted have known. But remedies are hard to find, even harder to put at work. Numerous initiatives are being presented worldwide, addressing the widest range of developments, both human and technical, under considerable pressure from the public opinion. Political reactions remain divided, some major states refusing to even recognize the phenomenon. Over time, the consequences are becoming increasingly visible, and will be extremely difficult to remedy.

Climate change triggers numerous destabilizing developments, gravely affecting the populations exposed. The agricultural sector is particularly prone to major incidents, putting the population and related economic activity at risk

34. OECD, *Broadening the perspective beyond the financial sector*. See: the regular updates at: www.oecd.org/naec/NAEC_Update_December_2019.pdf.
35. In addition to Environmental sustainability, Rising wellbeing, Falling inequality.
36. OECD, *Beyond growth: towards a new economic approach*, Report of the Secretary-General's Advisory Group on a New Growth Narrative, 17–18 September 2019, www.oecd.org/naec/averting-systemic-collapse/ SBOECD_NAEC_Beyond_Grow th_presentation_Michael_Jacobs.pdf.

such as farming, transport, export and further food production for society. Drought is making wide areas inhabitable, destroying segments of a country's agriculture and food supply at the same time leading to emigration of the population. Combined with widespread fires, the resulting smoke is being felt almost around the globe. Recently an increasing number of agricultural crises due to e.g. widespread drought, flooding, or invasive plagues have been reported, touching even places which previously were considered protected against any of these evils. Further effects of natural disasters should be mentioned such as the limited availability of food, poor distribution, and on a cross-sectoral basis, disturbances in transportation, tourism and related services. The ongoing COVID-19 crisis is another dramatic example.

Attention to this evolution, and to the wider environmental effects is now stirring active debate in the political but also the financial world. The IMF, the OECD[37], the European Commission[38], the European Central Bank[39], the Bank of England[40] and many other public and private institutions have elevated climate concerns to their top priority and indicating the different ways, each within its own sphere of action or influence, how they will contribute to improve the state of the world natural environment. But more broadly worldwide standards have been tabled by the United Nations, as Sustainable Development Goals (SDGs), based on the wider concept of "sustainability", now a widely adopted moral or even social criterion. In the economic field, it aims at the reduction of damage inflicted to society by mainly large companies in pursuit of short-term profits.[41] Part of the objectives is the avoidance of depletion of natural resources to maintain an ecological balance. The sustainability concept is not new: already in 1987, sustainability was defined as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[42] The concept has been further developed in many specific fields, even as binding standards, especially in the field of financial regulation. The European Commission includes sustainability elements in many of its financial regulations, e.g. on investment funds, pension funds, and other financial institutions. Private business also increasingly subscribes to these broader objectives of company actions.[43]

Agricultural diseases destabilize the food production in certain regions threatening the livelihood of farmers in several parts of the world[44]: a current plague eliminates centuries old olive trees in southern Italy; idem for the banana culture for the most exported bananas variety in Central America. One should remember the "Great French Wine Blight" in the second half of the 19th century due to Grape phylloxera, a tiny insect originating from N America, which destroyed the entire French wine culture, but benefitted the US wine production. Luckily since then, new vines have been planted! These disruptions often disturb many aspects of the population involved: health risks, food scares, poverty, but also commercial or industrial processes.[45] At the moment of writing, partly due to climate conditions, a locust plague is destroying crops in East Africa, threatening food security and an unknown coronavirus is destabilizing part of the Far East. While the African Swine Fever virus constitutes a threat to the food supply in China and a large part of the Far East.

The production of dangerous products have in many cases created significant risk to the population: asbestos 50 years

37. OECD, ESG Investing: Practices, progress and challenges (2020 forthcoming) with ESG data of equity issuers across Asia, Europe and North America.
38. See the programme presented by the Commission President Ursula von der Leyen in her opening Statement, 16 July 2019, www.ec.europa.eu/commission/presscorner/detail/en/SPEECH_19_4230. Commission, The European Green Deal, 2 Dec. 2019 www.ec.europa.eu/eip/agriculture/en/news/european-green-deal, covering all sectors of the economy; Sustainability and competitiveness are mentioned alongside.
39. See the inaugural speech pronounced by Christine Lagarde, new chairperson of the ECB. See: L. DE GUINDOS, Implications of the transition to a low-carbon economy for the euro area financial system, 21 Nov. 2019; ECB; M. SANDBU, Lagarde's green push in monetary policy would be huge step up, FT 2 December 2019.
40. See BANK OF ENGLAND, Surveys of the banking sector and M. CARNEY, Remarks on the launch of the Recommendations of the Task Force on Climate-related Financial Disclosures, 14 Dec. 2016; BoEngland, PRA review finds that 70% of banks recognise that climate change poses financial risks, 26 Sept. 2018, www.bankofengland.co. uk/news/2018/september/transition-in-thinking-the-impact-of-climate-change-on-the-uk -banking-sector; in general see: BoEngland, Climate Change, www.bankofengland.co.uk/climate-change.
41. United Nations, Sustainable Development Goals (SDG) 2015; "the blueprint to achieve a better and more sustainable future for all", www.un.org/sustainabledevelopment/sustainable-development-goals/.
See for a recent overview: Resolution adopted by the General Assembly on 15 Oct. 2019, www.undocs.org/en/A/RES/74/4; on the disclosure aspects: C. ADAMS, P. DRUCKMAN and R. PICOT, Sustainable Development Goals Disclosure (SDGDs) Recommendations, www.ifac.org/publications/sustainable-development-goals-disclosuresdgd-recommendations.
42. Brundtland Commission, Report of the World Commission on Environment and Development: Our Common Future, 1987,www.sustainabledevelopment.un.org/ content/documents/5987our-common-future.pdf*; St Held, Our common future, Pathways to 2050,* www.unece.org/fileadmin/DAM/ie/se/pp/EnCom15/28Nov/Sust Dev/HELD_SustDev_UNECE_EnComm 15_2006_c.pdf.
43. Commission Action Plan: Financing Sustainable Growth, COM/201097 final; COMMISSION LEGISLATIVE PROPOSALS ON SUSTAINABLE FINANCE www.ec.europa.eu/info/publications/180524-proposal-sustainable-finance_en, 24 May 2018. In several more recent proposals, similar ideas have been included. In May 2018, the Commission created a Technical expert group on sustainable finance, dealing with a EU taxonomy, (www.ec.europa.eu/info/sites/info/business_economy_banking_and_finance/documents/190618-sustainable-finance-teg-report-overview-taxonomy_en.pdf). Green Bond standards, Climate benchmarks, and climate related corporate disclosures. For the private sector, see: A fundamental reshaping of finance, www.blackrock.com/uk/individual/larry-fink-ceo-letter; see the critical comment in the FT, 15 Jan. 2020.
44. See: FAO in emergencies, leading in some cases to major humanitarian crises www.fao.org/emergencies/emergency-types/plant-pests-and-diseases/en/: FAO in emergencies.
45. See for an overview of cases in the US: 17 of the Worst Foodborne Illness Outbreaks in U.S. History; www.healthline.com/health/worst-foodborne-illness-outbreaks; in the EU. Parmalat, Lactalis (The Guardian, 14 January 2018), or Belgian Dioxine crisis, are well known cases among many.

after its use was forbidden is still making victims, and numerous legal cases are still pending in court.[46] Medicines which have not be adequately tested have left parents in despair with so-called "Softenon"[47] babies, a lifelong concern. And the recent opioid crises in the US and elsewhere remind us of the destructive force of the uncontrolled production and distribution of these drugs. The US Food and Drug Administration and the European Medicine Agency prevent dangerous products to being officially distributed.[48]

In the technological fields, "Diesel gate", detected almost by accident, is having a profound impact on mainly the European automobile production, but also on the distribution systems, on employment in part manufacturers, but also on their moral standing in society. There is controversy whether some producers were aware of the harmful consequences of their combustion engines. Adjustments of the product range – e.g. the success of electrical cars, or the use of new sources of energy, hydrogen e.g. – may affect the historical position of the former leaders, with visible effects on their financial position, leading to restructurations and lay-offs.[49] Changes in power supply, but also in transportation modes are already resulting, threatening the future of even the most successful former car manufacturers. Indirectly, production of spare parts in unrelated countries may also be suffering.

The information technologies confront our societies with unprecedented challenges in terms e.g. of confidence building, or reliability, introducing new factors of distrust and considerable instability in our social networks[50], or even as instruments equivalent to military weapons. Social media strongly contribute to the polarization of our societies while "cyber risk", artificial Intelligence[51] or robotics – to name a few – point to other radically destabilization factors if used for the wrong purpose.[52] At the same time, the number of industrial incidents due to IT interferences is quite considerable, contributing to overall instability but also inflicting considerable damage to firms or individuals, even disrupting production processes.[53] Some IT firms, especially the GAFAs mainly have become excessively dominant players not only in IT in general, but more specifically in telecommunication, commerce, even banking, fundamentally changing distribution techniques, but also resulting in considerable privacy deficits, or even political manipulation. Firms should be alarmed about these developments and consider how to defend their position.

In the field of air travelling, another instability factor due to safety fears has manifested itself: while air travel is becoming more and more common, travellers are being confronted with fears about the safety of their trips, e.g. due to defects identified on some airplanes, resulting in deadly accidents, or in an increasing number of planes being grounded.[54] Pollution motivates travellers to prefer alternative modes of transport, especially for shorter distance trips. Although unlikely to change long-distance travellers' behaviour, these defects should modify production and safety oversight, changing the competitive position of producers, but may also affect mass tourism. The sudden financial collapse of a travel agency created considerable disappointment to the travellers who have been left behind abroad.[55]

Finally, Brexit seems to be the example of an unpredictable financial and economic instability risk, possibly containing triggering factors with a systemic dimension, unless for decisive interventions of the public authorities.[56] At the moment of writing the insecurity could be said to be prevalent[57] while

46. See: www.mesowatch.com/legal/. In other fields, state control agencies follow up on applicable regulations: e.g. building permits, exploitation authorisations.
47. The medical name is Thalidomide. Contergan is another name under which product was distributed. The thalidomide disaster led to a considerable strengthening of the rules for testing drugs, and the requirement of formal licensing.
48. European Medicine Agency (EMA), re-Authorisation Evaluation of Medicines for Human Use "On the environmental risk assessment of medicinal products for human use" 1 June 2006, mentioning i.a. that "sewage system is the main route entry of the drug substance into the surface water." See for further information: www.ema.europa.eu/en/search/search?search_api_views_fulltext=environmental%20risk. EMA "Guideline on the environmental risk assessment of medicinal products for human use", 15 Nov. 2018, www.ema.europa.eu/en/documents/scientific-guideline/draft-guideline-envi ronmental-risk-assessment-medicinal-products-human-use-revision-1_en.pdf.
49. Lay-offs in German car industry is reported to exceed 50.000 (2019).
50. See the damage inflicted in many institutions and companies by "hacking" "malware" or other abusive software or uses (fake news).
51. See: Center for the Study of existential risk, University of Cambridge, www. cser.ac.uk/research/risks-from-artificial-intelligence/.
52. These factors received ample attention for their effect in the financial sector. But they are equally important for the industrial and commercial sectors. At the same time, new forms of criminality appear, such as hacking, corruption and money laundering, changing the overall statistical patterns of criminality.
53. The best-known cases are Kodak and Nokia, producers of at that time efficient devices, but overtaken by competitors' disruptive technologies, almost leading to their producers' demise. Scott D. Anthony, Kodak's downfall wasn't about technology, Harvard Business Review, July 15, 2016; Comp David J. Cord, The Decline and Fall of Nokia, 2014. In both cases, management was not sufficiently aware of upcoming innovations.
54. The knowledge of some of these defects considerably affects user's confidence, both in the construction process and the official safety oversight. See European Civil Aviation Authority or EASA, in charge of certification, regulation, and standardisation of airplanes and parts, but also performing investigation and monitoring. The legal basis is Regulation (EU) No 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency.
55. In the 2019 "Thomas Cook" bankruptcy, 150.000 travellers out of 600.00 were stranded abroad. The UK government intervened for their repatriation, at a cost for the UK taxpayers of about GPB 100 m. A shortage of funding seems to have been the cause. The effect on employment is also to be considered, See: www.skyrefund.com/en.
56. See ESA, Joint Committee on Risks and Vulnerabilities in the EU financial system, August 2019.
57. See the Brexit related Yellowhammer report, 2 August 2019; not publicly available, outlining a series of 'reasonable worst-case planning assumptions", BBC news 13 Sept. 2019.

it remains unclear in which fields major developments will show up.

This short overview of a few examples of non-financial instability factors illustrate that instability in the economic systems goes much wider than the ones which have been identified in the financial sector. A further question – and the politically most important one – is whether instruments to identify these risks and possibly to reduce their impact, can/could have been developed. Have the business firms or other actors involved, paid attention to the potential risks, and have they undertaken action to prevent them?

On purpose, wars or wide civil unrest in so many parts of the world has not been mentioned as these can be regarded as the ultimate destabilization factor and often do not allow victims to develop a risk reduction attitude, except leave their country.

V. How crises in the financial v. the non-financial economy differ

Comparing large or systemic crises occurring in the financial field as compared to the non-financial economy presents different characteristics. Even without any actual threat, the former receive considerable attention: preventive instruments of different kinds have been developed in case the crisis would become directly menacing with interventions by the public authorities being activated once the crisis becomes alive.[58] Very few of these instruments have been developed for non-financial crises: apart from some early warnings depending on the causes of the crisis, remedies have mainly consisted of ex-post government support[59], insurance coverage or similar protection instruments. A comprehensive reflection is therefore appropriate.

One of the striking differences between both fields of activity is the strong presence of an external oversight regime in the financial sector, identifying and monitoring potential risks, including their unpredictable contagion effects, such as bank runs.[60] For the non-financial sector, no similar risk-focused mechanism has been developed. But this does not mean that there is no external monitoring: it takes several forms and pursues different objectives, some with direct relevance to the continuity of the firm. The products or services produced by some non-financial firms are the subject of a quite intense follow-up, often defined and regulated by public regulations and inspections. This is most striking for the quality of food, but also for the safety of products as electrical appliances, cars, medicines, airplanes, public constructions, etc. many of which are subject to *ex-ante* certification. In other cases, some different types of "oversight" apply to the business risks or more precisely to their impact on the overall prospects of the firm: the action developed by the credit rating agencies based on the publicly disclosed information, is aimed at guiding investors' decisions, but indirectly reflects on the firm' business decisions.[61] A similar influence is exercised by large investors in the context of investor engagement, or in a more directional orientation, by activist investors. Proxy advisors exercise influence mainly on governance decisions.[62] The press also influences company conduct, especially in cases in which flawed or scandalous conduct is revealed. In the context of the comply-and-explain regime, companies will have to disclose certain elements of their risk policies in their corporate governance statement.[63] All these factors contribute to disciplining companies' behaviour.

58. See European Stability Mechanism which provides financial support to eurozone governments or to ailing banks (by recapitalisation) . The ESM is proposed to become the European Monetary Fund, www.europarl.europa.eu/RegData/etudes/BRIE/2019/635556/EPRS_BRI(2019)635556_EN.pdf.

59. See the measures adopted by the legislator to reduce the harm inflicted in case of closure of large factories: in case of collective redundancies, the legislature may require a procedure to clarify the consequences for the employees, start negotiations on redundancy payments, but mainly open ways for replacement: See Belgian law 13 feb. 1998, 62 tot 69, first applied in the context of the closure of the Renault factory; comp for France: loi Florange, 29. March 2014, where a similar regime was developed, requiring the companies deciding to inform the employees or to search for another party, to acquire the firm. Also, some tax accommodation may be granted to the firm's victim of a major setback.

60. See the extent to which stock exchange prices move in a synchronised way.

61. See the role of ratings for ECB decisions: the Eurosystem credit assessment framework (ECAF) www.ecb.europa.eu/paym/coll/risk/ecaf/html/index.en.html; changes in ratings have a direct influence on the pricing of the shares of the rated company: see Chr. FLOOD, ESF Controversies wipe 500bn off value of US companies, FT 14 Dec. 2019, as ESG rating is one of the most relevant metrics for future earning or volatility. Credit ratings agencies include ESG in their ratings: see e.g. EG in Credit Ratings – S&P Global Ratings, www.spglobal.com/ratings/en/products-benefits/products/esg-incredit-ratings. See also nt. 24.

62. On proxy advisors, see: SEC Proposes Rule Amendments to Improve Accuracy and Transparency of Proxy Voting Advice, 5 November 2019, www.sec.gov/news/press-release/2019-231; ESMA, "Best Practice Principles for Providers of Shareholder Voting Research and Analysis", 18 Dec. 2015, ESMA, 2015, 1887. *F. Placenti* and S.W. RUEST, The SEC's Evolving Views Regarding Proxy Advisors, Harvard Law School Forum on Corporate Governance, 23 November 2019 www.corpgov.law.harvard.edu/2019/ 11/page/2/.

63. See the UK Stewardship code 2020: The introduction to the Code recognises that asset owners and asset managers play an important role as guardians of market integrity and in working to minimise systemic risks as well as being stewards of the investments in their portfolios. Reporting should include "setbacks experienced and lessons learned, as well as successes" p. 6 and on p. 4 "Respondents should explain how they have responded to market-wide risk and systemic risks as appropriate". Comp. UK Corporate Governance Code 2018, Ch. 4. For an overview, see Ecoda, Corporate Governance Compliance and Monitoring Systems across the EU, Oct. 2015 www.ecoda.org/wp-content/uploads/2019/08/20151009_CoE_Conference_Final.pdf; www.guberna.be/sites/default/files/pubs/31719_EcoDa_CGC_report_v2.pdf; Accountancy Europe. Ten Ideas to make corporate governance a driver of a sustainable economy, June 2019.

In non-financial companies, the consideration of the longer-term risk profile and of the specific dangers to the future of the business will take place internally in the companies' board: this discussion will include the risks relating to the continuity of the business, its long-term competitive position, its leadership and its management efficiency, its future financial position in terms of returns to stakeholders, its solvency[64] and its long-term expansion, its wider economic role and position in the business sector concerned. Any such action would necessarily remain within the decision-making discretion of the company's bodies, ultimately its board of directors, irrespective of whether the resulting risks would be limited to the firm itself, will affect its direct stakeholders, or touch upon the wider society.[65] In all these cases there would not be external monitoring or oversight except by way of review of voluntary disclosures, whether pursuant to governance codes or not. In principle, the consequences of the relevant decisions will be exclusively borne by the company. Exceptionally, external relief may apply e.g. allowing for employee exit management[66], or in some cases by providing financial support from an external fund or from a public institution.[67] The differences with the financial sector are striking: in case of serious financial difficulties, public intervention in favour of banks or of their depositors is organized by the law itself.[68] One of the resolution measures consists of a mandatory transfer of assets or even a merger: (it can be voluntarily practised by non-financial entities), while for financial institutions, measures of this kind would be mandated by supervisory authorities.

For the non-financial sector, remedies have to be sought in the organizational rules of the company affected, its governance rules and procedures, the applicable rules on accounting and auditing, and ultimately in the applicable bankruptcy or insolvency regime.

In the absence of external monitoring, the related risks will be treated under the heading of the responsibility of the board, calling for appropriate internal actions by the board: streamlining the production lines, restructuring the internal organization, or repositioning in the relating markets, changing the business model may all be adopted by board decision, while more fundamental decisions such as a change in the legal or financial structure, a merger or a split up will be initiated by the board, but are ultimately subject to shareholder approval. Decisions of this nature will be driven by considerations about the company's risk profile and its long-term perspectives. In large groups, these decisions which often have very wide consequences, affecting a large range of third parties and sometimes society in general.[69] In that sense, they could be referred to as "systemic". The investors, stakeholders, employees and society at large will be the victims, or as the case may be, the protected beneficiaries.[70] In this decision-making process, the board will be the key player, and this without any external monitoring. No external authority will guide the board as, ultimately the market – financial or product markets – will be the final arbiter. From the legal point of view, company law will play a decisive role in this decision-making process.

1. The role of company law

In the absence of an organized external monitoring device, the responsibility for dealing with severe crises lies with the company's decision-making bodies and is governed by company law rules. Company law will determine how decisions are adopted, who will be responsible – e.g. in one- or two-tier boards –, the role of the external audit and of the general meetings – and which forces will influence the company's long-term policies. In the boards, representatives of public or major shareholders and independent directors will decide on the risk profile of the firm, based on the firm's business model, its expansion and product range. In some jurisdictions, representatives of employees or of major creditors will become particularly important interlocutors in case a serious crisis can be expected. Decisions are adopted on the background of the generally applicable regulatory framework, determining the firms' position in its State of location: tax, accounting and auditing rules, corporate governance codes, but increasingly environmental rules e.g. will determine its

64. As there is no officially organized monitoring of the solvency risk for non-financial firms, possible remedies intervene often too late, rendering the bankruptcy inevitable, exposing the directors to "wrongful trading" (s. 214 Insolvency Act 1986) and massive layoff of employees. The role of the auditors calls for special attention as they should be able to detect an insolvency threat.

65. Many large companies subscribe to climate related objectives, and have issued green bonds, IMF, Beschloss and Mayshayekhi, A Greener Future for Finance, F & D article, 2019 www.imf.org/external/pubs/ft/fandd/2019/12/green-bonds-offer-lessons-for -sustainable-finance-beschloss.htm, also mentioning the dubious players. OECD, Green bonds, Policy perspectives, Mobilising the debt capital markets for low-carbon transition, December 2015. Bank of England to disclose assessment of how it manages climate-related financial risk, 17 April 2019; www.bankofengland.co.uk/news/2019/april/boe-todisclose-assessment-of-how-it-manages-climate-related-financial-risk; BoE, Transition in thinking: The impact of climate change on the UK banking sector, 26 Sept. 2019.

66. See the Belgian and the French law, *supra* nt. 58.

67. See the support of the US auto industry: in 2007 in the US, the government bailed-out the auto industries GM and Chrysler, which were nationalised along with several financial institutions, by drawing on a government fund, created under the Troubled Asset Relief Program. See Auto Industry Bailout, www.thebalance.com/auto-industrybailout-gm-ford-chrysler-3305670. In many states, there have been similar but less overt interventions, e.g. in the airline industry. In some cases, the promise of government support may lead to moral hazard, influencing risk taking.

68. Reference can be made to the Directive No 2014/59 of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms (BRRD) and its equivalent euro area instrument Regulation (EU) No 806/2014 of 15 July 2014 (Single Resolution Mechanism). A resolution fund will be provided by the banks on a collective basis. See for the role of the ERM, nt. 59.

69. See the massive layoffs due to automation of production processes, or on the distribution of products by e.commerce.

70. See the classes of protected depositors or employee under the BRRD, art. 44.

position on the market and may in some cases even lead to relocation. The board will identify, analyse or act on the identified risks, adopting appropriate internal actions: changing the business model, streamlining the production lines, restructuring the internal organization, or repositioning in the relating markets. This also applies to fundamental decisions which have to be adopted by the general meeting, like changing the legal or financial structure, issuing additional shares, mergers and divisions, reorganizations. In each stage of the decision-making process, company law plays a decisive role. In some instances, the court may intervene: in bankruptcy proceedings, the courts will verify whether the decisions including proposed distributions meet the legal requirements. This may also be the case for some mergers, or reorganizations.[71]

Decisions of this nature will be adopted by the sole board and will have a considerable impact on the risk profile of the company and on the position of investors, stakeholders and society in general.[72] It is up to each firm to analyse the risks it wants to be exposed to, its "risk appetite" and adopt the necessary measures to control them, or if not possible, provide protection for the negative consequences thereof. All these maters will be decided by the company's governance bodies, deciding in accordance with the applicable regulatory framework, on the basis of the relative pros and cons, including the related risks. Firms which abstain from identifying their major business risks should be considered deficient and therefore responsible for the damages inflicted to the victims of their negligence.

Within the applicable legal systems, it especially belongs to company law to offer the internal framework within which business developments and accompanying risks will be identified and dealt with. "Company laws" should be defined as the wider concept relating to the rules governing the functioning of companies, especially including governance – and the applicable legal provisions, codes and practices – but also taking into account the group or shareholder structures, local traditions, historical or even environmental factors which constitute the setting of actual decision making. As especially large firms are viewed here, one should also mention the influence of the political world and the attitude of the banks as financiers. For listed companies, financial market regulations, requiring mandated or voluntary disclosures, public shareholder meetings, proxy regulation and activist investors will further modulate – sometimes decisively – these companies' decision making. Several of these factors are core ingredients as to how a company sees its ultimate objective, including its risk profile and its societal position. The evaluation of the risks, on the short and medium term, as undertaken by the board, will lead to conclusions on the long-term stability of the firm, its continuity and possibly its chances of survival. In some cases, questions will arise as to the wider impact of the firm's decisions, especially of its failure: will it only affect the direct stakeholders, or also the wider economy, create considerable tensions with its investors in the markets, trigger serious unrest from the employee side, which may ultimately result in social unrest. Might this result in instability comparable to the wider instability due to systemic failures?

Different from the external monitoring applied to financial institutions, the monitoring function in non-financial institutions is largely internalized at board level, and is directly related to the financial and organizational requirements flowing from company law: among these, one could mention the own fund requirements, the responsibility of the company for its continuity with respect to its functioning and its solvency[73], the availability of support from the shareholders. Although not comparable, one could state that company law and organizational rules play a role which to a certain extent is comparable to the one played by the financial stability regime. The main difference is that the decision is largely in the hands of the board and that little *ex-ante* or external oversight is applicable, weakening the board's position in case of a major crisis.

This line of thinking leads to the question whether – and to what extent – individual companies or groups and the individual members of their boards have to assume responsibility for wider economic stability issues. In the financial sector, this question is formulated in more strict terms: should the board be responsible for not having adopted timely action to prevent systemic risk? In finance, this task is largely shared with the responsibility of the supervisory authorities, who collect market wide data, have a deeper insight in the recovery plans clarifying the risk positions of the individual group entities and their interlinkages. Individual liabilities may be related to excessive or unjustifiable risk taking, leading to moral hazard. Some of these elements may be applicable to the non-financial firms as well. The identification of wider instability risks is not a first line task of their governance bodies: overall instability in the economy may be very difficult to predict, such as a major financial crisis, or a sudden disruption of the international trade. This should not prevent more specific sources of risks to be identified, and if possible, counteracted on. Unfavourable developments in the commodity markets can be avoided by taking derivative positions or building up reserves in support of future activity. But depending on the circumstances, vigilance will be advisable and boards should be attentive to ways to avoid possible disruption in their own business activity.[74] Boards should timely

71. See on these and similar transactions, ECLE, The Commission's 2018 Proposal on Cross-Border Mobility – An Assessment, Sept. 2018, European Company and Financial Law Review 16 (1-2): 196-221; M. Winner Protection of Creditors and Minority Shareholders in Cross-border Transactions, ECFR, 2019, 44.

72. See the massive layoffs due to automation of production processing, or changes brought about by the e-distribution for products.

73. See the Going concern requirement, as a basis for the company's accounting basis. ISA, 480 does not contain a requirement on this point.

monitor their financial and business position, and take early action, e.g. negotiating a refinancing deal with a group of banks, or agree to a sale of assets or when inevitable apply for a judicially approved rescue plan.[75] Inaction or refusal to consider certain solutions may be qualified as negligence, implying liability for those having refused to accept a solution in the interest of all concerned. Closing down the business would be the last inevitable approach, often destroying the reputation and the goodwill of the firm, and maximizing the damage for the unsecured creditors. In some case, especially to protect the employees, or to safeguard the brand of the company, public authorities have been willing to grant financial and other restructuration support[76], allowing over the longer term the firm to continue its business activity. A comparison with the recovery and resolution phases in banking regulation is striking.

From the legal point of view, one could qualify these duties as a strong version of the overall duty of care, including the "prudent management requirement".[77] It would be based on applicable company law.

2. The governance structure

Within the above outline of applicable company law, company decisions frame the different actions in which the company will engage, and the relating risks viewed from both a short and a long term perspective. The long-term policies and relating decisions are adopted by the board of the company, implemented by its executive management. The board, with the approval of the shareholders will express the companies' view on its future position, its long-term objectives within the context of the society in which it functions, including the impact it will have on the latter.[78] This leads to a reflection on whether the pursuit of profit, exclusively in the interest of the shareholders-investors, is the only company objective, as was for a long time considered by many, or whether that objective should be balanced against its responsibilities towards its different stakeholders, including the wider society in which it operates. The latter idea is often summarized as the company's corporate social responsibility, including specific Environmental, Social and Governance objectives (ESG). In legal terms, companies are invited – or even obliged[79] – to themselves formulate their views on the main objectives pursued by their actions, under the heading of the "corporate purpose", expressing in the corporate charter how they consider their objectives and their relationship with their different stakeholders.[80]

In financial institutions, with respect to significant risks the boards are held to specific regulatory obligations and risk monitoring should be one of the core concerns in all financial institutions. This requirement leads to an advanced system of risk identification and management, undertaken in the mandatory "risk – monitoring – committees" composed of independent directors with specialized risk experience, with attributions for general or specific risks types[81], and, more in general, attention to spill-over effects of risks in the markets.[82] A specialized executive director (CRO), member of the risk committee, is in charge of identifying and tracing the development of risk in the company, report on these to the executive leadership suggesting the appropriate remedies. Final decisions on major risks matters are part of the responsibility of the full board. Special reports have to be submitted to the supervisory authorities dealing with the general risk landscape in a given jurisdiction. Risk monitoring is one of the core concerns in financial institution.

74. And adopt the necessary provisions to cope with potential disruptions. So e.g. should firms protect themselves against massive interruptions of power supply. Recent cases in which firms were surprised by a sudden considerable liquidity or solvency shortage may point to their negligence, leading to their implosion: See the Woodford case in the UK.
75. In many cases this will allow to protect the firm's reputation and goodwill, necessary for restarting the activity.
76. See nt. 66. Small companies may still receive government support, but the larger ones would fall under the EU competition rules.
77. Liability for excessive risk, see: Bainbridge, Stephen Mark, *Caremark* and Enterprise Risk Management (March, 18 2009). UCLA School of Law, Law-Econ Research Paper No. 09-08. SSRN: www.ssrn.com/abstract=1364500. Compare the cases where excessive risks can lead to systemic consequences: e.g. an overheating real estate residential market, a major destructive agricultural development, a risk of flooding due to the rupture of a dam, an infectious disease.
78. Business Roundtable Redefines the Purpose of a Corporation to Promote 'An Economy That Serves All Americans' August 19 2019: "Updated Statement Moves Away from Shareholder Primacy, Includes Commitment to All Stakeholders".
79. Most requirements on company purpose are formulated in corporate governance codes: see UK corporate governance code: principle 1B "BOARD LEADERSHIP AND COMPANY PURPOSE". "The board should establish the company's purpose, values and strategy, and satisfy itself that these and its culture are aligned." Comp. UK Stewardship code, for Asset Owners and Asset managers, principle 4. The UK Corporate Governance code is more modest on these wider interests: "generating value for shareholders and contributing to wider society" as elements of the company's purpose.
80. Section 172(1) of the UK Companies Act 2006 defines a director's duty "to promote the success of the company for the benefit of its members as a whole", while having "regard to" various other stakeholder interests. See Colin MAYER, The future of the Corporation, Economy and Society, 2018. The Business Roundtable focused also on the interests of the shareholder and other stakeholders within the ambit of the company's decision making, but has been more timid in defending societal objectives as climate change, or combatting inequality: there was no mention in its 2019 statement, while some previous statements on global warming were not currently accessible. Business Roundtable Redefines the Purpose of a Corporation to Promote "An Economy That Serves All Americans" 19 August 2019, www.businessroundtable.org/business-roundtable-redefines-the-purpose- of-a-corporation-to-promote-an-economy-that-serves-all-americans, The reformulation of the purpose was approved by 200 CEOs.
81. FSB has published many statements on cyber issues. See FSB: Reports consider financial stability implications of BigTech in finance and third party dependencies in cloud services, 9 Dec. 2019; FSB, Guidance on cyber resilience for financial market infrastructures June 2016; FSB, Cyber Incident Response and Recovery Survey of Industry Practices, 8-9 June 2019.
82. AML-CFT was mentioned among the global stability issues in the 2019 FSB message to G20 Finance Ministers and Central Bank Governors, www.fsb.org/wp-con tent/uploads/P 131019.pdf.

Similar concepts apply to the non-financial sector. The UK stewardship code recognizes that "asset owners and asset managers play an important role as guardians of market integrity and in working to minimize systemic risks as well as being stewards of the investments in their portfolios".[83] In non-financial companies, risk assessment and monitoring are undertaken internally, essentially by the management, reporting to the board. In the better practice, risks committees composed of non-executive directors draw the boards' attention to the different components of the business risks, based on well-established risk assessment methods developed in parallel to the audit committee. However, boards are not always alert to risks threatening the core substance of the company, especially those arising beyond the time horizon of the current activity: the rapid evolution due to changes in the market structure, or due to product innovations[84] have surprised more than one entrepreneur, e.g. in the distribution sector.[85] The new risks generated by the increased use of IT and other technological tools are much feared, but if fundamental changes to the business model are likely to result, are not always well responded to.[86] Companies often do not routinely undertake a systematic or quantified risk identification and risk analysis exercise, nor investigate which and where the risks may have been generated, especially when dealing in international markets. Reduced attention may suffice, especially when the present product or activity range or production process do not give rise to specific immediate concerns. It is striking that corporate governance codes often deal with risk identification in a general way as part of the internal control systems, or as part of the task of the audit committee and not as a separate function. Remunerations is a subject dealt with in great detail, but the relationship with risks, even systemic risk is rarely mentioned.[87] A similar development may take place when excessive remunerations are granted: these incite staff to take greater risks.

Once risks have been identified, it is the task of the board to analyze them, assess their probability and potential damage, provide for adequate alternatives, especially for risk prevention, and if the risk materializes, mitigate its more destructive consequences. In some cases, it is striking how significant risks could easily have been identified and even combatted if a timely active analysis had been undertaken.

Large companies should arm themselves with efficient surveillance and detection instruments to prevent not only their financial losses, but also to avoid major harm to their stakeholders. Insurance coverage could reduce the impact of some deficiencies, but the reputation damage will remain.

This analysis leads to the proposition that the larger – both financial and non-financial – companies should structure their governance with a view of developing a solid risk management, run by specialized risk managers, reporting to a risk committee[88], to be organized within the board and in charge of determining the risk profile "in accordance with the institution's business model and risk strategy".[89] While in financial companies, a regulatory requirement addresses strict risk management of which the outer bounds are constrained by external supervisory intervention, in the non-financial entities, there are no such limits, no enforcement mechanisms the boards having to voluntarily determine the company's risk sensitivity expressed in KPIs, taking into account the overall business purpose. Company law rules and practices, along with governance codes[90] could define the individual limits of acceptable risk sensitivity, while a related duty to mitigate could be developed. Today, too many companies are not sufficiently sensitive to their risk exposure.[91] The company's charter should as a rule contain a clause drawing attention to the directors' obligation to identify, analyze and prevent major risks which may destroy or seriously harm the company. Boards should justify their

83. UK Stewardship Code, 2020, Introduction, stating that "Environmental, particularly climate change, and social factors, in addition to governance, have become material issues for investors", www.frc.org.uk/getattachment/5aae591d-d9d3-4cf4-814a-d14e156a1d87/Stewardship-Code_Dec-19-Final-Corrected.pdf. The Corporate Governance Code requires the board to assess risk, both emerging and principal risk, the latter defined along lines which come close to systemic risks (28).

84. See the *Kodak* and *Nokia* cases, nt. 52.

85. E.commerce, combined with efficient delivery methods, has substantially modified the distribution sector, and constitutes one of the predictable challenges. See E. SIMPSON, High Street: How many UK shops have closed? BBC 23 Oct. 2019.

86. New types of risk relate to the use of IT in business, leading to different types of abuse or fraud, in some cases equivalent to theft. Idem with counterfeit products e.g. medicines, counterfeit consumer goods, clothing or fashion products, or abuse with payment cards.

87. See on remuneration: French AFEP-Medef Code, 17 and 24; Swiss Code; Belgian Code, Principle 7; Deutsche Corporate Governance Kodex 2020, with comments by HOPT and LEYENS,ZGR 2019,974 e.s. But very few code provisions link remuneration to risk policies, eg. when high remuneration incentivises to pursue risky policies: A. BAILEY,Culture in financial institutions: it's everywhere and nowhere, www.fca.org.uk/ news/speeches/culture-financial-institutions-everywhere-nowhere. See H. MEHRAN, A. MORRISON and J. SHAPIRO (2012), "Corporate Governance and Banks: What Have We Learned from the Financial Crisis?" in M. DEWATRIPONT and X. FREIXAS (eds.), *The crisis aftermath: new regulatory paradigms*, CEPR. See FSB, *Implementing the FSB Principles for Sound Compensation Practices and their Implementation Standards,* Fifth progress report, 4 July 2017.

88. This function is often assigned to the audit committee. Does this lead to a more accounting led approach to risk?

89. As this is stated in CRD IV Art. 76 (3). See the UK Corporate Governance Code, 1.C "The board should also establish a framework of prudent and effective controls, which enable risk to be assessed and managed."

90. See UK Corporate Governance Code 4.O "The board should establish procedures to manage risk, oversee the internal control framework, and determine the nature and extent of the principal risks the company is willing to take in order to achieve its long-term strategic objectives." And in 28 "The board should – annually – carry out a robust assessment of the company's emerging and principal risks" and publicly report on it. In a further comment, the Code defines "principal risk" as relating to the specific position of the company. See 2016 Dutch corporate governance code, www.mccg.nl/download/?id=3367, referring to risk in many sections, requiring an internal risk management, control system, and accountability. The board should pay special attention to risks for the continuity of the company. In the Belgian Code risk management is a more central objective.

91. Evidence can be found in the high amounts of hacking and blackmailing due to "malware", "ransomware", "wannacry" and other similar abusive software.

action with respect to the major present and future risks which the company may be exposed to, and if possible mention the remedies which it could consider, thereby testifying to their risk awareness. The increasing public interest and attention will require companies, pursuant to whether statutory provisions, corporate governance code, or audit requirements, to display a clearer picture of its risk profile, and of the instruments to combat possible negative consequences. Benchmarks will synthetize the achievements companies are making in these fields – especially in environmental issues – and these could serve as enforcement instruments which are otherwise failing. Ultimately these processes will be largely governed by company law techniques, putting into play the responsibility of the directors.

Further pressure will be exercised by investors, action groups and other socially interested parties. Investors are likely to be paying more attention interested by the collective economic risks, while a wider public will be more interested by issues as climate risk, a field in which benchmarks[92] or similar instruments[93] are being developed which could be used as points of comparison before decisions are adopted.

This does not imply that sector-wide analysis would not be useful as far as the identification of preoccupying economic developments is concerned, an action which is already undertaken by the economic and monetary bodies following up and analyzing the evolution of the national and international economies. The outcomes of this analysis is an important contribution to the risk evaluation by individual firms, worldwide or in individual jurisdictions.

Apart from these company based initiatives, sector wide analyses would be very useful in support of the individual efforts in risks analysis. As far as the identification of preoccupying economic developments is concerned, the action undertaken by the economic and monetary bodies mentioned above are indispensable contributions to the risk awareness and evaluation by the individual firms.

3. The role of the auditors

Special attention deserves the role of the external auditor as he is the only external party with in-depth knowledge of the company's affairs and professionally bound to independence and scepticism in analyzing the business' accounting.[94] At first sight his role seems largely technical, i.e. convey reasonable assurance that the accounts, as prepared by the management, give a true and accurate view of the activity and the financial position of the company and this in accordance with the applicable accounting and auditing standards. His role can be compared to the independent external assessment undertaken by the financial authorities for the financial institutions, with the important proviso that the auditor's role is to convey reasonable assurance to the accounts.

This description of the auditor's role does not mean that the auditor does not look into the business risks and their effect on the overall continuity of the business. Decisions on the accounts, e.g. in terms of valuation and subsequent provisioning for the different types of assets – claims on clients, non-performing loans, goodwill – will be undertaken with a critical view, with a "sceptical mindset" including on business risks. The auditor's conclusions may have a significant impact on the company's overall health and expectations. If he identifies weaknesses in the internal accounting organization, or deficiencies as to the board's risk assessment, the auditor will have to include an appropriate comment in his report to the board or in his published report.[95] The auditor is not in charge of making an overall assessment of the company's health and business prospects, but in cases in which the risks or deficiencies so incurred would have come to his attention, especially if these shortcomings would prevent the company to continue its operations – for banks the BRRD criterion is that the bank "will fail or is likely to fail"[96] –, the auditor should express his opinion by making a comment about the company's continuous functioning for the next year.[97] In many jurisdictions, the auditor should include in his report a statement on the company's "going concern", which – if negative – may in fact be a summons to the management to adopt radical reforms and in the reverse case that it considers that the company's future is not endangered, its financial position being likely to be restored to normal. This requirement is laid down in the company laws, or the accounting rules of many jurisdictions. It is still under consideration whether it should be formally included in the international standards on auditing.[98]

92. TEG Final Report on Climate Benchmarks and Benchmark's ESG Disclosures, September 2019, www.ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/190930-sustainable-finance-teg-final-report-climate-benchmarksand-disclosures_en.pdf. Technical Expert Group, Climate change performance index, www.ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/190618.

93. See CCPI, the Climate Change Performance Index, which is an independent monitoring tool of countries' climate protection performance, www.climate-changeperformance-index.org, www.climate-change-performance-index.org.

94. Scepticsim has become a central concept in the new audit standards. It is pervasive in many audit standards: see ISA 200.

95. "Key Audit Matters" in International Auditing and Assurance Standard Setting Board, Standards for Auditing "ISA 701".

96. This is the formulation used in the Recovery and Resolution directive.

97. For third parties, the mention that the company's going concern status is no longer insured is a strong warning that their claims may be endangered, or at least that they should strictly follow up the situation. If no such mention is made, the risk may shift to the creditors. According to the audit standards ISA 570, the role of the auditor is to obtain sufficient, appropriate audit evidence about the management's use of the continuity assumption, or whether there is material uncertainty of the company's continuity. See UK Corporate governance code, 30.

98. See ISA 570. The inclusion of the "going concern" was refused by the International Auditing Standards Board, see for comment PIOB, Public report, 2015, p. 7.

A comparable warning about the company's financial weakness may in certain company law systems derive from the provision that once the net assets have fallen below 50% of the legal capital, a general meeting has to be called to decide whether to continue the company, or decide on its dissolution and proceed to liquidation. In practice, these losses will be formally established by the board, often on the auditor's proposal, the public being informed by their publication. The shareholders may also decide on refinancing, re-establishing the company's continuity.[99]

The role of the auditor may also be important in case accounting or other irregularities have been discovered, which will be reported to the audit committee. The international ethical standard on Noclar "Responding to non-compliance with laws and regulations"[100] requires the auditor who comes across violations of the applicable laws and regulations to inform the company especially its audit committee.

If the irregularities amount to serious violations of the accounting standards, or if fraud has been committed, the company may have to undertake further action to remedy the illegal situation. As to the auditor, his role does not extend to the systematic identification of fraud or violations of the law: his role is not that of a forensic investigator. Only if he comes across violations of the law, or a fraud case, or has been made aware about it[101], the international ethics standard requires him to report the violation to the internal bodies of the company, especially the audit committee. In the absence of a satisfactory response, the auditor has to notify the competent authorities.[102] It will up to the authorities to decide how the violation of the law will have to be dealt with, and this in accordance with the applicable national legal regime.

To a certain extent, the role of the auditor is somewhat comparable to that of the prudential authorities: he gives reasonable assurance that the financial statements as a whole are free from material misstatements. His assessment of the internal procedures convey the message that the information provided by the companies can be considered as reliable and that decisions by third parties – creditors especially – can rightly be based on the quality of the information so presented. But the auditor's opinion does not contain any assurance on the wider risk position or the correct functioning of the firm[103], nor of the risks flowing from the business environment in which it operates.

VI. RISK MONITORING – EXTERNAL OR INTERNAL

The risk monitoring in non-financial companies is mainly a company-internal activity: in this respect it is not very different from the monitoring activity in financial companies. The main difference is the presence of external monitoring by the authorities in charge of financial stability.

Some will defend the creation of an oversight structure similar to the macroprudential one developed for the financial world. It is however unclear whether this approach would be workable: the heterogeneity of the non-financial sector makes it much more difficult to extrapolate individual, mostly sectoral crisis cases to a more widespread systemic crisis. The diversity of these business sectors, and their activities in the non-financial world leads to greater risk diversity, calling for different remedies, therefore making the impact on the overall economy and the population concerned more difficult to predict. The lower degree of interconnectedness between activities and firms, limiting contagion but also implying differences as to the risk distribution, would make the introduction of sector-wide-measures – imbalanced and therefore less effective, and probably more controversial. Sectoral measures would be preferable and have been practiced, limiting the need for an overall regime. Rather than creating a sector-wide approach, based on a complex administrative or supervisory structure, solutions are more likely to be found at the level of individual firms, or of clusters of firms engaged in the same activity, calling for more focused risk management and the search for appropriate remedies.

This summary does not imply that economy-wide analysis would not be useful for the identification of preoccupying economic developments, an action which is already undertaken by the – international and national – economic and monetary bodies, with an overall view of the national and international economies, and formulating some specific recommendations.[104] The outcomes of their analysis is an indis-

99. Art. 7:228 Belgian Companies Law, WVV; if the losses have reduced the remaining capital to a much lower level (61500 euro in the Belgian law e.g.) any interested party and even the public prosecutor may apply for the dissolution of the company art 7.229 WVV.

100. Noclar Ethics standard nr 360. See for more details about the auditor's role, ISA 240 "The auditor's responsibilities relating to fraud in an audit of financial statement".

101. See the role of the whistleblower, see FSB Stocktake, nt. 9. EU Commission, Robust protection for whistleblowers across EU: Commission proposes new rules. 17.4. 2018, www.ec.europa.eu/newsroom/just/item-detail.cfm?item_id=620400; Proposal for a DIRECTIVE on the protection of persons reporting on breaches of Union law, COM/ 2018/218 final – 2018/0106 (COD). See SEC, Office of the whistleblower.

102. See *IESBA-Handbook-Code-of-Ethics-2018.pdf*. This regime applies to (a) Laws and regulations generally recognized to have a direct effect on the determination of material amounts and disclosures in the client's financial statements; (b) Laws and regulations which might be fundamental to the operating aspects of the client's business, to its ability to continue its business, or to avoid material penalties.

103. This would be expressed in the Going Concern statement.

104. See e.g. the studies on the prospective GDPs. See e.g. IMF, World Economic and Financial Surveys World Economic Outlook Database; www.imf.org/external/pubs/ft/weo/2019/02/weodata/index.aspx; OECD Economic Outlook, 2019-2.

pensable contribution to the risk evaluation by individual firms, worldwide or in individual jurisdictions, both banks and non-banks.

It seems more workable to define the scope of a future regime from the angle of the individual firms, analyzing major potential risks from their specific position. Specific risks flowing from production or distribution processes are best managed at the firm's level, or if the risks are common to several firms, by developing faster and more efficient preventive or corrective measures as far as risks at firms' level are concerned. By way of example, where harmful products or processes are concerned – medicine, foodstuff, engines, airplanes, or IT threats – these are best dealt with at the individual level, firms alerting each other and taking similar remedial measures. This is also the level where the most relevant expertise can be found. The board should systemically scan the potential risks in the business activity of the company, including commercial risks, internal risks, preparation for external risks, etc. The appointment of a well-prepared risk manager, assisted by a trained team, will be necessary. These obligations are rooted in the company law duty to maintain the business activity intact.

Even if the risks originate outside the firm – e.g. a major air pollution due to a fire – the firm will often be well placed to identify the risk and adopt the necessary measures to protect itself, its employees and the population living around it.

On the other hand, some major risks are not directly related to the firm, but affect the wider society, it would be up to the society's decision-making bodies – i.e. national governments, international bodies, financial authorities – to decree the necessary measures, individual firms contributing on a voluntary or obligatory basis. This regime would be applicable to collective risks, among which climate change, flooding, a highly transmissible virus or desertification will rank the highest.

The task of the authorities is then to identify the risks preferably in advance, and call for collective action, or to enact the necessary regulation, with appropriate sanctions if necessary. This dividing line between collective and individual risks needs to be further refined, and often there will be a direct relationship between the two sources of risk: combustion engine induced air pollution and climate risk are directly related.

As the assessment of these potentially destructive risks will firstly have to be undertaken at the level of the individual firms, company law – in its broader sense – could play a significant role in striving at risk reduction, thereby supporting the firms' continuity. This leads to the adoption of certain specific risk reduction measures, relating the firm's structure and its funding, its decision making, management duties and internal risk department. The designation of a well prepared risk manager will be necessary. An explicit reference in the company's purpose should be welcomed, defining the relating duties of the board.

As mentioned above, governance requirements will play a central role in structuring the risk assessment function within large companies. Board members should be sufficiently independent and knowledgeable to objectively assess the risks to which the company may be confronted.[105] Some should have specific attributions and experience in analyzing specific risks in the firms' activity or business sector, prerequisites upon their appointment. Their mandate should include the identification and assessment of possible macro risks due to company action, or inaction, potentially affecting beyond the company a wide range of its stakeholders.[106] Business risks should receive priority attention: the liquidity position of the company may call for special attention where exceptional support from the banking system may help solve eventual bottlenecks.[107] Climate or IT issues especially in relation to cyber security, are a high priority these days.[108] Directors should have the necessary expertise to oversee the executives in following up market, political or even regulatory developments. They should regularly report to the board about their analysis and its recent and foreseeable evolution and have the instruments ready to stop further IT abuses.

Boards should publicly report as to how they have fulfilled these oversight duties in their annual report[109], although specific details on risk related matters may negatively affect the business activity while too detailed disclosure might be counterproductive. In some systems, regular risk related press releases have been called for.

The legal basis for this action can be found in a generally applicable duty of care consisting of a widely applicable obligation for boards of large companies to take appropriate measures to deal with major risks relating to their economic activity. As these risks are increasingly identified and their impact estimated, liability should more readily be admitted in case of negligently omitting to adopt the appropriate measures. This widened duty of care should be part of the corporate governance principles and further elaborated in the internal code of conduct for directors, all this going back

105. S. 174 UK companies act: Duty to exercise reasonable care, skill and diligence, but no systemic dimension.
106. Company law does not include this dimension: see e.g. the impact of the activity in mining, or ecological effects.
107. Although there is no formal liquidity ratio for commercial companies, the boards are responsible for ensuring that accessible liquidity will suffice to cover the normal needs from the liquidity flows within the company (see: *Carillion* case, e.g on www.ft. com/content/277dfdce-b6ec-11e9-96bd-8e884d3ea203). FRC, Extension of investigations related to the financial statements of Carillion plc , FRC, 26 feb. 2019.
108. Among the causes of systemic concern may be: AML, nt.83; corruption (Corruption: see the G20 Osaka Leaders' declaration, www.fsb.org/wp-content/uploads/G20-Osaka-Leaders-Declaration.pdf) and whistleblowing as a remedy, nt. 83.
109. See UK Corporate Governance code, part 4, 26. The board should report on the principal risks and how these have been managed or mitigated, 28.

to well established common law principles of "responsible corporate governance".[110]

Recent versions of the corporate governance codes pay considerable attention to these wider responsibilities of companies, referring to the extended notion of the corporate purpose and further materialized in internal codes of conduct, expressing the concepts developed in the notions of corporate social responsibility and in the ESG principles.[111]

These more widely described duties of the board of directors of major companies should first and foremost be based on the company's significant economic position and the likelyhood that its activity may cause greater harm which can be qualified as "systemic". In these cases, boards should be held to stronger prudence to avoid this kind of harm to be inflicted.

A considerable part of the fundaments of prudential regulation is rooted in general company law: the provisions on governance, accounting, own fund requirement, auditing and the disclosure regime are part of to the basic framework, on which a significant layer of prudential regulations is superimposed, but leaving the principles untouched. The duties and liabilities of directors in both fields are not fundamentally different: they should behave with prudence and in a responsible way.[112]

The fundamental role of the legal system in dealing with systemic issues and finding macroprudential solutions is increasingly receiving attention. In economic writing, interesting perspectives are being developed as to whether changing legal provisions, especially in the field of taxation, or social benefits, may constitute a valuable instrument in combatting macroprudential risk, rebalancing our economies and ultimately in combatting the next recession.[113]

VII. CONCLUSION

The identification, structuring, monitoring and remedying of major risks in non-financial companies have several features in common with the comparable activities in financial institutions. Provisions on governance, accounting, auditing and disclosure are part of to the basic framework on which both systems rely. The duties and liabilities of directors and managers in both fields are not fundamentally different: they should behave with prudence and in a responsible way, pursuing profit for the shareholders and investors, but also avoiding the risk spill-over to their clients or to a wider community. In the non-financial world, these tasks are structured internally, as part of the general management of the company, and its assessment of its present and future position. In the world of financial institutions, the institutions are urged to follow the guidance of the prudential authorities, who having specific systemic risk in view, ultimately have the right to decide on remedial action. In the absence of similar guidance, the non-financial companies should develop their internal instruments to identify and prevent comparable large risks. In both cases however, it is company law that offers the basic framework within which companies will deal with risks, including systemic risks, strengthened by external oversight and regulation for the financial sector. An explicit reference in the company's purpose will help define the relating duties of the board.

This first attempt to broadening the perspective about considerable risks in non-financial companies should be further refined: defining the notion of systemic nature for non-financial companies, limiting the application to the largest or most risk intensive companies will raise definitional questions which have to be further discussed and analyzed. The techniques for monitoring companies actions in this field are among the subjects that will deserve further legal, but also political discussions. This will include the development of alternative solutions allowing to better allocate the consequences of the risks to the entities that created them, and provide for adequate remedies allowing a better protection of the impacted populations or victims. But these considerations do not prevent that our societies should further investigate how they can offer a better protection to their citizen against these increasingly destructive risks.

110. See for the principle: House of Lords, Anns v Merton London Borough Council [1978] AC 728; comp the German notion of the "the model image of the honorable businessman" ("Leitbild des Ehrbaren Kaufmanns").

111. See e.g. nt. 36.

112. In some cases, this double layered approach applying national and European law, as followed within the SSM applying national and EU rules, has sometimes led to conflicts between national company law and prudential requirements: examples are the "fit and proper test", or the two-tier structure of the board, with the chairman exercising operational activities, considered incompatible with the EU directive by the ECJ; "Credit Agricole a.o. case, Cases T-133/16 to T-136/16, 24 April 2018.

113. See especially Yair Listokin, Law and Macroeconomics, Analyses, as useful alternatives to interest rate policies, the effect of legal, essentially regulatory measures as instruments to combat shocks in the economy. Harvard U.P. 2019. See also: The Brookings Institution, Law and Macroeconomics, using regulations to combat recessions, 10 Sept. 2019, transcript es_20190910, www.brookings.edu/events/law-and-macroeconomics-using-regulations-to-combat-recessions/.