
Globalization and Innovation: An Intellectual Landscape

Theories of globalization emerged in the mid-1980s. They combine risk in three different ways: as a “godsend”, as a ubiquitous probability of a disaster or even as an injustice repeatedly affecting the most vulnerable. The diversification of the innovation system also took place in many ways. Literature on innovation systems includes a large share of comparatist processes: for example, opposition between the Japanese and American approaches to innovation. Globalization theories bring about a methodological break: the approach is global and no longer comparative between the different national innovation systems. Three theoretical families can be distinguished: the first will seek to concentrate the innovation system in companies, rather than industrial policies, i.e. more or less updated variants of Colbertism. A second family has no organizational dimension; what matters are the consumers and public policies. This family proposes political action. The third family is that of “change in change”, which means that globalization modifies the innovation system. In “supply” approaches of innovation systems, the risk is reduced in the form of a godsend. In “political action” approaches, the collateral damage of globalization is insisted on. In the “system” approach, a catastrophic risk is introduced. The three families also vary through the levels and scales of collective action: the first “offer” family seeks to reinforce small subregional collectives, regions like the German “Länder”, with between 5 and 20 million inhabitants. The second family is based on

political action on national and global scales, knowing that it forbids the organization dimension (territorial collectivities, businesses, universities, NGOs), the only one present in the “supply” approach. The “system” approach introduces new scales, particularly regional collectives like the European Union.

This chapter proceeds in three stages. The first section creates a map of the globalization theories. The second section contributes an overall view of the technological risk dimension in globalization based on viable resources in terms of databases on the industrial risks in the world by discussing technological disasters, then work accidents. The third section discusses the pertinence of the theoretical approaches, given the results obtained.

1.1. Globalization: theoretical approaches

The theoretical approaches of debates on globalization draw on ancient oppositions between Free Trade and Protectionism, and on a lamentation upon the decreasing quality of culture due to industrial massification. These stances date back to the industrial globalization of the 19th Century. For example, Marx defended Free Trade in an 1848 work [MAR 48], since nationalism only sowed harsh quarrels masking the only true conflict in his eyes, the one between the Bourgeoisie and the Proletariat. The concern over cultural quality is expressed by de Tocqueville in his work on the United States, which he characterizes through its democratic regime and cultural choices dictated by the search for a smaller common denominator, playing on the dropping quality [DET 61]. This intellectual landscape of globalization is greatly modified and can no longer be summarized in the large dichotomies of the 19th Century, namely Free Trade or Protectionism, Mass or Elite Culture.

1.1.1. The “Supply” approach: Kenichi Ohmae

We have divided the theoretical works on globalization into three families. The first of these families represents the works that assume a promotion of globalization. This family includes experts who are

concerned with the immobilism of behaviors in different classes of society in so-called rich nations, a loss of the taste for innovation that leads to little growth. The industrial policies generally supported by discourse on the decline of so-called rich nations are generally taken badly by these experts. The innovation system must be internalized in companies. A targeted policy is sometimes foreseen for the most deserving companies in this program, but this form of strategic commercial policy is not recognized in expanded protectionist policies like those recently set forth by the American administration.

Since 1985, it is the books of Kenichi Ohmae that have popularized the globalization strategy for companies. His works have a precedence in this concern, and he is thus one of the primary strategists aligned with the maxim “Think globally, act locally”, accredited to Akio Morita, then president of Sony. Kenichi Ohmae, born in 1943 in southern Japan, was trained as an engineer for the nuclear industry and then turned toward reflection on business strategy. Risk is not a measure for Kenichi Ohmae, who raises up against safety studies conducted based on probability models. He favors practical intelligence based on maxims in a tradition of strategic thought.

Kenichi Ohmae’s work *Triad Power* [OHM 85] is situated within the framework of the strategic and organizational reflection of companies. It is thus recommended that companies favor involvement in the three principle economic regions of the world: the United States, the European Union and Asia-Pacific. A simplification of international organization is also desired through the limitation of hierarchical levels of public authorities in global regions and microregions. These regions must welcome companies by being attractive. Risk is positive for Ohmae; it is first of all an opportunity: for companies, it is a matter of getting involved in the large economic flows, the public authorities coming to support them. This work is the first manifestation of a globalization theory, original vis-à-vis schisms between Protectionism and Free Trade or between American and national culture.

The work of Ohmae [OHM 96] clarifies the role of public authorities. “Competitiveness is not and cannot simply be the property of one Nation-State” [OHM 96, p. 68]. It proposes dividing Japan into

11 regions and generalizing a situation comparable to that of Singapore on the planetary level, a State-Microregion that has just a bit more power than a territorial collective, particularly in commercial matters. These “Länder” with extended commercial competences would ideally have between 5 and 20 million inhabitants, and contrary to the megacities, they could freely have property in peripheral areas. The agenda of these public agencies is that of improving the resilience of companies by unveiling policies that “help companies learn and react quickly to the evolution of the situation rather than policies that protect them or isolate them from competition or external change” [OHM 96, pp. 96–97]. The “Colbertist” policies like that of Japan’s Ministry of Industry have a substitution effect, “no policy can replace the individual efforts of the company management aiming to create links between their activities and planetary economy” [OHM 96, p. 68].

Ohmae proceeds to spatial hierarchizations: global implementation of a company takes place by privileging certain areas. The governance of a company between areas must be equidistant. There must not be compensation for defavored areas. The spatial hierarchy is also put in place between regions that are well integrated into the global flows, and peripheries that must be annexed without benefitting from compensatory transfers. It is the rural areas that are relegated to the bottom of a spatial social scale. Ohmae is opposed to the principle of universal service, the obligations of spatial equity demanded by the regulation authorities (for example, to cover a territory with mobile telephony). “Multinationals have no need to establish a series of identical UN-style national organizations” [OHM 96]. The organizational principles mentioned by Ohmae are rather integrational; that is to say, they are not, as a general rule, those of simple financial holdings. The principle of justice explained is that of objective internal equity in the multinational firm. The manager is “equidistant”; he need not favor this or that part of his organization chart, the verticality of which is presented as reduced.

For Ohmae, the established relationship between globalization and innovation is only considered in the method of enlargement. The strategic manager is a realist from an international relations

standpoint; the company profits from differences brought about by the powers in place. It can be satisfied with global coverage by a network for 30 to 40 City-States that do not need to subsidize peripheral rural areas, but nevertheless have land necessary for their expansion.

1.1.2. The “Political Action” approach: Zygmunt Bauman

The second family of theoretical approaches brings together those who despise globalization. Political activism is a common trait of this family, antiliberal in the sense that it does not moderate public interventionism. The recommended arrangements can take the form of tax policy, sectorial industrial policy, or a reinforcement of moral duties. Common elements in this family of rhetorics are also lamentation upon damages from globalization, a disappearance of solidarity and a marked suspicion of the elite and the media.

Zygmunt Bauman (1925–2017) was one of the figureheads of this family, particularly through two works dedicated to the “collateral damage” of globalization [BAU 99, BAU 11], as was Naomi Klein, who developed a similar theme of criticizing globalization (see Box 1.1).

Zygmunt Bauman was a Polish sociologist, first a military intelligence functionary during the Stalinist period. He was thrown out of the Polish Communist Party in 1968, then taught in Tel Aviv and Leeds. He developed the subject of the “liquid society”, a society in constant motion, but with no “destination, final limit, or anticipation of an accomplished goal” [BAU 17, p. 106]. Bauman presents globalization as a victory of the merchant evaluation, capable of questioning humanity in its relationship with culture as it has been able to exist since Lascaux, Chauvet, or Altamira. Bauman believes that the value of novelty today has supplanted that of durability [BAU 17, p. 100]. The critique of consumer and spectacle society is that of the futile, of an “obsessive acquisition of manufactured products, and of its growth, which leads to the reification or objectification of the individual” [DEB 67, p. 23].

Naomi Klein is a Canadian journalist who lives in Toronto. She is a figurehead of the North American “left of the left”. Several of her works have been bestsellers, particularly her work *No Logo*, which was released in December 1999 and sold more than one million copies in 28 languages [KLE 01]. Her other important works are *The Shock Doctrine*, released in 2007 [KLE 08], and *This Changes Everything*, released in September 2014 [KLE 15]. The work *No Logo* is contemporary of the Seattle protests concerning the World Trade Organization. *The Shock Doctrine* follows Naomi Klein’s reports on the situation in Iraq, while *This Changes Everything* deals with the stop to negotiations on climate change brought up in Copenhagen in 2009. From protests in Seattle to the climate march in September 2014, her works thus trace the development of global movements.

No Logo

Naomi Klein underlined the hazardous character of the term “antiglobalization”. The work *No Logo* is more that of critical “consumerism”. Large companies are already global, and before this state of affairs, an alternative course of action and disobedience strategies were possible. This is the subject of a significant portion of *No Logo*. In light of this globalization created by companies, it is a matter of developing a political space, a global public opinion. This has great opposing power due to the reputations that these companies seek to develop for their brands.

The shock strategy

This second work places liberal economist Milton Friedman in the limelight. He was responsible for the opportunistic use of natural disasters and sometimes of the voluntary creation of chaos for the implementation of institutional reform leading to a reduction in public services. A shock strategy is one that prepares these plans with drastic public budget cuts and their implementation after real or slightly planned disasters. The work records an upheaval in public policies on a planetary scale. Before the Chernobyl catastrophe, denial policies were widely used by different political regimes. Since then, political expressions have turned more to apocalyptic discourse.

This Changes Everything: Capitalism versus the Climate

This work proposes an environmental justice strategy based on the recognition of ecological debts between nations. The work *This Changes Everything: Capitalism versus the Climate* is very critical of large environmental organizations, the “Big Greens”, and leftist government policies, like the Obama administration, which are seen as too complacent vis-à-vis large companies. The propositions made are those of very constrained regulation to be imposed upon companies. To do this, it is necessary to create a positive, popular shock to implement the means of achieving goals in the fight against climate change. Her latest work, *No is Not Enough* [KLE 17], is a call for political action after the election of Donald Trump.

Box 1.1. Naomi Klein

A denunciation of frivolous contemporary art is made in the same terms, and under the same title as a work by Guy Debord, by Peruvian author Mario Vargas Llosa: “the superficial and flashy culture, that of games and poses, is incapable of begging for certitudes, myths, and rituals of the religions that have survived the crucible of time” [VAR 15, p. 43]. The public attraction for topical catastrophes is a “morbid nourishment demanded by an appetite for surprise” [VAR 15]. For Bauman, there is a fundamental opposition between rationality and moral judgment. The genocide in concentration camps during World War II is a “product of rationality” [BAU 02]. It is part of a historic continuity of labor rationalizations and is explained by the emancipation of the State from all forms of social control over its powers [BAU 02].

The Bhopal (India) industrial catastrophe on December 3, 1984, the accidental emission of a cloud of products from a pesticide factory, led to questions concerning the possible “double standard” of manufacturers, who allegedly had their most harmful units moved to nations with fewer regulations [CAS 85]. India is not part of Kenichi Ohmae’s Triad, which features in the literature of good organization, seeking a high standard in the presence of an alternative in the quality of regulation and risk management. This “double standard” perspective was developed by Zygmunt Bauman (e.g. [BAU 11]). The waste of globalization was concentrated in peripheral areas and populations. Risk was endemic for some underprivileged groups, social outcasts who gathered disasters. Globalization increases the critique of “collateral damage” on vulnerable populations and of a general threat to cultures and institutions offering a stable living environment. For Bauman, innovation moves too quickly, and runs out, by eroding the long-term structures. Globalization, “far from leading to the homogenization of lifestyles, ends up setting them against one another” [BAU 99, p. 32] between an “elite in motion, master of mobility” on the one hand and “locals”, eternal “vagabonds” on the other [BAU 99, p. 142].

1.1.3. The “system” approach: Ulrich Beck

A third approach was developed by the political risk sociologist Ulrich Beck (1944–2015). Risk is thus on the darkest side of a probability of catastrophe, and this vulnerability is shared by everyone. Risk is ubiquitous. It will not specifically hound the most destitute or the most marginalized minority, as in the “double standard” literature. This also supposes a disappearance of the political, whereas for Beck, it is a matter of displacement, an ongoing transformation of governance and the involuntary effect of the multiplication of catastrophes. Beck distinguishes two large forms of modernization: the first, that of the Industrial Revolution, is associated with majority political mechanisms that can be disadvantageous for minorities; the second is said to be reflexive and brings about a renewal of political mechanisms. The catastrophe has a creator effect for these new political forms. Beck incarnated the European option in light of the United States’ unilateral policy after the attacks on September 11, 2001, or political options determined exclusively by domestic considerations, such as the ones for which he reproached Angela Merkel. He was in favor of extending the Erasmus system to all young Europeans as well as social inclusion not limited to waged employment, but from citizenship alone.

The theory of *Risk Society* was exposed by Ulrich Beck in his 1986 work, published at the time of the Chernobyl catastrophe [BEC 01]. The risk, for Beck, is an anticipation of a catastrophe. “Risk has become the measure of our action”, it is a transformation of modernity. Just like Comte, Beck proposes secularization of societies in two stages. For Comte, there was an intermediate “metaphysical” stage before the positivist era. For Beck, this intermediate stage is that of the transition through an industrial society. This is only a “semidemocracy” with ideals of progress that “contravene the fundamental rules of this same democracy”. In “The Global Risk Society”, “the directions taken by the evolutions and the results of technical mutation become objects of debate, and they are ordered to be legitimized” [BEC 01, p. 405]. More frequent technological shocks make “the modeling potential of society leave the political system to take a place alongside the subpolitical system of scientific-technical-

economic modernization”. An example of this “subpolitical” can be given by the fight against atmospheric pollution in large metropolises: the extension of the highway system depends on technical service, while the political consensus concerning the fight against atmospheric pollution is real. Urbanism like that seen in Los Angeles with its multiple highways results purely from the “sub-political system of scientific-technical-economic modernization”. For Fukuyama, a return of the political would be necessary to bring an end to this disorder arising from science. However, elected officials, even in Los Angeles, have not remained inactive; they have simply only been able to react in a limited way, e.g. through regulations favoring zero-emission vehicles. Beck advances a largely undetermined political transformation process, but going through the channel of an extraparlimentary policy. Political decisions are made through multiple channels, e.g. through companies or non-parliamentary groups that bypass all procedures under parliamentary control. The central forums of the subpolitical are the media and courts, not the parliamentary assemblies. The “subpolitical” refers directly to fundamental rights, and thus plays a role in limiting the political powers instituted through electoral means. For example, says Beck, medicine is “subpolitical” and unites “research, training, and practice, independent of all outside consent”. There is no separation of powers or more generally a search for a balance of powers. One characteristic of the “subpolitical” is thus its incomplete constitutionalism. In particular, the recognition of fundamental rights is not necessarily accompanied by a good balance of powers in the familial, organizational and scientific spheres. In *Risk Society*, Beck insists on restricting the place of parliamentary democracy procedures through underlying networks that are the true political operators in the sense that they implement significant transformations that affect the life of every individual. The terminology of “subpolitical” can also cover dangerous situations, like technocratic decision circuits or criminal organization decision circuits. In *Risk Society*, the rise of the subpolitical can create new political risks. In institutionalist trends, these are political risks brought about by parliamentary activity and considered with privilege. Arrangements with a parliamentary source favoring subprime contracts provide an example of these parliamentary political risks. For Hayek, it is important to favor

judges' rights to avoid this kind of derivation arising from parliament. For Beck, political risks can also have an extra-parliamentary source, which is undeniable.

Beck's first proposal is that modernity has the ability to transform. Contrary to Weber and Fukuyama, industrial society does not constitute a final state of modernization. Societal secularization continues, a process of civilization is in progress through globalization. Early 20th Century sociology insisted on the inexorable rationalization of society: it is absolutely not Beck's theory that insists on the transitory character of a more and more taylorized and controlled society as described by Weber, that of the first modernization and industrialization as seen in Germany at that time. Today, the global risk society is emerging as endogenous evils that have resisted all control are put in the public sphere.

Beck proposes a game of counter-powers and opposing powers. It is a matter of establishing "legal guarantees of certain possibilities for influencing the subpolitical". Courts, second opinions, media: the combinations of powers must allow a reflexive democracy to be elaborated, particularly for technological and natural risks. An opposing power is necessary for technical expertise. For research, prior risk management must be urged, with disciplinary compartmentalization combatted.

With institutionalism highlighting risks from parliamentary procedure, it would be paradoxical in this analytical framework to magnify parliament's role. However, playing on the expansion of the subpolitical likely presents even greater risks than those arising from parliamentary indiscipline. Beck proposes a process more than normative institutional solutions. Humanity forms a cosmopolitan community that shares the same global risks; however, the trajectories of "cosmopolitanization" are different and must take into consideration the national attachments, mediators between the individual and the global.

The question of climate change provides a great illustration of the difficulties defining this new risk policy that Beck started mentioning

in 1986. However, Beck's theoretical predictions have shown themselves to be pertinent: there was indeed an extension of insecurity for all individuals, which is one of the characteristics of a global risk society. The responses provided in the formulation of the first modernization, like that of the United States after September 11, have shown themselves to be ill-adapted. The task remains to better define the forms of political society with parliamentary and extra-parliamentary components that suit a global risk society, which Beck recently employed for the question of climate change, for example.

Beck indicates that the world is transforming through the appearance of a "conscience of multiple belongings" [BEC 06, p. 142]. "Cosmopolitanism" is the wise term given to political reflection including all of humanity. With Kant, German thinking introduced cosmopolitanism with teleological reasoning: since the final state of humanity is peace, all pedagogues must start teaching this peace today. In the 19th Century, cosmopolitanism could thus appear to be an ideal horizon, whereas today, what is real is an alterity that is always nearby. Daily life is now that of "obvious cosmopolitanism", "even though it comes into ever-greater opposition with the categories for understanding reality, which obey national norms" [BEC 06, p. 146]. Even the forms of resisting globalization are expressed in "political globalization" and therefore participate in the same dynamic.

Beck defines the present period as a new process of civilization that operates on the individual level and the level of each state. Norbert Elias had introduced this notion of a process of civilization which creates a progressive decrease in social violence and studied it through the comparison of the small European states during the Renaissance. Beck distinguishes globalization as a process of civilization from the political discourse of multiculturalism. Beck underlines weak points in the theory of multiculturalism. This theory is not perceived in the dynamics of civilization and is limited to groups within a single nation. Beck sees globalization in a broader sense, as the end of closed societies and affiliations exclusively for individuals. Cosmopolitanism aims "to be internalized on the state level" [BEC 06, p. 344]. All nations must cooperate to care for individuals, all through multiple

affiliations. Beck likely proposed the most thorough theory concerning the globalization experienced in the contemporary era.

Beck develops a vision of the “emancipatory catastrophe”, producing a social norm and public well-being [BEC 15]. During the beginnings of sociology in the 19th Century, Comte presumed that all human conglomerations provide sociability. As for the political socialism that appeared during the same era, a social revolution must soon come to contribute regulations of an era of peace and justice. Today, an environmental crisis is going to be created, for example, from an episode of urban smog: like for Comte, this means that the conglomeration provides something positive, the fact that the urban concentration allows environmental awareness to be created. Revolutionary socialism, on the other hand, places the positive catastrophe within a voluntary advent. However, according to Beck, the creation of new regulations actually comes from the initial “emancipatory catastrophe”. For example, climatic risk has created cosmopolitan communities of actors [BEC 13]. Beck’s proposal is methodological: to form policies appropriate for global problems like climate change, a “methodological cosmopolitanism” is opposed to sociologists’ “methodological nationalism”. The nationalism of communities was established during the era of European migration to the New World through a creole imaginary, where colonial residents found themselves placed between a decisive metropolis and new arrivals or new competitors. The “methodological nationalism” of most sociologists can only introduce overly partial views on a question like climate change. Sociological methods must therefore be adapted to the present situation, which once again adopts “methodological cosmopolitanism”.

In Beck’s sociology, globalization (or “cosmopolitan realism”) is a fact: everyone has multiple affiliations, and there is no Far East, but each has a Japanese or Lebanese restaurant next door. Likewise, climatic risk gives a global impact to small daily gestures. According to Beck, the cultures of sustainability oscillate between utopia (a tradition in line with Hegel’s idealist philosophy) and the apocalypse (generally invoked to declare a state of emergency,

regulation with an iron fist). In practice, apocalyptic believers (e.g. terrorist groups) play on the intensification of local conflicts and push for a policy of tension and legislation of exception. The territories today with the ability to reproduce global conflicts on a small scale are brought about by these large-scale policies.

A positivist culture of climate change, that of Beck's *emancipatory catastrophe*, presents the following characteristics:

- it demands limited knowledge;
- it places itself in an intermediary time between utopic, generally technician, cultures, which are atemporal or in very long time periods, and cultures of political urgency, with very short periods where there is no longer a day after tomorrow. This intermediate temporality is a short intergenerational time (that of our children and our grandchildren).

Nietzsche had foreseen the arrival of a time of Great Politics. Climate change or the Jihadist threat lead to even local politicians being determined by global issues, fulfilling Nietzsche's prediction. Beck was sensitive to the difference in politicians between the Small Politics that they largely practice and the everyday world that has become one of Great Politics.

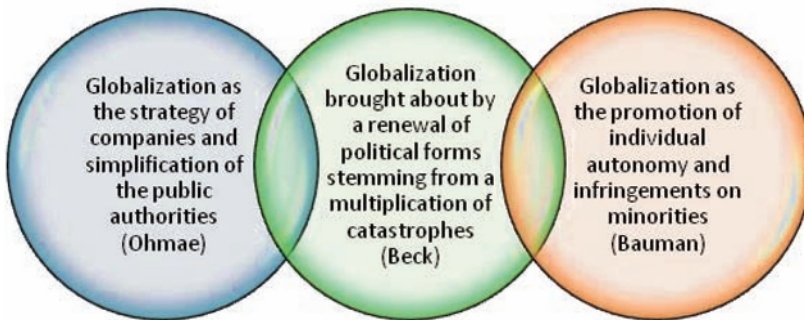


Figure 1.1. Globalization theories

	Ohmae	Beck	Bauman
Definition of risk	"Godsend"	Ubiquitous	Social amplification
Role of companies	Active, preponderant	Concern due to a lack of control	No organizational dimension
Political sphere	Political market of regional attractiveness	Realism of existing global politics	Hope for a "return of the political"
Formation of a Welfare State	Welfare at the level of groups of companies or regions	Transformation	Description of a "fluid" society, anomic with no customs

Table 1.1. *Comparison of the globalization theories*

1.1.4. Theoretical approaches before 1986

These globalization theories only consider it to be a recent phenomenon, defining a time period after Chernobyl, unlike historic research using the term "globalization" for a large number of periods starting with the exodus from Africa for the contemporary human species, making them a ubiquitous species for approximately the past 45,000 years. Even the context of the Bhopal catastrophe is more related to the state of India described by Gunnar Myrdal in his 1968 work *Asian Drama* [MYR 68]. Indian politics is described therein as bringing together the dilemma leading to a weak growth in employment and establishment of capital industries not competing with traditional artisanal industries. Neither these industrial establishments nor the traditional industries have great strength in creating jobs, whereas the natural growth of the population is elevated. Economists recommend a development policy through innovative SMEs. In Asia, "industrial employment cannot be greatly hoped for in the decades to come" ([MYR 68], p. 251): this projection of the 1974 Nobel Prize for Economics laureate, though it makes us smile today, indicates how unexpected the emergence of the Asian workshop was, even for the best theorists working with the innovative and developmental economy. An awareness of the theoretical insufficiencies is present in Beck's first work [BEC 01], which sets out a first modernization well adapted to Myrdal's developmental

economy against a second one in progress. Globalization theories are thus no older than 30 years old. The phenomenon of globalization may have a different chronology.

Myrdal's study of India bears witness to his disappointment faced with the progression of the Welfare State for which he had been one of the primary theorists since the 1930s [MYR 64]. He had observed the spread of social democracy in Western Europe: the electoral battles there no longer concerned only practical positions of implementing social rights. In 1960, he had predicted the globalization of "prophylactic politics" by replacing "liberal philanthropism". Myrdal's social engineering was that of universal systems, in opposition with politics targeting a part of the population, the poor or those suffering from a given illness. The Swedish Welfare State was built in a context of low productivity and high emigration rates to the United States. A more equal salary division allowed living standards to be improved. For 1960s India, this would take time, and "liberal philanthropism" remained the norm. The emergence of the Asian workshop raises the primary obstacle observed by the promoter of the Welfare State.

The 1974 Nobel Prize in Economics, shared by Hayek and Myrdal, provides an abridged version of the previous globalization theories: on the one hand, critical liberalism of all forms of planning for Hayek, and social engineering of Development with Myrdal, on the other. The three theories of globalization that appear in the mid-1980s differ in their definition of risk, their place for the company and organization, that of the political debate, and in their projection for the future of the Welfare State (see Figure 1.2 and Table 1.1).

1.2. Industrial risks in the world: catastrophes

The empirical study of global data of the period 1983–2014 indicates some positive evolutions in the recent period, which is an argument in favor of the ubiquitous approach proposed by Ulrich Beck (1944–2015).

Industrial risk is defined as the probability of an accident at a site or in an industrial process. Major risk is characterized as that which seriously affects the site and its surroundings in terms of the number of victims, people affected and environmental harm. Work accidents affect one or more workers working on an activity. The recent catastrophes of Rana Plaza in 2013 and Tianjin Port in 2015 are unequal in scale and they raise questions on the relationships between globalization and industrial risks. The explosion of Tianjin Port took place after a fire in a chemical products warehouse. Among the 173 victims were the firefighters who paid the highest price (99) due to the lack of information on the chemical compositions of the stored materials. In Bangladesh, a building housing business and five garment factories, Rana Plaza, collapsed, causing the deaths of 1,138 people, most of them workers. In these two catastrophes, the companies were close to the local and globalized authorities because of the spread of goods produced there. The stories of these events were placed in interpretations of globalization: the better established the facts seem, the more the globalization theories seemed to go in different directions: for some, a return to public regulation and close connections between companies and States [BRE 10]; for others, however, a generalized disappearance of the Welfare State [BAU 11].

The available data on industrial risks in the world remain incomplete. They were collected partially in a regulated sector, leaving formal and informal industrial activities in the shadows. A global estimation task of the large tendencies of globalization through industrial accidents was performed in collaboration with the International Labor Organization in 2003 [HAM 09a, HAM 09b]. These estimations were completed and extended to 2014. This contributes to the evaluations of the empirical pertinence of the different globalization theories.

The data on catastrophes in the world come from usage for international rescue operations and feedback. The first catastrophes recorded were earthquakes starting in the early 20th Century, and then epidemiology spread to all disasters. An initial discussion deals with the timeframe to be foreseen in the study of globalization. The data on industrial risks leads us to accept a timeframe that fully places the

period of contemporary globalization in the mid-1980s (Figure 1.2). The “mass” of technological disasters demonstrates a very unequal division, with a low number of events before 1985 and an increase thereafter.

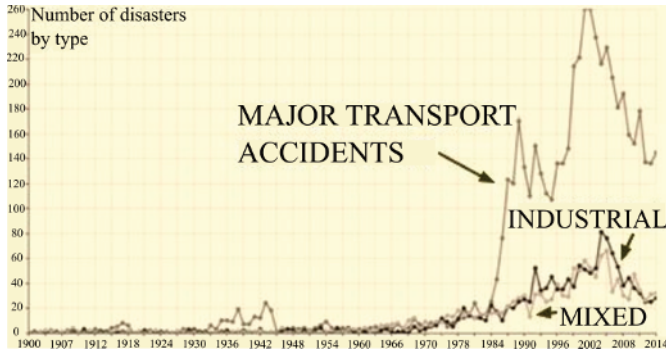


Figure 1.2. Annual numbers of technological disasters around the world (1900–2014) (source: EM-DAT¹)

Industrial catastrophes were the most numerous in 2004 (81). Large accidents in the logistics chain have increased since 1985. The most common accidents are major highway accidents, followed by shipwrecks.

Two turning points must be commented on in these statistics on technological disasters: the stark growth in the mid-1980s and the improvement seen in approximately the last 10 years. These disasters have not increased in only one part of the world, Oceania. They were seen more numerous in Europe and in the Americas. They have greatly increased in Africa and Asia. The poor quality of road infrastructures, with an upheaval of traffic on the road due to the low cost of fuel, is a conclusion that can be drawn in the analysis of the growth of technological disasters in the mid-1980s. A comparison of Oceania and the Americas for coal mines shows the pertinence of risk management vis-à-vis simple conformity to regulation [POP 08].

¹ D. Guha-Sapir, R. Below, Ph. Hoyois – EM-DAT: The CRED/OFDA International Disaster Database; www.emdat.be – Université Catholique de Louvain, Brussels, Belgium.

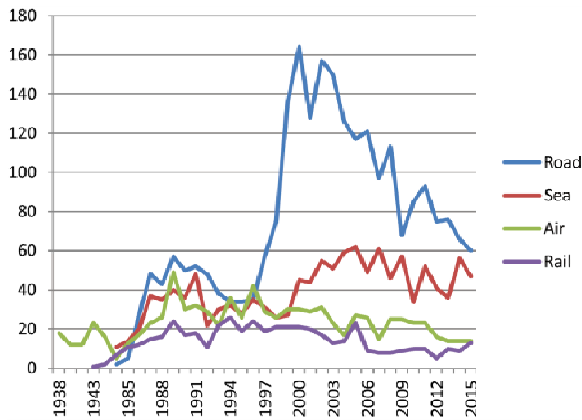


Figure 1.3. Annual number of disasters concerning transport around the world (source: EM-DAT)

An improvement in terms of major risks comes from a new technology, if this corresponds to an appropriate organizational change [DIO 99]. For some kinds of industrial disaster, organizational learning can be brought about. Chemical accidents would be a good example of this. Specific legislation was put in place in Europe in 1982 with the Seveso directive. This risk has not shifted to other regions of the world, however. Fires and collapsing industrial buildings have leveled off – the fire at a Bangladeshi factory in 2012 and the collapse of the Rana Plaza in Dacca the following year are highly representative of these major accidents during the period of globalization.

The technologies involved in technological disasters since their rise in the 1980s are outdated. Explosions, fires, and collapses are not consequences of technologies from the period of contemporary globalization, just like for major transport accidents. This conclusion can be extended to work accidents around the world.

1.3. Work accidents around the world

If the organizational factors associated with new technologies are highlighted in the literature [DIO 99] to explain a reduction in

industrial disasters and work accidents, a cross-checked selection between the level of globalization connected to new technologies and the incidence of work accidents indicates an inverse association between these two terms (see Figure 1.4).

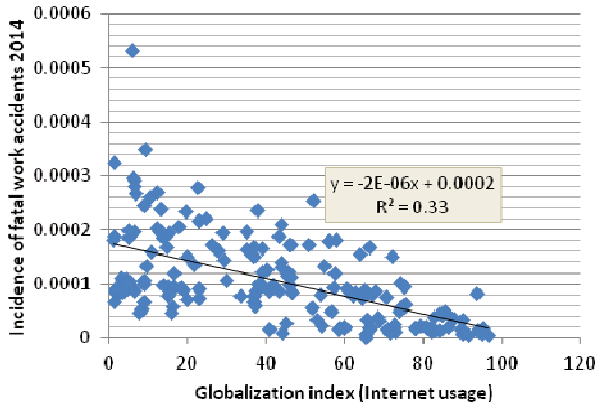


Figure 1.4. *Incidence of fatal work accidents and globalization (source: World Bank and International Labor Organization)*

An indicator of globalization independent of the adoption of a new technology allows an association of the type “more globalization, fewer accidents” to remain (see Figure 1.5). Internet usage has only reinforced a preexisting situation.

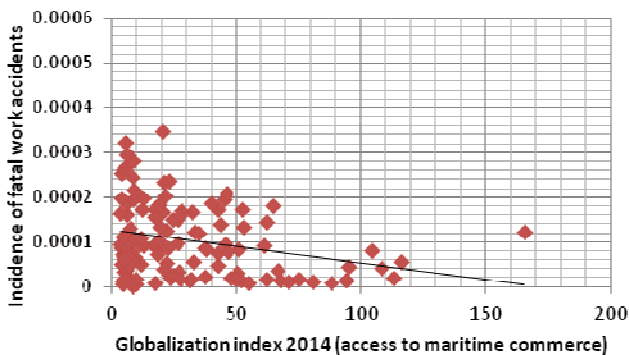


Figure 1.5. *Maritime access and incidence of accidents (source: World Bank and International Labor Organization)*

Professional risks remain structured according to industries and professions. The statistical system of the International Labor Organization provides access to data concerning professions. The data by industry are difficult to exploit due to their greatly incomplete character and differences in the definition of each industry by different nations. The most dangerous professions remain forestry, fishing, mines and quarries, and high-up work like work on buildings.

Globalization affects the remuneration system in various ways. On the most global specialized level, where we are now, no simple relationship has been found between remuneration policies and professional and industrial risks. The most commonly advanced hypotheses are those of a “risk premium” and the opposing hypothesis of a double relation in the face of exposure to professional risk – some will have a “penalty”, whereas others will have a premium due to their overexposure to risk. In the United Kingdom, during the last Ebola epidemic, a polemic arose concerning the remuneration policy of operational personnel, regarded as not being generous enough with regard to social utility and the risks incurred. The heads of healthcare systems in the concerned nations and large medical NGOs reached a compromise, particularly taking the quality of the personnel’s training, the preservation of intrinsic motivation and the long-term integration of the remuneration policy for an African healthcare system into consideration. Worldwide organizations create remuneration policies by performing an acculturation between different systems. This remuneration policy is a form of incitation, less simple than the “risk premium”, monetary compensation for the risk run. Competing formulations, like the “efficiency salary” or that of discriminatory double-relation arrangements facing exposure to risk also are not suitable for the case examined.

The growth particular to each sector, or, on the contrary, to its decline, affects remuneration. The average deviation for miners, for example, between team leader and assistant dropped in the 1990s, then increased in the early years of the new millennium. On average, the D1/D9 (relationship between salaries from the first decile and the ninth decile) was established during the period of globalization, according to data from a sample of 60 nations collected by the World

Labor Organization. If this $D1/D9$ ratio is correlated with the incidence of work accidents, however, the variations of this ratio over time (generally low) are no longer apparent. Sweden, which has the lowest incidence of work accidents, also has the lowest $D1/D9$, equal to 2 over the long term. Export companies can contribute an “export premium” and, on the contrary, contribute to an increase in inequality. All of these explanations on the transformations of remuneration in globalization do not call on exposure to professional risks.

The variations in global average salaries by profession can be illustrated through three professions: the firefighter, which is emblematic of a voluntary exposure to risk; the lumberjack, who has the highest objective professional risk; and the bookshop employee, on the other hand, with the lowest risk. The average global remuneration for a firefighter is very close to the average for all professions. The average global remuneration for the bookshop employee is most often greater than that of a lumberjack; nevertheless, the difference is slight and sometimes inverse. The risk exposure scale (here, Lumberjack, Firefighter, Bookshop Owner; see Figure 1.6) never translates to the remuneration hierarchy, though. Globalization has only been involved in recent years in introducing new commercial practices, which puts the relative classification of the bookshop employee’s remuneration at a disadvantage. There is a social valorization for certain risky professions that serve others; however, the monetary compensation for the risk involved is surprising, giving its modesty during the last epidemic of hemorrhagic fevers such as Ebola.

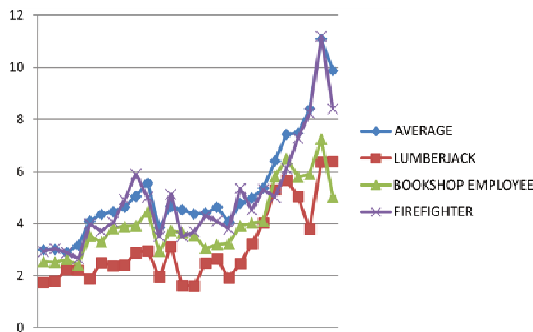


Figure 1.6. *The firefighter, the bookshop employee, and the lumberjack (real hourly salary, 1983–2008) (source: International Labor Organization)*

The global workforce grew by 20% between 2001 and 2014, increasing from 2.8 to 3.4 billion people aged 15 and older. The estimate made using 2014 data on work accidents is below the calculated value based on the growth of the employed population alone. A decrease in the incidence of work accidents measured in relation to the active population is therefore imagined through this estimate. Twenty percent of the cases from 33 nations (out of 199) work accident statistics are considered to be reliable, which is a progression from previous estimates. Improvement factors were therefore at work between 2001 and 2014, but with significant disparities between sectors and groups of nations (see Figure 1.7).

Organizational factors are allegedly the most important for serious work accidents. The conjectural dimension is more present through a larger quantity of minor accidents in the period of rapid activity growth. The most serious technological catastrophe from the period is linked to a natural contingency, the 2011 tsunami in Japan. The record is favorable for Europe, according to different indicators, work accidents and technological disasters. The Seveso legislation in Europe was put in place in 1982, with an obligation to declare incidents. Here, too, though these statistics are specific to classified establishments, the drop is noticeable for the recent period.

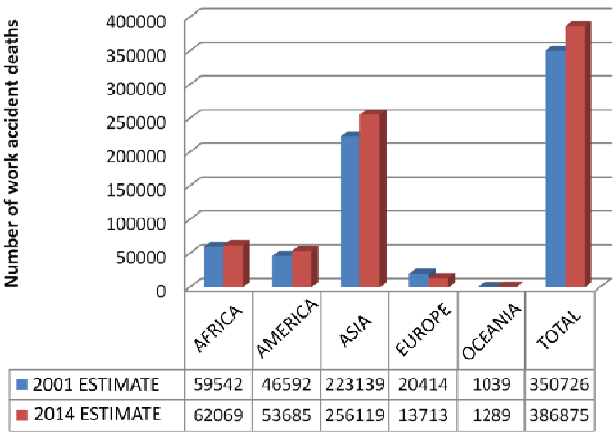


Figure 1.7. 2001 and 2014 estimates of the number of fatal work accidents around the world (sources: International Labor Organization; Hämäläinen (2009) for the 2001 estimate; the author for the 2014 estimate)

The reasoning with the incident rates indicates that this is a global organizational improvement, but which leaves a gap (of a factor of approximately 3.5) between the nations with high-quality industrial relations and the rest of the world. Macroeconomists Hall and Soskice [HAL 02] popularized a typology based on the “coordinated market economy” (CME) countries and “liberal market economy” (LME) countries. These CME countries are primarily those of Northern Europe. The existence of regulation, including through the right to union expression, is not the point that separates these two groups of nations. An index created using databases on the conventions signed by the nations of the International Labor Organization does not give very different average values for the two groups of nations. The situation is only contrasted for indicators based on behaviors of observing good practices, like transparency or respect for safety rules (see Table 1.2).

	No. of countries	Transparency	ILO index of union rights	2001 Estimated incidence	2014 Estimated incidence
CME	12	74.6	95	4.5	3.25
LME	161	41.4	90.7	15.1	11.3

Table 1.2. “Coordinated Market Economy” versus “Liberal Market Economy” and fatal work accidents (sources: International Labor Organization; Hämäläinen (2009) for the 2001 estimate; the author for the 2014 estimate)

The typology of industrial relations can be detailed in order to accurately characterize the two very large nations: China and India. Three subcategories can be created for the LME type (see Table 1.3). More precisely:

- *Corporatism*: There was no promotion of civic and social rights. In the historic definition of preserved corporatism, professional organizations were transformed into national bureaucracy. This is thus more or less brutal confiscation by a centralized power. Corporatism forms an administrative labor law, often with a single organization for employees and employers (e.g. China and Egypt). Peronism in

Argentina is another example of corporatism that can be used as a point of reference.

– *Circumscription trade union (CTU)*: There was no questioning of certain aspects of corporatism like control over employment due to the historic anteriority of the establishment of civic rights (India). Financing political parties takes place through union organizations. The *closed shop* or *union shop* system of recruitment monopoly through a union organization is common. The closed shop is forbidden today in the European Union and has been since 1990.

– *Independent*: There was a gap period between the establishment of civic rights (generally the 18th Century) and that of social rights (last third of the 19th Century). However, there was an absence of corporatist tradition (United States, Australia), or the abolition of corporations' rights (France). There is union pluralism, but also an independence of the political vis-à-vis the work that provides policies that can be more partisan or more "ideological" (France, United States, Australia, Canada).

LME			CME
Corporatist (China)	Circumscription trade union (India)	Independent	Opinion trade union
Before the installation of civic rights: absence of real union freedom	Long-standing existence of civic rights	Differing dates for the creation of civil and social rights	Historic simultaneity of the creation of civic and social rights
Often a single organization for bosses and workers	Charisma of the local politician	Sectorial federalism	Pluralism of union organizations
Organized on a professional basis	On a local basis	On a sectorial basis	On a sectorial and opinion basis
Representative of a nationalized central power	Parliamentary representative through a party	Submissive to lobbyist regulation	Joint committee governance

Table 1.3. *Typology of the industrial relationships around the world*

This typology allows us to characterize the period 2001–2014, a situation of industrial relationships (LME-CTU) associated with the most negative variation in the period (Table 1.4).

Type of industrial relationships (outside microstates)	2001 Estimate	ILO statements 2014	2014 Estimate	Variation 2014/2001
Corporatist LMEs	163,643	75,864	177,514	1.08
Independent LMEs	118,962	7389	129,238	1.08
CTU LMEs	60,825	77	74,097	1.22
CMEs	7,149	1,950	5,288	0.74
Total	350,579	85,280	386,137	1.10

Table 1.4. *Number of fatal work accidents according to the industrial relationships around the world (source: International Labor Organization; Hämäläinen (2009) for the 2001 estimate; the author for the 2014 estimate)*

The situation in Asia for the period 2001–2014 is therefore characterized by two polar cases: the nations of the Indian subcontinent, which are marked by significant industrial accident rates, and Japan, whose organizational principles were invalidated during the 2011 tsunami, but which are also involved in the observed pattern of a drop in serious work accidents. If organizational practices today were all equivalent to that of CME nations like Sweden, there would be 14 times fewer work accidents around the world.

1.4. Discussion

The technologies involved in these serious industrial accidents are rather old and the actions to be put into effect are known and have been evaluated. A policy based on instances of reducing work accidents exists. Theoretical reflections on globalization can be evaluated through their dynamic potential and their directional quality to implement this policy of reducing and alleviating industrial risks.

The two critical principles that can be formulated are in opposition to Ohmae and Bauman's theories. The definition of risk is insufficient in Ohmae's theory for decision making by not taking probable potential losses into consideration. The absence of an organizational dimension in Bauman's theory, an aspiration to play on the tensions, on the other hand, seems to be what would be necessary, as a general rule, according to the results associating the most conflictual situations with the slightest prevention of work accidents (see Table 1.4).

Quality–safety–environment procedures are being evaluated by integrating risk analysis in the most explicit way possible (new norms: ISO 9001-2015, ISO 45001). However, with a simple ISO 9001 quality procedure, a reduction in work accidents at establishments with more than 200 employees could be witnessed [EUZ 16]. This is a reflexive dimension that has contributed to the organization in this quality approach through the toolbox used by Kenichi Ohmae. The transition is often the most difficult point for a universal transformation program. Multiple Utopias exist on paper without moving past the project stage. Ohmae has the merit of indicating a path that does not seem to be too unrealistic for transitioning between “Colbertist” national entities and a network of regions with competing policies of attractiveness for companies.

Bremmer supports a theory that is fully contrary to that of Kenichi Ohmae: the contemporary period is, in his opinion, marked by the return of “State Capitalism”. The world would need a single leader, as in Colbert's time, where La Fontaine explained in a fable that the Dragon with one head and 100 tails awkwardly defeats the one with 100 heads and one tail, which represented 17th Century Germany [LAF 62]. The distribution of the roles from the fable made by Bremmer attributes that of the awkward Dragon to an institution that was formed in 2008, the G-20. Bremmer's analysis is in accordance with a search for direct representation of companies through a single political leader and laments the world's situation of collegiate plurality, that of the Triad (United States, European Union, Japan) initially set forth by Kenichi Ohmae, expressed more widely today by the existence of the G-20. This same matter of an absence of leadership and control over globalization can also be found in the

works of Bauman and Bremmer. The dragon of globalization would be a headless monster [BAU 11].

Beck presents several strong points vis-à-vis these approaches with little power to analyze the most contemporary evolutions. His methodological recommendations aim to avoid anchors in a context particular to a single nation, but also to consider the reality of the games of global actors and creative dynamics brought about by catastrophes experienced by the entire planet and not only individual destructive effects [BEC 02, BEC 06, BEC 11, BEC 15]. He advances with an explanation during globalization for a potential drop in social violence due to an improvement in self-control, yet the reliable, controlled data leave no doubt on the reality of this decrease in many nations. By limiting himself to the interpretation of the curve in the number of industrial disasters around the world, which reached its peak in 2004, the analysis by Matthias Beck² [BEC 16], which is situated in the literary movement of the “double standard”, can put forth no explanation for this reversal. The notion of “civilization process” had been introduced by the sociologist Norbert Elias, who had shown the positive role of forming routines through the royal courts in preindustrial Europe. This “civilization process” explained the increase, then the drop in some countries and not others of social violence, reaching a maximum in the early 17th Century in Europe. Globalization would be a “civilization process” in the sense defined by this tradition of sociological and behavioral analysis. On the other hand, a territory of conflicts, as Germany was for a large part of the 17th Century, had seen deterioration in its inhabitants’ self-control for a long period afterwards [ELI 75].

Bauman advances the theory of a new divisive technology: rather than homogenizing the human condition, technological evolution tends to polarize it [BAU 99]. Penal approaches would develop into the management of a marginalized part of the population, whereas some would benefit from new freedoms brought about by technology. The “double standard” would thus initially be penal: some

2 Centre for Economic History at Queen’s University in Belfast. Only homonymy connects him to Ulrich Beck, professor of sociology at the University of Munich who died in 2015.

populations, the most sedentary according to Bauman, would be managed through criminalization, whereas others would enjoy greater freedom. The collateral damage of globalization would be situated in the North and South for marginalized populations [BAU 11]. A new global elite, a new proletariat: this recomposition would take place through penal policies and a disappearance of the Welfare State. The relation with empirical data would lead us to see a “double-standard” problem concerning not only marginalized populations, but a more general function of labor markets. The diagnosis found through technological conservatism (this would be the new technologies that would lead to degradation) has not been confirmed empirically: the joint commission that controls all industrial sites in Bangladesh under the aegis of the International Labor Organization arises above all else from the flaws in the electrical installations and the evacuation procedures in case of fires. The empirical data are often favorable to an interpretation like Hall and Soskice’s [HAL 02], with a single gap with a ratio of 3.5 for the fatal work accident and remuneration between the nations from Sweden’s group (both very individualistic and models of the Welfare State) and that of Bangladesh – and not a global individualistic society with proletarianized areas, as Bauman estimates.

The contrast between the Asian workshop and the large European hardware store is very clear: low salaries and large expansion of industrial risks lean to the side of the Asian workshop. The “double standard” literature continues to have an overly local perception of risks, yet locally, industrial risks have decreased in Europe, and in Asia, improvements come after industrial disasters. For example, Dacca’s parliament greatly increased the minimum wage after the Rana Plaza tragedy.

The elements that can be extracted as favorable to a reduction and alleviation of industrial risks exceed the internal framework of a single production entity. The simple/complex opposition on which Kenichi Ohmae’s initial theory of globalization is built is not the one that is found in the analysis of industrial accidents: accidents take place with rather old technologies and according to repetitive scenarios. The strategic literature, from Sun Tze to Liddell Hart, contains another

opposition between indirect/direct advocating a dodge culture and not the search for decisive battle, which better elucidates a certain number of factors favorable to the continuous improvement of production and service provision processes.

The principles of the separation of powers, e.g. those that govern the separation between the accident analysis office, the service responsible for applying the regulation and the operator in civil aviation, lead to a complexification of the organizational schema. An indirect/direct schema is based on an indirect one that warns of potential confusions of interests. In industrial relations, the two situations that are most marked in one sense or another, Sweden on the side of a very low incidence, Bangladesh in the repetition of industrial accidents that feed political violence, can be placed under analysis between an indirect system, investing in equal management, in the case of Sweden, and a direct system, with parliamentary representation or organizations reflecting each of the interests together, as in Bangladesh. On the global scale, the aggregate results of the study on the evolution of industrial risks between 2001 and 2014 are marked by this opposition arising from the evolution in favor of countries like Sweden and the evolution harmful to the group of countries based on principles of industrial relations, as in the case of Bangladesh.

The nonlinear evolution of catastrophes in the period of contemporary globalization leads to explanations with a combination of factors. It is not a matter of a technological age: it is not because the technologies of the time of contemporary globalization are particularly dangerous. It is the oldest technologies that are involved in the large technological disasters today: the absence of adapted conditioning for explosive materials in Tianjin, the fragility of buildings in Bangladesh. An industrial emergence, particularly in Asia, a growth in vulnerabilities due to that of the planet's population form processes underlying contemporary globalization, which, as indicated by Ulrich Beck's risk sociology, is that of a new catastrophe regime.

