

# PROTECTING A NATION'S ECONOMIC POTENTIAL: PROPOSAL FOR A SCIENTIFIC RESEARCH AGENDA

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## *Abstract*

*This text provides an initial impetus for a scientific approach to the problem of protecting and safeguarding the Economic Potential (EP) of a nation or region. We approach this issue from a general as well as a specific – in this case, Belgian – perspective. We establish that in spite of the strong political and public focus on this matter since 11 September 2001, scarcely any scientific supporting literature is available on an international level. In this contribution, we focus first on situating and defining a number of important concepts, in particular ‘economic potential’ and ‘threat’. We conclude with a series of points of particular interest and provide an initiative for academic and policy recommendations that can serve as a source of inspiration for governments in the months and years to come. We call specifically for the creation of an advisory committee comprising experts from the government, the business world and academia to help narrow the gap in scientific research on protecting economic potential.*

**Keywords:** concept definitions; economic potential; threat; critical infrastructure; policy recommendations

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## 1. NEGLECTING THE OBVIOUS

The level of prosperity in highly developed countries (e.g. Western Europe, USA, Japan) is particularly vulnerable to, and increasingly dependent on, the international economy. Another characteristic feature of these developed economies is their high level of complexity due to a large number of interactions between their economic components or *assets*. Here, we make a distinction between *tangible* (e.g. systems, infrastructure, institutions, research centres, commercial courts, production units) and *intangible assets* (e.g. corporate culture, contracts, democratic principles, fair taxation systems, morality and ethics, efficient and non-corrupt civil service, principles of social consultation).

Therefore, the key question: “How do we protect our prosperity?” or put another way “What can threaten our prosperity?” is not only a question about protecting our current and future tangible assets, but perhaps even more so, recognition of the impact on our level of prosperity – hence the need for protection – of certain ‘critical intangible assets’. Research reported by John Kay (1) shows that culture, institutions and democratic values occupy a fundamental place among the intangible assets of highly developed industrial countries, because they account for differences between countries in a significant manner. After all, modern productive and efficient economies based on the principles of the free-market economy did not emerge out of the blue. They have grown through centuries of evolution of market institutions, which, when enshrined in cultural, institutional and democratic principles, form the basis for a pluralistic political and social context that creates prosperity (2).

The events of 11 September 2001 and the ensuing economic crisis were a spectacular reminder of just how fragile a highly developed industrial and technological society really is. With the attacks on the World Trade Centre in New York (2001), the Atocha railway station in Madrid (2004) and the London Underground (2005), our Western industrial society was brutally confronted with its own weaknesses. The necessary precondition for creating prosperity (through a productive economy) requires political and social pluralism. This however, is also a weakness in our ability to protect Western society. Ironically, it is this selfsame freedom of thought and deed that makes it possible for small groups of terrorists to wreak great havoc on our prosperity. If we wish to maintain and further develop our level of prosperity, then we must take the necessary measures to protect both the current economic system and its future development.

Although the question as to “How do we protect our prosperity?” is extraordinarily relevant, it is apparent that there is no extensive *academic* literature published in English, publicly available at a Belgian, European or even on a global level. We arrived at this conclusion when a search conducted in the SSCI<sup>1</sup> research database on 15<sup>th</sup>

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<sup>1</sup> SSCI: *Social Science Citation Index*. This index is available on the *ISI Web of Science*, a component of the *ISI Web of Knowledge* database. SSCI is the most widely used database for consulting high level quality scientific research literature in the world.

August 2007, entering the keywords: economic – asset – protection – critical – infrastructure – security, yielded no scientific publication results. However, more practical oriented literature on protecting *critical or strategic infrastructure* is available to a lesser degree (3). Such practical literature has come mainly from the United States and, since 2005, also from Europe. The most important source for practical literature in the United States is the *US Department of Homeland Security (DHS)*<sup>2</sup> (4)(5) established in 2002. DHS has already published various studies on infrastructure protection. Since 2005, steps have also been taken by the Commission of European Communities (6) to set up a *European Programme for Critical Infrastructure Protection (EPCIP)*. The Commission of European Communities also intends to develop a *Critical Infrastructure Warning Information Network (CIWIN)*.

Given the embryonic nature of this research field, in this article we shall limit ourselves to raising two fundamental exploratory research questions. First: How can we define the concept Economic Potential *EP*? and the closely related sub-question: How can we define a Critical Infrastructure *CI* of a nation? Second: How can the concept of protection be approached and defined in this context?

We conclude by making a number of recommendations geared primarily to creating structures (*i.e.* organisations, institutions) that should lead to more scientific research into protecting and securing our prosperity and welfare.

## 2. DEFINITION OF ECONOMIC POTENTIAL *EP*

To define the concept of Economic Potential *EP* we begin from two economic theoretical perspectives: the microeconomic approach to resources and the macroeconomic approach relative to the determinants of the Prosperity Level *PL* of a nation.

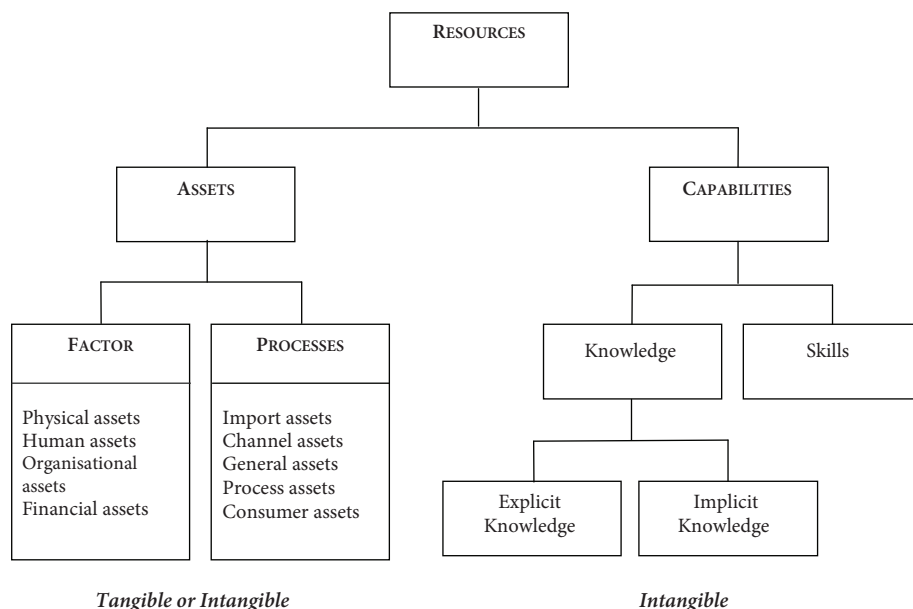
### 2.1. A MICROECONOMIC APPROACH TO RESOURCES

The concept of resources in microeconomics, and more specifically in literature on strategy, has a long history, dating back to works by authors such as Edith Penrose (7), Amit and Schoemaker (8), Birger Wernerfelt (9), and Sanchez and Heene (10). Gosselin (11) defines this concept as: “Resources are all the assets and capabilities directly or indirectly accessible to a company or firm, that enables it to create and implement a strategy leading to the creation of a sustainable competitive advantage.” These resources, according to Gosselin (12) comprise assets: “All the tangible and intangible capital resources directly or indirectly accessible to a company or firm,” (*i.e.* capital

<sup>2</sup> The precursor of the *US Department of Homeland Security* is the *Office of Homeland Security*, established in 2002. At the time of its enactment, this Office reported to the staff of the President of the United States. Publications for the period 2002 and 2003 appeared under the name ‘Office of Homeland Security’ and not under the name ‘US Department of Homeland Security’.

resources that a company has built up), and capabilities: “All of the accumulated knowledge and complex bundles of skills which make it possible, through organisational processes, to use assets in a productive manner so as to build up sustainable competitive advantages.” Capabilities differ from assets in that no monetary value can be put on capacities, which are consequently intangible.

Figure 1. Resources: conceptual classification



Source: Gosselin (13).

Sometimes, the term ‘assets’ is used for tangible or physical resources, while the term ‘capabilities’ refers to intangible or invisible resources. Examples of resources are cited by Wernerfelt (14): internal knowledge of technology, highly skilled employees, trading contracts, machinery, efficient procedures, trademarks, capital. Figure 1 gives a diagram of the relationship between the constituent components of this concept of resources.

## 2.2. A MACROECONOMIC APPROACH TO THE DETERMINANTS OF THE PROSPERITY LEVEL *PL*

Neoclassical macroeconomic theory states that the prosperity or development level of a nation is a function of the competitive position<sup>3</sup> of that nation. We define the *Prosperity Level PL*, by analogy with the definition of prosperity proposed by De Clercq (15), as the *Degree to which needs are satisfied with the help of scarce resources*. De Clercq adds:

“As both priced and non-priced scarce resources, as well as tangible and intangible resources, are subjected to economic analysis, prosperity is determined by all these factors” (16).

The classic criterion for measuring Prosperity Level *PL* in macroeconomic theory is the per capita Gross Domestic Product (GDP) (17).

Research conducted by Harvard University Professor Michael E. Porter (18)(19), into the formulation of industrial-organisational-economic theories, has led to the insight that the Prosperity Level *PL* of a nation depends on a number of economic, strategic, and structural determinants. In this regard, Porter states:

“National prosperity is created, not inherited. A nation's competitiveness depends on the capacity of its industry to innovate and upgrade. Companies gain advantage against the world's best competitors because of pressure and challenge. As the basis of competition has shifted more and more towards the creation and assimilation of knowledge, the role of the nation has grown. Differences in national values, culture, economic structures, institutions and histories all contribute to competitive success” (20).

In summing up, Porter (21)(22) states that there are four determinants (Figure 2) that decide the competitive position and ultimately the prosperity (*i.e.* economic value creation, prosperity creation, prosperity level) of a nation:

First, the production *Factor Conditions*.<sup>4</sup> With this determinant, we refer the scarce resources at the disposal of a nation to produce goods and services. Porter (23) draws a distinction between standard production factors and specialised production factors. *Standard factors* comprise: raw materials, climate, geographic location,

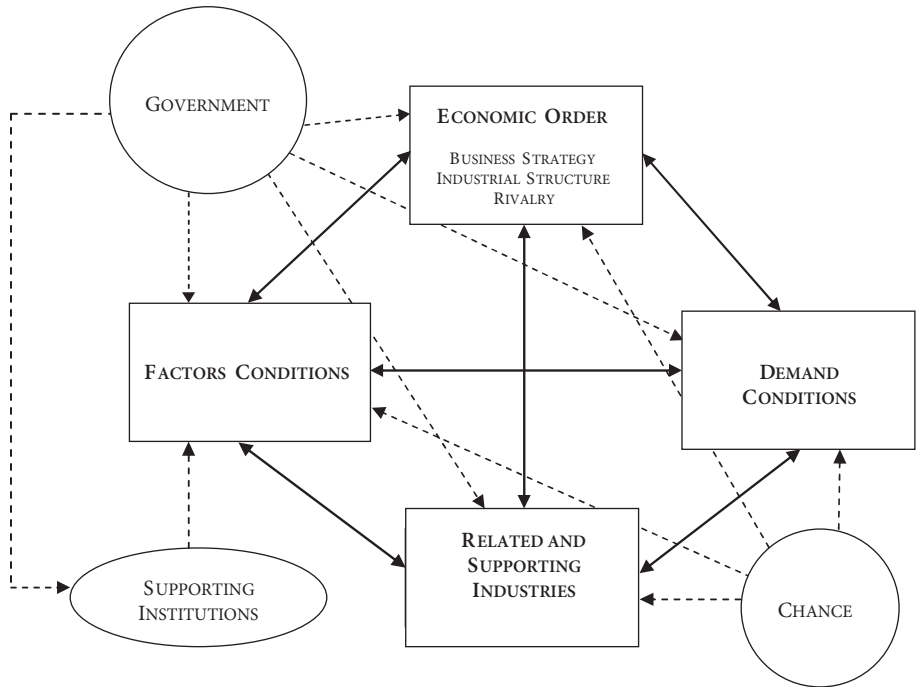
<sup>3</sup> The more competitive an economy is, the more goods and services it can produce, and thus the higher the per capita GDP will be (at a relatively limited growth of the population) – and consequently the higher the Prosperity Level *PL* of the nation.

<sup>4</sup> The economy recognises five production factors (*cf.* 5Ms): (1) *Men*: the skill levels of manual workers and clerical employees, (2) *Machines* or infrastructure, (3) *Materials* or the environment, whether raw materials are available in the nation, (4) *Management*: competence levels of the managerial staff, (5) *Money* or the capital markets.

unskilled and moderately skilled workforce and capital. Those factors can be obtained by any company and, hence, do not create sustained competitive advantage. *Specialised factors* of production comprise: advanced infrastructure and skilled labour (e.g. telecommunication infrastructure, university institutions, highly skilled workforce). Specialised production factors are characterised by their dynamic nature. To be productive they must be continuously created, developed, maintained and given further training. Specialised factors lead to sustainable competitive advantages because they involve heavy, sustained investments that make them difficult to create and to duplicate (hence valuable) and as a result are not accessible to all companies. Second is *Demand* or the structure of market forces for the nation's products and services; demand can be decisive in the degree to which innovation of international importance takes place. The third determinant is *Related or Supporting Industries* (i.e. a network of sectors) that are internationally competitive, and with which alliances can be forged. The spatial proximity of upstream or downstream industries facilitates exchange of information and promotes exchange of ideas and innovation. Finally, the fourth determinant is the *Economic Order* or the institutional and social framework within which competition takes place. This includes the way in which a nation pursues a policy for improving or reducing production factors, business creation and entrepreneurship, the way in which companies are organised and managed, and the nature of competition in a nation, a country or a region. Economic theory states that growth in competition in a nation, will increase productivity and innovation and as a result increase the competitive advantage of the nation.

We suggest that each of these four determinants is influenced by two additional variables: chance factors and the government. Chance factors are unexpected effects on the international competitive position of a company, a country, a region or a nation, caused by (non-limitative): inventions, technological breakthroughs, wars and strong regional demand. The role of the Government, on the other hand, lies in influencing the dynamics between the three determinants (stimulating or reducing). This role can have various facets, ranging from making available and maintaining the Critical Infrastructure CI to providing stimulation through education and training programmes on entrepreneurship (cf. Figure 3 for a list of elements which determine the prosperity level of a nation and which can be influenced by the government). The recognition of this important role that the government plays in determining the prosperity of a nation makes it all but self evident that the government has a role in securing the coordinated protection of critical determinants ( $D_i$ )\* (Figure 3 and Figure 4) of the Prosperity Level *PL*. In Belgium, this role is by law reserved for the State Security Service, which must protect both the *Scientific Potential* and the *Economic Potential EP* (26).

Figure 2. Determinants of the Competitive Advantage of a Nation

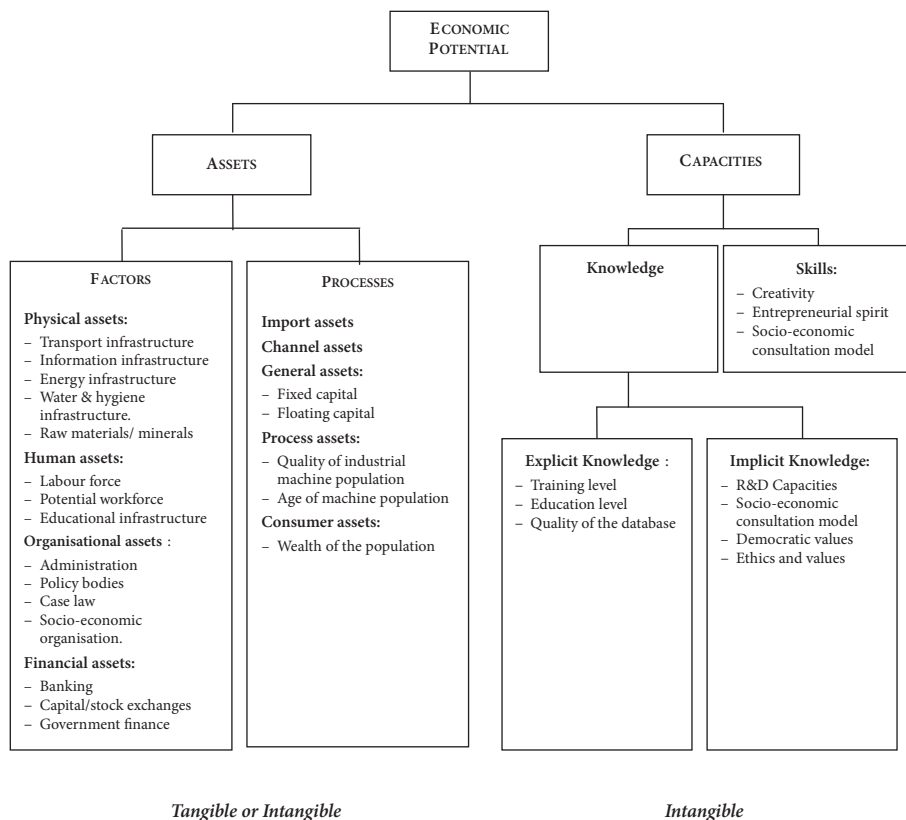


Source: Porter (24)(25) – Extensive model.

### 2.3. DEFINITION OF THE CONCEPT OF ECONOMIC POTENTIAL *EP*

On the basis of the ongoing discussion of and approach to the determinants of the prosperity potential of a nation, we would to define the concept of the *Economic Potential EP* of a nation as: *The capacity for creating sustainable prosperity*. The term ‘sustainable’ refers to the capacity to continue to create prosperity in the short and the long term. The *EP* of a nation is decided by a number of determinants ( $D_i$ ) that govern the scope and development of the Prosperity Level *PL* of a nation in the long and the short term. These determinants ( $D_i$ ) can be divided into *tangible and intangible determinants*. For a full summary see Figure 3.

Figure 3. Determinants of the Economic Potential  $EP$  of a Nation



Given the extent of the concept of Economic Potential  $EP$ , we will introduce an *Impact Degree II* in a context of Threat  $B$  (cf. paragraph 3) of the Economic Potential  $EP$ . The Impact Degree II measures the impact of the determinants  $D_i$  of the  $EP$  on the Prosperity  $PL$ . Here we make a distinction between the impact in the short term (ST) and the long term (LT).

We define the *Short Term Impact Degree*  $\Pi_{ST}$  as: *The relative sensitivity of the Prosperity Level  $PL$  (% GDP/Capita) to a determinant  $D_i$  of the Economic Potential  $EP$ .* We can also describe the Impact Degree II as the relative change  $\Delta$  of the Prosperity Level  $PL$  (from an initial situation  $\alpha$ ) caused by a relative change  $\Delta$  to the value of the determinant  $D_i$ .

Formula [1] determines the Short Term Impact Degree  $\Pi_{ST}$  round an initial situation  $\alpha$

$$\Pi_{ST} = \frac{\left[ \frac{\Delta PL}{PL} \right]_{\alpha}}{\left[ \frac{\Delta D_i}{D_i} \right]_{\alpha}} = \frac{D_i}{PL} \left[ \frac{\Delta PL}{\Delta D_i} \right]_{\alpha} \approx \frac{D_i}{PL} \left[ \frac{\partial PL}{\partial D_i} \right]_{\alpha} \quad [1]$$

The economic significance of  $\Pi_{ST}$  is: the sensitivity or extend to which a nation's prosperity changes (measured via the per capita GDP), at an incremental change or modification of the value of the determinant  $D_i$  (in context of Threat  $B$  on the  $EP$ , always a drop).

We define the *Long Term Impact Degree*  $\Pi_{LT}$  as: *The difference between the compound annual growth rate (CAGR)  $g$  of a projected development of the Prosperity Level  $PL$  over  $T$  years on the one part, and the development of the Prosperity Level  $PL$  over  $T$  years, as a result of a change  $\Delta$  in the value of the determinant  $D_i$  in year  $T=0$  on the other part.*

$$\Pi_{LT} = [g]_{D_i} - [g]_{\Delta D_i} \quad [2]$$

On the basis of equation [3], and for small values of growth  $g \ll 1$ , the Long Term Impact Degree  $\Pi_{LT}$  can be calculated by approximation by formula [4]:

$$PL_T = PL_0 (1 + g)^T \quad [3]$$

$$\Pi_{LT} \approx \left[ \frac{\ln(PL_T) - \ln(PL_0)}{T} \right]_{D_i} - \left[ \frac{\ln(PL_T) - \ln(PL_0)}{T} \right]_{\Delta D_i} \quad [4]$$

We suggest taking the term  $T = 5$ , for two reasons. Firstly, because five years is usually the time a nation needs to (re) construct major infrastructure and facilities, and secondly because projections of the Prosperity Level  $PL$  (measured via the GDP/capita) are insufficiently reliable and therefore, usable, in the longer term. In the specific case of Belgium we recommend using data from the Federal Planning Office or the National Bank of Belgium when making long-term GDP projections.

The proposed impact degrees  $\Pi_{ST}$  and  $\Pi_{LT}$  must enable us to identify the critical determinants  $(D_i)^*$  of the Prosperity Level  $PL$ . It is these critical determinants  $(D_i)^*$  that must be protected as a matter of priority against incidents such as terrorist attacks. Specialised research is needed to develop a measurable and practicable criterion for determining the critical determinants  $(D_i)^*$  of the  $EP$  of Belgium, following the studies initiated in 2003 in the United States and in 2005 in the European Union. To this end,

we refer in particular to the reports of the US Department of Homeland Security (27) on Critical Infrastructure CI, the report by Marsh (28), the report by Booz-Allen & Hamilton (29) and the recent green paper on infrastructure security by the Commission of European Communities (30). Of interest also for the analysis method is the approach used by Devogelaer and Gusbin (31) to calculate the economic impact of the collapse of Critical Infrastructure CI, in this case, the electric power supply.

### 3. DESCRIPTION OF THE CONCEPT OF THREAT $B$

We have already defined the concept of Economic Potential  $EP$ , but the concept of Threat  $B$  still requires definition. Our chosen method of approach here is to utilize the concept of risk. We shall begin with the postulate that a Threat  $B$  cannot be approached in absolute terms, but is instead the consequence or product of: the probability  $P$  that an incident (e.g. terrorist attack) will occur, and the Impact Degree  $\Pi$  of this incident on the Prosperity Level  $PL$ . Based on our definition of  $\Pi$  (cf. formula [1]) there is a connection between the Prosperity Level  $PL$  and the determinants  $D_i$  of the  $EP$ . This means that a high Impact Degree  $\Pi$  will lead to a reduction in the Prosperity Level  $PL$  through a significant drop in the value of a determinant  $D_i$  which will in turn cause the  $EP$  of a nation to fall (this follows on from the definition  $EP$ ). As the  $EP$  is composed of determinants  $D_i$  this is equivalent to measuring the probability  $P$  of an incident on a determinant  $D_i$  and the Impact Degree  $\Pi$  on the Prosperity Level  $PL$  via the effect on the determinant(s) of the  $EP$ .

We therefore define a *Threat  $B$*  as: *The product of the probability  $P$  of an incident (e.g. terrorist attack, natural disaster, technical defect) on a determinant  $D_i$  and the Impact Degree  $\Pi$  that this incident has on the Prosperity Level  $PL$ .* This definition can be shown mathematically as:

$$B = [P(D_i)] \cdot [\Pi(PL, D_i)] \quad [5]$$

As we have defined the Impact Degree  $\Pi$  in both the short and long term, we can now define and calculate the *Short-Term Threat  $B_{ST}$*  and the *Long-Term Threat  $B_{LT}$* . It adequately replaces, in formula [5], the Impact Degree  $\Pi$  factor by the values  $\Pi_{ST}$  and  $\Pi_{LT}$  respectively. Moreover, we note that the determinant  $D_i$  can also be a critical determinant  $(D_i)^*$ . This now can replace, formula [5], the determinant  $D_i$  by  $(D_i)^*$  to define the concept of *Critical Threat  $B^*$* . The latter can now be calculated for the short or long term.

We postulate that Threat  $B$ , defined according to formula [5], will run its course with a maximal (Critical Threat  $B^*$ ), two submaxima (Threat  $B$ ) and a minimum (Acceptable Threat). We illustrate this reasoning through Figure 4 where four situations can occur: The Impact  $\Pi$  of an incident can be high or low, while the probability

$P$  of an incident can also be high or low. This leads to 2x2 situations that can be considered as a Critical Threat  $B^*$ , Threat  $B$  or Acceptable Threat. In practical situations, up to  $5 \times 5^5$  are at times used, where each of the possible situations of the variables  $\Pi$  and  $P$  can be measured with precision.

Figure 4. Schematic Relation between Impact  $\Pi$  and Probability  $P$

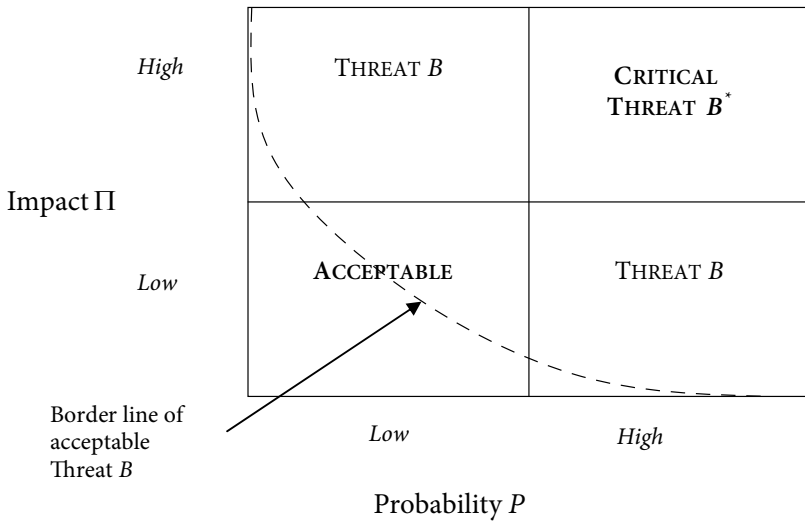
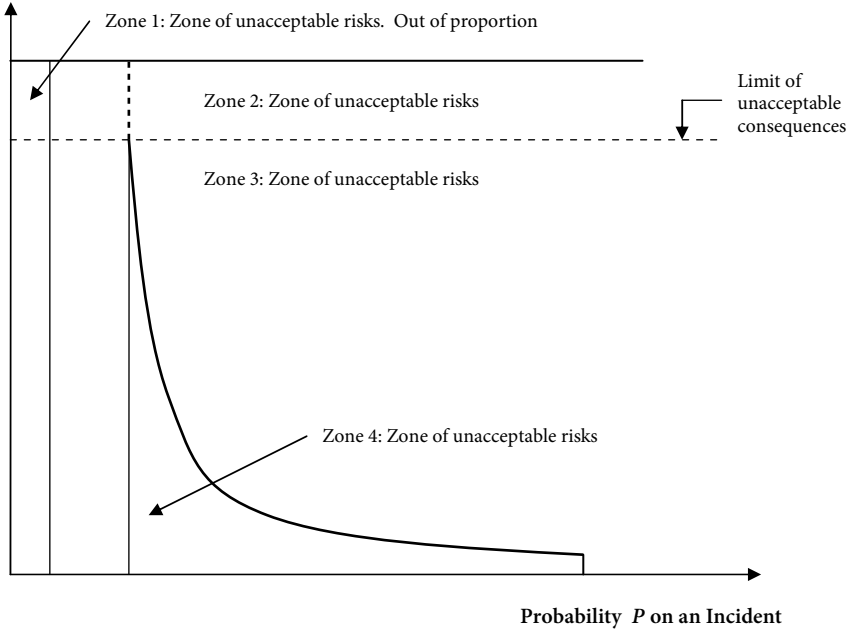


Figure 4 leads to Figure 5, where the different zones of acceptable or unacceptable threat are clearly indicated. In Figure 5, we can distinguish iso-threat hyperbolas: these are curves for which the product of  $\Pi$  with  $P$  has a constant value, or where  $\text{Threat } B = \Pi \times P$  has the same value.

<sup>5</sup> Five levels for Impact  $\Pi$  and five levels of Probability  $P$ .

Figure 5. Curves with constant Threat  $B$  (iso-threat hyperbolas)

Impact  $\Pi$  of an Incident



#### 4. CRITICAL INFRASTRUCTURE CI

By defining the concepts of Threat  $B$  and Critical Threat  $B^*$ , through two variables: Impact Degree  $\Pi$  and Probability  $P$ , and due to our knowledge regarding the theory of the determinants  $D_i$  we know which determinants have the most impact on Prosperity Level  $PL$ , and can now draw up a priority list of those that are critical. A specific and important subset of critical determinants consists of those pertaining to the infrastructure (cf. Paragraph 2.2). We call this subset of critical determinants the *Critical Infrastructure CI*. Marsch (32) describes a number of possible critical determinants  $(D_i)^*$  relative to the Critical Infrastructure CI. It follows from our argument that this list, given in Table 1, is only an initial list and that further research is needed thereon.

**Table 1. List of possible Critical Infrastructure CI**

Type of Infrastructure	Sectors and Systems
Information and Communication	Telecommunication <sup>(2)</sup> Internet Public computer/ Government's computer centres
Physical distribution	Motorways Harbours Railway network Waterways Pipelines Airports/transport Metro lines and bulk transport Lorry transport Delivery services and logistics and post
Energy	Electricity generation/transmission/distribution <sup>(1)</sup> Natural gas Oil Coal
Banking and Finance	Banks Financial services Investment companies Payment systems Shares Stock market
Vital human services	Water supply <sup>(3)</sup> Emergency services (Police, Ambulance, Medical) Government services

Index<sup>(1),(2),(3)</sup> indicates, in decreasing order of importance, the most researched and studied infrastructures. Source: Marsh (33), US Department of Homeland Security (34).

## 5. CHALLENGES AND RECOMMENDATIONS

The first challenge is to *stimulate* academic research in the protection and security of a nation's Economic Potential *EP*. This research field is still in its initial study phase, characterised by a lack of (a) the operational definitions of the most important concepts and constructs; (b) valid and appropriate measuring instruments and methods; (c) reliable qualitative and/or quantitative empirical research and (d) formulation of theories. Initially, one important task would consist of framing and defining the

research field so that subsequent initial theories on the basis of qualitative and quantitative research can be developed.

Furthermore, *greater importance* should be attached to research conducted into the protection and security of a nation's the Economic Potential *EP*, by setting up a research infrastructure and by increasing the research means and resources in this field. In the specific case of Belgium, we believe that to attain this objective, a *National Advisory Committee* must be created, composed of experts from government, the business world and universities. We believe that this National Advisory Committee should set five key tasks: (1) decide upon research priorities and programmes by bringing together the different policy makers; (2) raise and manage research funds; (3) organise logistical support on setting up and implementing scientific research programmes; (4) draw up annual reports and advise the relevant authorities; (5) establish and manage international contacts and networks. Specific government and private authorities that are eligible in Belgium would include: the State Security Service, the Federal Planning Office, the Military Intelligence Service, the National Bank of Belgium (NBB/BNB), the Federation of Enterprises of Belgium (VBO/FEB), and the Coordinating Body for Threat Analysis (OCAM)<sup>6</sup>. We believe that perhaps the Royal Academies of Belgium, through their science and technology councils<sup>7</sup>, can make a valuable contribution in terms of coordination, policy preparation and research.

The third challenge is to develop a central *database* to support the proposed research programme. We think that, based on its legal remit (35), the State Security Service has an important administrative or coordinating role to play in gathering reliable information.

A specialised working group should determine the procedures for structuring the above mentioned organisation (*i.e.* mission, policy statement, criteria for appointing members and responsibilities, structure, task descriptions, procedures, type of reports, purpose of the meetings, drawing up meeting schedules, budgets, and infrastructure).

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<sup>6</sup> The Belgian law of 10 July 2006 establishes, under the joint authority of the Minister for Internal Affairs and the Minister for Justice, the OCAM (*Organe de Coördination pour l'Analyse de la Menace*) to (1) develop information interchange between all the parties involved in the fight against terrorism and extremism; (2) draw up common analyses of the threat. OCAM will therefore, together with the State Security Service, the Military Intelligence Service, the Police, the Federal Prosecutor's Office, the Customs, and the Crisis Centre, collate pertinent information and/or in-house analyses, which will be processed into a common threat analysis.

<sup>7</sup> There are currently two councils for engineering, applied or technological sciences in the Royal Academies of Belgium: (1) CAWET (*Comité van de Academie voor Wetenschappen en Techniek*): Academy Council for Science and Technology, connected to the Koninklijke Vlaamse Academie van België (KVAB). However, as of 2008, a newly formed Class of Technical Sciences, within the KVAB, will replace this council; (2) CAPAS (*Comité de l'Académie pour les Applications de la Science*): Academy Council for Applied Sciences, connected to the Académie Royale de Belgique. CAWET and CAPAS jointly coordinate their activities at international level through BACAS: *Royal Belgian Academy Council of Applied Sciences*.

At a Belgian level, an initiative by the Minister for Justice or the Minister for Internal Affairs would be desirable.

Finally, we have listed a number of specific *research problems* that the new National Advisory Committee can take into consideration when drawing up its research agenda:

1. Conducting a thorough international comparative literature study into the possible approaches for measuring and managing the Economic Potential  $EP$  of a nation; in this case Belgium. It is clear that the conventional databases (e.g. Web of Science) for finding research literature are probably insufficient here. Specialised authorities, literature and/or reports from governmental research committees must be found and consulted. Such a meticulous study of literature could receive strong support from the proposed National Advisory Committee, and thus facilitate access to international authorities.
2. Drawing up a research database for calculating and developing further the proposed operational definitions. This should make it immediately possible to define the determinants  $D_i$  of the Economic Potential  $EP$  and rank them in order of priority. This research database will also enable the usability of the proposed operational definitions for an empirical test.
3. Investigating the impact (i.e. the relation between) the determinants  $D_i$  of the *advanced production factors* (cf. Paragraph 2.2) on Economic Potential  $EP$ . These determinants  $D_i$  underpin our capacity for innovation and in highly economically developed countries account for a sizeable part of current and future prosperity.
4. Conducting research into the list of *Critical Performance Indicators* CPI that an impact on Economic Potential  $EP$  and therefore on Prosperity Level  $PL$ . Here, we are focusing in particular on effectiveness and efficiency indicators in a context of protection against a terrorist attack. Possible CPIs include:
  - The number of users ( $N$ ) who lose a service after an attack/incident,
  - The time ( $T$ ) during which a given infrastructure is no longer available after an attack/incident,
  - The number of interchanges ( $n$ ) that are no longer available after an attack/incident. This is a criteria for both the scope and effectiveness of an attack;
  - The Financial Impact  $I_F$  of the loss of an infrastructure or determinant  $D_p$ ,
  - Level of user-confidence in an infrastructure or determinant  $D_i$  after an attack/incident,

We think as well that attention in such a study should also be given in the setting up simulation models to check for the effectiveness of its protection measures. The definitions developed in this contribution constitute an important and necessary first step for being able to develop quantitative simulation models.

## 6. CONCLUSION

*Abu-Leith Al-Libi*, spokesman for Al-Qaeda, was prophetic in 2002 when he said:

“[Al-Qaeda] has regrouped and will expand its war to include assassinations and attacks of the ‘enemy’s weak infrastructure’.”

The attacks in Madrid on 11 March 2004 and in London on 7 July 2005 are examples from which we should learn. Al-Qaeda is but one of the many organisations that are hell-bent on de-stabilising Western culture, governments and economies. The difference however between Al-Qaeda and other terrorist organisations is that Al-Qaeda understands the *Economy of Terror*. Acts planned by them are increasingly rooted in Return on Investments (ROI). We believe therefore, that our energy supply dependency, and more specifically the vulnerability via geographic concentration<sup>8</sup> of the logistic infrastructure for oil and gas, could become a prime target for terrorist attacks since this could have a major impact on the world economy (36).

Belgium should not be excluded as a target. Belgium manages one of the most important intersections for the import and distribution of natural gas in Europe at Zeebrugge (via Fluxys and Distrigas). Furthermore, Brussels’ rather obtrusive position as capital of Europe is home to hundreds of international political, diplomatic, commercial, non-governmental and military organisations (e.g. the headquarters of the European Commission, NATO and SHAPE). Given these two observations, sufficient attention, means and resources are needed from the Belgian government for the adoption of a structural approach to the specific protection of our Economic Potential *EP*, and not just Critical Infrastructure *CI*. The establishment of a National Advisory Committee could constitute an important first step in this direction. We therefore call on the relevant Ministers for Justice and Foreign Affairs of Belgium to take the necessary initiative.

The major challenge, in the early 21st century, will consist of preserving our democratic freedoms in an increasingly globalised society, where the majority of the world’s population does not live according to, is not educated by and is not familiar with, the principles of our Western democratic society. Worse still, is that this same majority, at times, fundamentally rejects our Western principles. More than 60 years ago, Bertrand de Jouvenel wrote that no democracy can defend itself against a dictatorship without running the risk of becoming a dictatorship itself (37). This challenge consequently leads to a real paradox: *We risk losing our freedoms and prosperity in an attempt to protect them*. Lest we forget, our Western cultural, institutional and demo-

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<sup>8</sup> In 2006, 18% of the daily world oil production passed by ship through the Strait of Hormuz (Saudi Arabia) and 13% through the Strait of Malacca (Indonesia). (100% = 85 million barrels/day). Projections show that this will probably increase in the future.

cratic principles form the basis for a pluralistic political and social context that lies at the root of the high prosperity level seen in developed Western economies.

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