

Karius, Tim

Research Report

Intellectual property and intangible assets: Alternative valuation and financing approaches for the knowledge economy in Luxembourg

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EIKV-Schriftenreihe zum
Wissens- und Wertemanagement

Intellectual Property and Intangible Assets
Alternative valuation and financing approaches for
the knowledge economy in Luxembourg

Tim Karius

IMPRESSUM

EIKV-Schriftenreihe zum Wissens- und Wertemanagement

Herausgeber: André Reuter, Heiko Hansjosten, Thomas Gergen

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European Institute for Knowledge & Value Management (EIKV)

c/o M. André REUTER - 27d ,rue du Scheid

L-6996 Rameldange - GD de Luxembourg

info@eikv.org

www.eikv.org

Executive Summary

With the disappearance of the bank secrecy and loss of e-commerce tax in year 2015, Luxembourg will be confronted to an existential challenge. Therefore, Luxembourgish economy has to reinvent itself and develop new key drivers boosting country's economic growth.

Well known for the strong fund industry, Luxembourg needs alternative burst of growth to ensure long-term sustainability. An option could be innovation that arises from a knowledge-based economy. Intellectual property (IP) and intellectual capital (IC) driven companies like Amazon, SES or Netflix have market advantages, create jobs and drive innovation through the use and dissemination of new technology.

However, a major problem for innovative companies, whose main enterprise value comprises identifiable or unidentifiable intangible assets, remains the funding. Specifically for Luxembourg, the funding solutions for those companies are very restricted. The trigger according to the funding problem for innovative companies consists in the absence of collaterals. At the launch period, many IP and IC driven companies have only small capital resources and their business value persists largely of intangibles. According to this initial situation, banks would today refuse the funding of this innovative business.

During the last years, the main focus of the Luxembourgish government was the promotion of Luxembourg as an innovation hub such as the launch of Luxinnovation or the Cluster Initiative. Apart from the state aid program, they missed to consider IP and IC as an economic good that needs long-term financial support in order to create prospective values. Faced to the previously mentioned capital outflows due to the abandon of the bank secrecy, business of providing fund and consultancy to such innovative business could be a chance for Luxembourgish economy, thus refining their market and serving a very promising niche market.

Identifiable or unidentifiable intangible assets possess and create a huge value and often outperform the value of tangible assets. Therefore an alternative valuation and funding approach in Luxembourg has to be developed. This master thesis deals with the problematic of determining a realistic value of company's intangibles that would give companies not only the access to alternative funding forms, but also to the classical bank loan.

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Table of Abbreviations

IP	Intellectual Property
R&D	Research and development
IC	Intellectual Capital
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards
SME	Small and Medium Enterprise
R&D	Research and Development
GDP	Gross Domestic Product
RDI	Research Development Innovation
CSSF	Commission de Surveillance du Secteur Financier
S&P 500	Standard & Poor`s 500
IPIL	Institut de la Propriété Intellectuel
ISO	International Organization for Standardization
DIN	Deutsches Institut für Normierung
RCAVI	Realistic Corporate Added Value Index
EU	European Commission
EPO	European Patent Office
IT	Information Technology
ACA	Angel Capital Association
RIV	Realistic Intangible Valuation
HC	Human Capital
IC	Information Capital
OC	Organization Capital
LBAN	The business angel network
SICAR	Société d'investissement en capital à risque
SIF	Fonds d'investissement spécialisé
SNCI	Société Nationale de Crédit et d'Investissement
OPCVM	Organisme de placement collectif en valeurs mobilières
FIS	Fonds d'investissement spécialisés
FIA	Fond d'investissemnt alternative
M&A	Merger & Acquisition

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1 Introduction

In today's world, innovation, technology and information are leading competitive factors and intangibles are often important and valuable assets of a company. That is probably one of the reasons why the Luxembourgish government decided at the beginning of the 21th century to transform their economy from a leading finance stronghold to a research and development (R&D) based economic approach. In relation to the disappearance of bank secrecy, this seems to be on the first look an economic revelation for Luxembourg. Therefore, the government has developed a strong legal basis for the protection of intellectual property (IP). Moreover, the creation of an interesting tax environment, dedicated to income and capital gains resulting from IP, is an incentive to attract innovation or innovative businesses. At the first glance, Luxembourg seems perfect for IP and IC driven companies unless the companies do not need private financing. This thesis tries to analyse the fact that Luxembourg has neglect this essential factor in order to realise successfully such a drastic economic change.

Both, valuation and funding of intangibles are in Luxembourg still at an early stage. As the funding is related to valuation, adequate evaluation approaches are necessary. Therefore, the author of the thesis has decided to elaborate a risk management approach for financial institutes that allows assessing the investment risk of IP and intellectual capital (IC) driven companies and evaluating intangibles as collaterals for their funds.

Traditional valuation approaches are based on the discounted or the future cash flow method. However, according to the author, this approach isn't implementable for IC and IP. The analysis of historical data and their extrapolation to the future clearly show that the real value of such assets will probably never be calculated correctly. The life cycle of assets is unpredictable and dependent from other tangible assets, leading to the previously mentioned uncertainty of intangibles values.

Today, in times of crisis, funding has become extremely difficult for corporates, especially for those who do not have direct capital market access and for those whose assets are primarily based of intellectual nature by the reason of their not determinable default risk. Therefore, a need for alternative valuation and funding approaches is evident.

1.1 Scoop of the work

According to the development of the Luxembourgish economy compared with the economic developments due to the important changings in the financial sector of Luxembourg, the author wants to elucidate with this thesis the importance of IP and IC for the Luxembourgish economy, especially for the Luxembourgish financial centre. To become a global player on the innovation and R&D business area the Luxembourgish economy has to reinvest itself. But to convert Luxembourg from a leading financial hub to a leader position in an research, technological development and innovation centre it isn't sufficient to advertise oneself as an innovation hub, Luxembourg has to include the whole private and public economy.

To become innovative, Luxembourg has to support IP and IC. Those assets are the main drivers for innovative companies. For this reason, a second objective of this thesis is to create a valuation approach that respects the intangible market risks. For example the IP default risk or the IC default risk by revering the lifetime of intangibles and the financial potential of intangibles. One of the most important problems of corporate valuation according to IP and IC based innovative businesses is that they have no or only a few classical valuable fix assets. They have no fix point in their valuation calculation.

Furthermore, once those innovative valuation approaches of intangibles are developed the thesis tries to develop alternative funding possibilities for those innovative companies. One aim should be that banks could use intangibles as collateral in their corporate funding.

Often it is a simple idea or the personal know-how that represent a complete business knowledge and value of an intangible driven company. Normally the options to get funding for such a company are quite rare. For sure their exist venture or private equity, as we will see later, but the access for a bank loan is normally inaccessible. The reasons therefore are the lack of collateral. According to the Author making intangibles, tangible could be an answer to the problem.

The thesis is, however, focused on developing a realistic and feasible valuation method of intangibles in order to progress possible alternative funding opportunities.

1.2 My motivation for the topic

The high potential in corporate funding motivated my choice for this topic and as main subject of this thesis. Being a pioneer on the area of intangible valuation and financing opened the opportunity to introduce a personal line to this topic. IP and IC are on one hand fascinating and on the other hand challenging.

To emerge the value of those assets, an alternative valuation approach has to be developed. Having worked for several years in the commercial department of financial institutions allows me to afford the problem of innovative corporate funding. Without direct capital market access and with assets of intellectual nature, funding has become extremely difficult or even impossible.

Consequently, this thesis' intention is to develop alternative capital market funding sources such as IP and IC securitization by giving banks the opportunity to value those intangibles in a market realistic approach.

1.3 Methodology

Research and secondary literature in the domain of intangibles and their valuation are quite rare or even inexistent. The few books dealing with IP valuation are all based on traditional valuation approaches, which are useless and not adapted for the application on alternative funding approaches. Moreover, high level of secrecy and the lack of information about innovative companies and financial institutes make it even more difficult to get data from the market participants. Therefore, financial magazines as well as factsheet from the European commission working on the field of IC and IP were a major source of information for this work, supplemented by short articles published in industry and finance magazines or specialized webpages.

The alternative funding approaches are based on existing methods in combination with new methods based from the fund or banking sector. According to the author, all of these approaches are marketable according to the Luxembourgish legislation. Today, this market is still an untapped niche that needs a forerunner that can make use it.

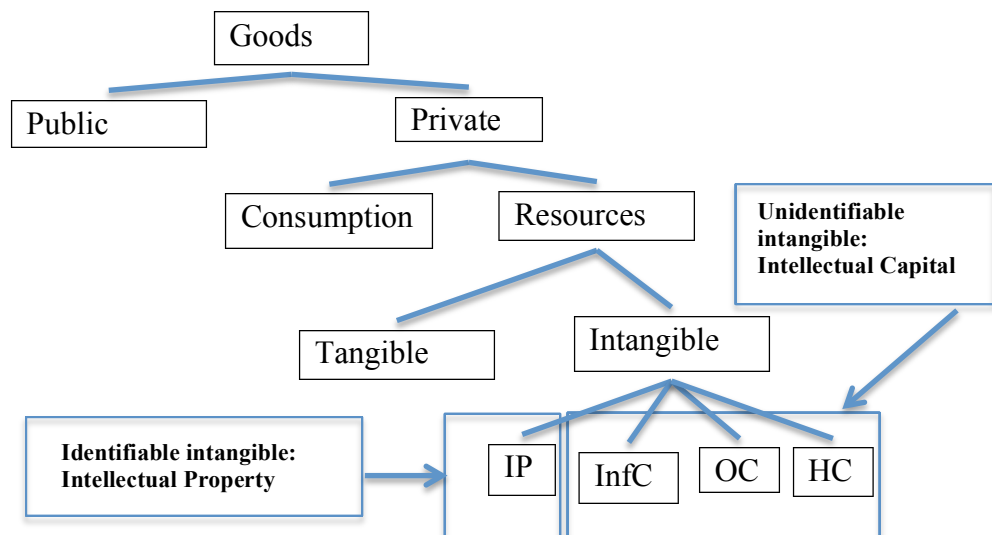
2 Intangible Assets in a Knowledge Economy

2.1 Intangibles Assets, the great unknown

“Intangible assets are all the elements of a business enterprise that exist in addition to working capital and tangible assets. They are the elements, after working capital and tangible assets that make the business work and are often the primary contributors to the earning power of the enterprise. Their existence is dependent on the presence, or expectation, of earnings”.¹

Intangibles are all resources that enable a company to provide better. (See figure 1)

Figure 1: The difference between tangible and intangible asset



Source: Own draft

Those assets could be: Intellectual Property (IP, Patents, etc.), Human Capital (HC, Workforce quality, etc.), Organizational Capital (OC, Management quality, Leadership, etc.) or Informational Capital (InfC, differentiation to another company, Information transfer, networks, etc.).

According to the Luxembourgish IP office director Lex Kaufhold the only assets that create added value in a global world are creativity, knowledge and know-how. In Luxembourg, the IP office has already implemented certain measures to simplify the legal protection of IP, and according to M. Kaufhold they are bearing fruit. The government statistics shows us that patenting applications grew from 22,139 in 2010 to 22,568 in 2011.

¹ Cf: Smith, G., Parr, R., Valuation of Intellectual Property and Intangible Assets, p.83

“We’ve ten times more applications than our Belgian neighbours and seven times more than our Dutch neighbours,”²

Intangibles are today’s major value drivers for companies, industries and regions and their measurement, analysis and management is a decisive effort in the direction of understanding and improving value creation with reference to the different economic levels and sectors. However, even if the importance of intangibles is widely accepted, IP and IC are economically poorly understood and unused.

Nevertheless, the necessity for accepting new and innovative models for the evaluation of intangibles are increasingly recognised and not at least because of the accounting standards revolution in Europe requiring the inclusion of intangibles on the International Financial Reporting Standards (IAS/IFRS). In particular IFRS 3 on business combination and IAS 38 on intangible assets and their usefulness for economic decision-making is highly discussed.³

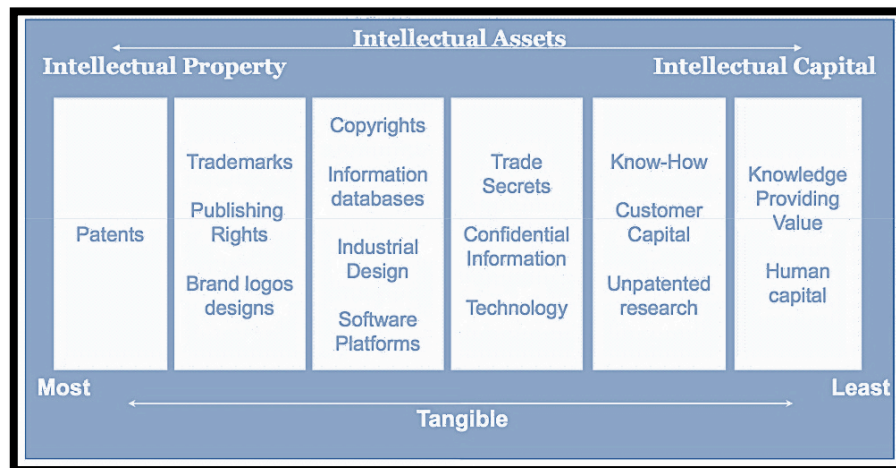
Companies have two categories of assets that are necessary for their productivity. First, the touchable IP’s called tangible assets, which you can touch, taste or see. These categories of assets are loosing importance in a knowledge-based economy. Second, the untouchable and indeterminable IP’s of not physical nature. Those assets are called intangibles, whereby a distinction is made between identifiable and unidentifiable intangibles. Examples for identifiable intangibles are patents, copyrights, trademarks, patents and trade secrets. Unidentifiable intangibles include rather the know-how of employees, the human capital, the quality of the management team, the distribution network, the technical skills and corporate culture. Unidentifiable IP is strongly linked to IC, to human intellectual skills. (See figure 2)

Those abilities are indefinite assets, as they stay as long as the company continues operations. Human relationship or other forms of human capital like knowledge that gets captured and institutionalized in an organization is also considered as intangibles.

Figure 2: From IP to IC

² Cf : <http://www.wort.lu/en/business/intellectual-property-have-you-got-a-strategy-4f549a5ae401a0c200ca076277072014>

³ Cf : Zamboni, S., Marzo, G., Visualising Intangibles: Measuring and Reporting in the Knowledge Economy p 3



Source: IP Valuation, exploitation and finance, Pwc

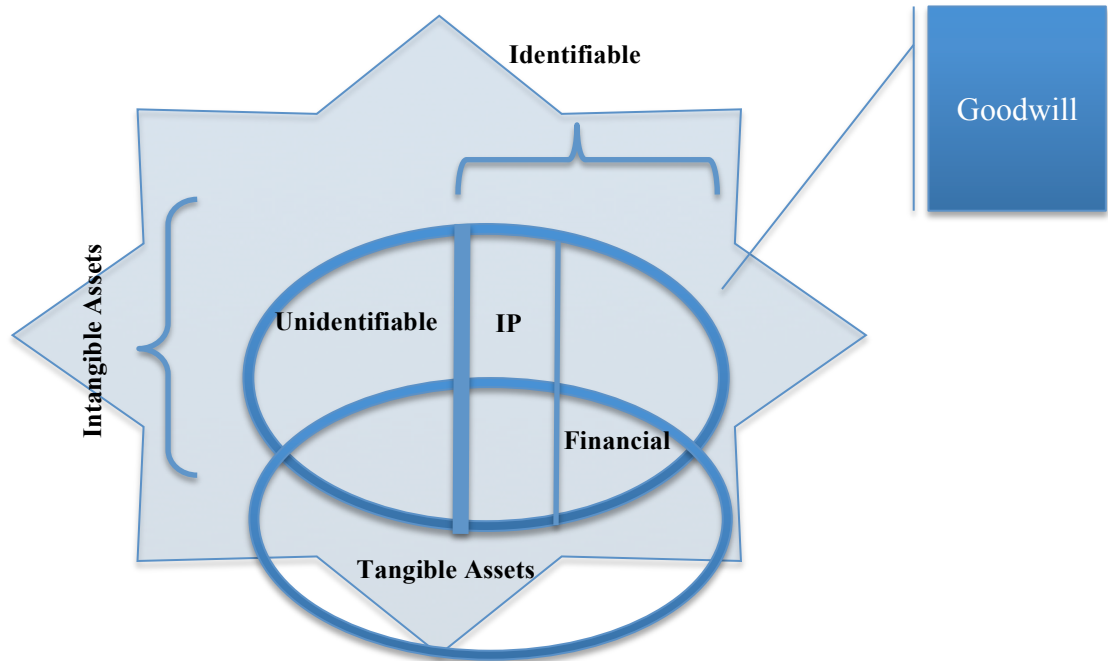
During the last years, immaterial assets are getting more and more important in a fast developing knowledge based economic environment. This statement is confirmed by recent surveys, reporting that intangible assets comprise, on average, more than 70% of companies' value.⁴ In fact, the shift to the knowledge era has already occurred across our economy. Today, competitive advantage is about what you know and can and no more about what you own. Fix assets are becoming more and more replaceable without generating any added value. Therefore knowledge becomes a new status in an organization or business and an asset that no one can afford to ignore.

To use IP or IC in an optimal way, the need of a good business model that surround them is necessary. However, if the core business of a company is IP, its highest value of IP or IC are not to consider as stand-alone assets but, rather, as an integral part of a successful business model.

The concept of goodwill is not specifically identified as a separate intangible asset or piece of intellectual property. It can be described as the value of an entity's image or reputation. This image or reputation can also be called the corporate identity umbrella brand, flagship brand, or marketplace advantage. (See figure 3)

Figure 3: Assets of a company

⁴ Cf: S&P 500 Market Value



Source: Own draft

One of the most important differences between intangibles and any other forms of property is that it cannot be defined or identified by its own physical parameters. To be protectable, stay valuable and fundable, IP or IC has in consequence to be expressed in a discernible way.⁵

Tangible assets are often coupled to intangibles. For this reason, there is an overlap between companies with tangible and intangible assets, for example patents associated with durable goods. The financial assets can also be considered as intangible asset, although sometimes, physical assets securitize them.

2.1.1 Tangible Asset

A tangible asset has a physical presence and includes both fixed assets, such as machinery, buildings, land, and current assets such as inventory. Often, intangible assets have been made for specific functions or have the ability to produce physical goods.

Natural resources like gold, oil, natural gas or even cereals and wheat are other examples for tangible assets. Those marketable items, produced to satisfy wants or needs, are called commodities. They are of homogeneous nature and can be bought and sold on a special market price. Financial assets can be claimed on tangible assets that impose a corporate structure, a legal corporate entity assigning roles and responsibilities

⁵ Cf: Chaplinsky, S., Methods of Intellectual Property Valuation, University of Virginia Darden School Foundation, Charlottesville, Rev 5/03

of individuals over the tangible assets. These financial assets can be traded in parallel with their underlying real asset. For example, gold mine shares are traded along with their product gold. But financial assets can also be claimed on intangible assets, like for example brandings, IP or ideas of a corporation. The stock value of the corporation consists in the value of the intangible assets.⁶

2.1.2 Identifiable Intangibles

Identifiable intangibles like IP can be classified very close to real and personal property, which are under protection of law or have a legal recognition. In consequence, these assets are traded on an adapted market. It is also possible to sell or gratuitously give away IP assets such as an ordinary tangible asset. Nowadays, purchasing or selling patents, licences and trademarks are as common as selling or buying food or banking products.

The patent is one of the most common known and identifiable types of IP. To be patentable, an invention in Europe is obligated to belong to a specific technological field and satisfy multiples criteria like: be novel, involve an inventive step, unique, useful, nonobvious and susceptible for an industrial application.⁷ By respecting all these obligations, you can easily recognize an IP asset. Nevertheless, legal status does not guarantee that the economic benefit, associated with some particular intangible assets, such as patent, will not be revoke.

Besides the patents it exists other well know categories of protectable IP assets like for example copyrights, software and database rights, tools like domain names as well as confidentiality and secrecy.

During the last years, IP has become a frequently traded asset. In particular, patents and copyrights are often purchased or assigned to another person than the original inventor or creator. For example, Michael Jackson was the owner of most of the Beatles' publishing catalogue.⁸

2.1.3 Unidentifiable Intangibles

In addition to the IP that is under protection of law, it exists also intangibles that are

⁶ Cf : Ho, T., Lee, S., The Oxford Guide to Financial Modeling: Applications for Capital Markets, Corportae Finance, risk Management, and Financial Institutions, p.17

⁷ Cf : Kihn, P., Laidebeur, O., David, B., Bill, J-P, Intellectual Property in Luxembourg, p.15

⁸ Cf : Cohen, A., Intangible Assets: Valuation and Economic Benefit p. 20 ff

created by the business process or their employees itself. These unidentifiable intangibles named intellectual capital (IC) consist for example of an assembled and well-trained workforce, advertising programs, distributor networks, training materials, customer loyalties, supplier contacts, goodwill, etc.... Normally these unidentifiable intangibles are assets that remain hidden, at least in the accounting sense, until a transaction like the acquisition gives rise to their identification. In general, these intangibles are not taken into consideration during the corporate valuation or they get often completely undervalued by the managers.

However HC, OC, and InfC contribute significantly to the earning power of an enterprise and are an important growth and developmental factor for companies and in particular for SME's because such companies are often characterized by the skill and motivation of their staff. Companies, where intellectual capital represents probably the only asset of significant value, are reliant on their workforce, processes or customer base. Their success is dependent on the know-how and knowledge of their employees.

Advantages of such intangibles are first the ability to provide entry barriers for direct competition. Moreover, they differentiate products and even the value of commodities. Durability and vitalisation new geographic or product markets are further advantages of unidentified intangibles. The three major nexuses of intangibles are discovery, organizational practices, and human resources.⁹

To summarize, intangibles are nonphysical sources of value (claims to future benefits), generated by innovation (discovery), unique organizational design, or human resource practice. Intangibles often interact with tangible and financial assets to create corporate value and economic growth.¹⁰

In a very simplified schema, the calculation of the value of an intangible assets based company could be as followed: The value of identifiable (IP) and unidentifiable (IC) intangibles + the value of the fix assets = corporate value.

2.2 The Luxembourgish economy, a progress through innovation

Luxembourg economy's lifeblood is the income from small and medium sized enterprises (SME). According to a survey of the European Commission, Luxembourg's

⁹ Cf : WIPO Workshop on Effective Intellectual Property Assets Management By SMES's, IP Valuation, exploitation and finance, Tony Hadjiloucas, Pwc

¹⁰ Cf : Lev, B., Intangibles : Management, Measurement, and Reporting, p. 7

SME's generated in 2012 about 72% of the value of the commercial economy and employed about 70% of the workforce of the Luxembourgish economy.¹¹ (See figure 4)

Figure 4: SME's in Luxembourg – Basic Information

	Number of Companies			Number of employees			Value creation		
	Luxembourg		EU27	Luxembourg		EU27	Luxembourg		EU27
	Number	Quantity	Quantity	Number	Quantity	Quantity	Mrd. EUR	Quantity	Quantity
Micro-enterprises (< 10)	25.854	87,9%	92,1%	49.367	21,3%	28,7%	5	26,4%	21,1%
Small businesses (< 50)	2.877	9,8%	6,6%	58.286	25,2%	20,4%	3	19,4%	18,3%
Medium-sized enterprises (< 250)	548	1,9%	1,1%	55.036	23,8%	17,3%	5	26,2%	18,3%
SME	29.278	99,6%	99,89%	162.690	70,3%	66,5%	13	72,0%	57,6%
Large enterprises (>250)	130	0,4%	0,2%	68.692	29,7%	33,5%	5	28,0%	42,4%
Total	29.409	100%	100%	231.382	100%	100%	18	100%	100%

Source: Own drafting based on European Commission, SBA-Datenblatt 2013

Due to the difficult economic conditions of the last years, many SME's have reduced their investments in fixed or physical assets and, in turn, invested in intangibles assets. This was not exclusively the case for young and High-Tec driven start-ups, but also for long-established SME's from different business sectors. They changed their attitude and invested more in their intangible capabilities like employees training, business strategies or research and development programs. R&D takes on an essential character in a small but very open economy. According to the Luxembourgish government, the structural specificities such the size, the industrial history and the prevalence of services as well as the presence of very small companies are the prerequisites to become an innovation hub.

Conscious of the medium and long term positive impact of R&D investments on the economic development and competitiveness, the Luxemburgish government has set a national R&D target in the 2.3-2.6% of GDP range, while seeking to maximize effectiveness of expenditures and taking into account the nation's absorption capacity. As a sub-objective for 2020, the government has set an interval of between 1.5% and 1.9% for the private sector and 0.7% to 0.8% in the public sector.

The government's intermediate objective is an overall rate of 2% by 2015.¹² (See figure 5)

Figure 5: Changes in the State's R&D budget and internal R&D expenditures

¹¹ Cf : European Commission, SBA-Datenblatt 2013-Luxembourg, p.2

¹² Cf : Luxembourg 2020, National Reform Program for the Grand Duchy of Luxembourg under the European 2020 Strategy p.25

	2006	2007	2008	2009	2010	2011	2012*	2013*	2014*
Mn €	113.8	142.6	183.1	200.2	247.7	253.4	280.0	296.0	310.0
% GDP	0.35	0.41	0.46	0.53	0.60	0.58	0.60	0.60	0.59
Changes in internal R&D expenditures									
	Public research € Mn.	Intensity (€ / GDP)	Private research € Mn.	Intensity (€ / GDP)	Total € Mn.	Total (€/GDP)			
2006	78.5	0.23	485.0	1.42	563.5	1.65			
2007	96.6	0.26	495.0	1.32	591.6	1.58			
2008	118.0	0.30	482.0	1.22	600.0	1.52			
2009*	166.2	0.44	468.4	1.24	634.6	1.68			
2010*	200.0	0.48							
2011*	215.0	0.49							
2012*	240.0	0.51							
2013*	255.0	0.52							
2014*	270.0	0.51							

Source: Ministry of Higher Education and Research Luxembourg Note: * estimated

According to the global innovation index, Luxembourg is rated on rank 12 out of 142 countries, participating to the study. Strengths of Luxembourg as an innovative business place consist in political stability, press freedom, education of the human capital, IT access and use, creative outputs (e.g. intangible assets) and online creativity. Cost of redundancy, royalty & license fees payments, computer & info services exports and the ease of protecting investors are according to global innovation index weak points of Luxembourg.¹³ However, a very important negative point of the innovative Luxembourg is missing in the survey of the global innovation index 2013. The ease of getting credit or loan for innovative or intangible based companies is not considered in the study. According to that point, the innovation index has some vulnerability.

2.2.1 Government, an engine for R&D

Regarding the national public research target, the Higher Committee for Research and Innovation in cooperation with the scientific, economic and civil society circles assist the government in preparing their actions. The main cooperation's are:

- The funding contract for 2010-2013 with the university of Luxembourg
- The 2011-2013 performance contracts with the public research centres for Health, Gabriel Lippmann, Henri Tudor, the CEPS, the National Research Fund (FNR) and Luxinnovation.
- The FNR's CORE program for 2008-2013, which supported a limited number of priority domains projects¹⁴ amounting to € 18.0 million over the period of 2008-

¹³ Cf : The Global Innovation Index 2013, The local Dynamics of Innovation p.205

¹⁴ Development and performance of financial systems; Higher quality and more productive business services; Information security and fiduciary management; High performance telecommunications networks, an essential innovation driver in the services sector; Sustainable management of water resources; Intelligent and functional materials and surfaces; Control of chronic, degenerative and infectious diseases; Challenges for the educational system, labour market, social protection, including

2010 and additional € 57.3 million from 2011 to 2013.

- The ATTRACT and PEARL¹⁵ programs of the FNR, which seek to encourage young researchers and top researchers to come to Luxembourg to work. Costs of € 3.8 million for the period 2008-2010 and additional € 13.7 million for the period 2011-2013 are intended.

By this way, the government tries to intensify synergies between various innovative companies, reinforce participation in the EU Framework Program for Research and encourage the development of genuine skill centres. From this perspective, the government wants to improve public research results by supporting an intellectual property policy within public research facilities and also back start-ups and spin-offs within host structures for young innovative companies.¹⁶ These incentives consist mainly in the investment of tax money with the intention that these funds also reflow into Luxembourg's economy. However, there are no guarantees that companies, which have touched these financial supports to finance their R&D, are becoming sedentary in Luxembourg.

2.2.2 Private sector, an engine for R&D

With the regard to achieve the national targets in the area of private research, the government has decided to offer additional financial support for Research-Development-Innovation (RDI) in the private sector. The law from the 5 June 2009 to promote RDI in the private sector provides specific state aid schemes that emphasize national priorities:

- Incentives for new and sustainable processes for SME that have not yet exploited their potential for innovation.

These aid schemes are exclusively reserved for SME's that cover external expertise, protection of intellectual property consecutive to an R&D project and temporary hosting of highly qualified personnel seconded from large corporations or public research organizations.

- The development of collaborative research among companies of all sizes and

the territorial aspects; Identities, diversity and integration.

¹⁵ Cf : <http://www.fnr.lu/var/fnr/storage/original/application/076d9d900418593ed8d691e35acfaa8e.pdf>
01/10/2014

¹⁶ Cf : Luxembourg 2020, National Reform Program for the Grand Duchy of Luxembourg under the European 2020 Strategy p.25-27

public research organizations, both domestically and internationally. In order to achieve this objective, R&D and feasibility study aid schemes include extensions of aid for projects and programs meeting these criteria.

- Setting up new innovative companies with less than six years of operations and a R&D expenditures of least 15% of the operating expenses, or companies that are developing products, processes, services, methodologies and organizations well in advance of current European technology.
- Implementation of special action plans to benefit logistics, health technologies and eco- technologies.

The government supported 240 programs and projects with these types of aid over the period 2011-2013, compared to 143 registered over the period of 2008 - 2010. According to statistics of the Luxembourgish government, the annual budget provisions forecasted a need of a budget increase for R&D of € 46 million in 2011 compared to € 65 million in 2013 to realizes all planed projects.¹⁷

The author regrets that most of the public-private partnerships in the R&D process are combinations with big players on the Luxembourgish market. For example, Goodyear addresses its long-term challenges with the help of the FNR's core program, Circuit Foil develops new products with the support of the ministry of the economy and foreign trade, Telindus benefits from academic knowledge through the FNR's AFR grant scheme. In the research field, only few micro-businesses like for example J-Way, which creates sophisticated online forms for PCs and smart phones, profit from these public benefits.¹⁸ Nevertheless, the aim should be to achieve the common goal of establishing an innovation hub. Why not working closely together and abstain form the strict separation of public and private research. Even if there are already synergies on the R&D field, there is still too much separation between public and private.

2.2.3 The innovative ability of Luxembourg

Beside the governmental efforts on R&D investments, Luxemburg promotes himself as an innovation hub in the centre of Europe. To provide this innovation centre, the Luxembourgish government launched in 2002 a program called Cluster Initiative with

¹⁷ Cf : Luxembourg 2020, National Reform Program for the Grand Duchy of Luxembourg under the European 2020 Strategy p.28-29

¹⁸ Cf : Fond national de la recherche, Boost your competitiveness with public knowledge, Funding opportunities For public-private partnerships, 2011

the aim to create synergies between research as well as business-based structures for innovative companies and institutions. To enhance the efficiency of this process, the idea is to develop a Cluster for each business sector. These clusters are: Biohealth, EcoInnovation, Materials, InfoCom and Space.¹⁹

To attract foreign innovative companies, a full range of tailor made business forms and incentives are offered to those companies in order to set up their business in Luxembourg. One major incentive, but also internationally the most discussed, is the Luxemburgish tax regime. It was adopted in 2007 and allows companies an 80% exemption for net income derived from certain IP rights and capital gains realised on the sale of IP. (Circular L.I.R. n°50bis of 5 March 2009).²⁰ In other words, the effective average tax rate on IP income is 5,7 %. The scheme covers patents, trademarks, designs, domain names and software copyrights and is applied on companies located in Luxembourg.²¹

Nevertheless, since the investigation of the EU against Luxembourg's tax arrangements with Amazon on the 7th of October 2014, these tax incentives became more and more in discredit. Amazon is structured so that all online sales in Europe are technically between customers and a Luxembourg company. Despite racking up almost 14 billion euros of sales each year, Amazon's main European subsidiary, Amazon EU Sarl, reports almost no profit. That is, at least partly because it pays hefty fees to its immediate parent Amazon Europe Holding Technologies SCS, a tax exempt partnership, in return for using Amazon intellectual property.²²

In addition to a favourable tax regulation, Luxembourg's government has also voted a wide range of direct state aid incentives. (See figure 6)

R&D is one of the most important innovation process, which is strategically vital for the current and future profits of Luxemburgish companies. However, basing an economic development only on tax regulation and incentives foreshadows a slightly haphazard of the Luxemburgish government.

¹⁹ Cf : <http://www.clusters.lu/> 23/07/2014

²⁰ Cf : Kihn, P., Laidebeur, O., David, B., Bill, J-P, Intellectual Property in Luxembourg, p.114

²¹ Cf : <http://www.luxembourg.public.lu/en/invest-luxembourg/intellectual-property/index.html> 9/6/2014

²² Cf : <http://www.reuters.com/article/2014/10/07/us-eu-amazon-com-tax-idUSKCN0HW0PP201410077/10/2914>

Figure 6: State aid for research development and Innovation in Luxembourg

		Maximum Intensity / Maximum Amount		
Type of scheme		Large enterprise or private research organisation	Medium-sized enterprise or private research organisation	Small enterprise or private research organisation
R&D project or programme	Experimental development*	25% (40%)	35% (50%)	45% (60%)
	Industrial research*	50% (65%)	60% (75%)	70% (80%)
	Fundamental research	100%	100%	100%
Technical feasibility studies	Prior to experimental research	40%	50%	50%
	Prior to industrial research	65%	75%	75%
Protection of technical industrial property	Following experimental development*	n/a**	25% (40%)	25% (40%)
	Following industrial development*	n/a**	50% (65%)	50% (65%)
	Following fundamental research	n/a**	100%	100%
Aid for young innovative enterprises		n/a	n/a	€ 1,000,000
Innovation advisory services and innovation support services		n/a**	€ 200,000 maximum aid per 3-year period	€ 200,000 maximum aid per 3-year period
Temporary secondment of highly qualified personnel		n/a**	50%	50%
Investment in innovation Clusters		15%	25%	35%
Animation of innovation Clusters		50% on average, over a maximum period of 5 years		
"De minimis" measures		€ 200,000 maximum per period of 3 fiscal years		

Source: PwC, Your access to European markets, Luxembourg: Where else?

From the perspective of state support, Luxembourg seems to be an excellent area for innovative companies. However, this changes when companies analyse the private financing options for such innovative businesses. To start and run a business, the need of initial capital and cash is primordial. Besides the state aid programs, companies are faced to the problem of financing their business idea. In Luxembourg, getting bank loans are almost impossible for innovative, intangible driven companies that have no real fix financial collaterals. Banks wants not only limiting their risk, but they have also to respect the obligations and regulations from the CSSF. This obligation goes back to BASEL III that gives the instruction to refuse credits to companies without sufficient own funds and securities.

Even if intangible rich businesses are more resilient and perform better that other over time. However the IP and IC, which equity investors value high are rarely or not considered in mainstream lending practice.²³ Normally banks consider the companies' cash flow and tangible assets as the most important weighting factor in traditional debt finance. Nonetheless, innovative and intangible based businesses are closely related to IP or IC assets that are until now not taken into consideration in the calculation of business collaterals.

²³ Cf : Brassel, M., King, K., Intellectual Property Office, Banking on IP? , Newport 2013 p.2

2.3 IP and IC, the most important values for innovative companies

Intangibles and intangible assets compose the value of an innovative business.

According to the business dictionary, intangible assets are the long-term resources of an entity with no physical existence. They derive their value from intellectual or legal rights and from the value they add to the other assets. Intangible assets are generally classified into two broad categories: “Limited-life intangible assets, such as patents, copyrights, goodwill etc.... and unlimited-life intangible assets, such as trademarks.”²⁴

In addition to this definition, another important worth factor of intangibles is the value from the brainpower of a company, which consist of the knowledge of the workforces, the management skills or relationships and corporate culture.

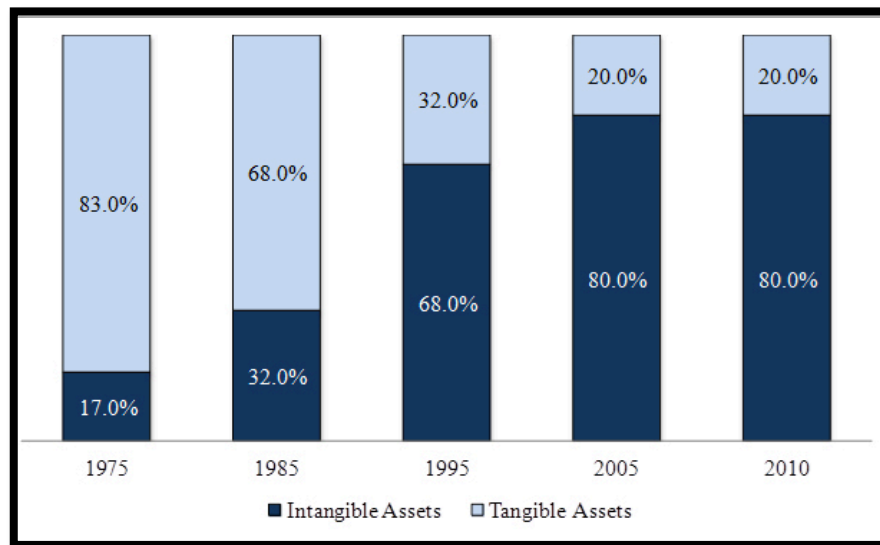
IP assets and intangibles could act in an implicit or explicit way. It is something that can be stored in people’s heads or documented in written or electronic format.²⁵

Not only in Luxembourg, intangibles become an important growth and development factor. Within the last quarter century, the market value of the S&P 500 companies has significantly deviated from their book value. This "value gap" indicates that physical and financial accountable assets, reflected on a company's balance sheet, comprises less than 20% of the true value of the average firm. (See figure 7) The research about the components of S&P 500 companies shows that a significant portion of this intangible value is represented by patented technology.

Figure 7: Components of S&P 500 Market Value

²⁴ Cf : <http://www.businessdictionary.com/definition/intangible-asset.html> 30/08/2014

²⁵ Cf : <http://www.qfinance.com/dictionary/intellectual-capital> 30/08/2014



Source: Ocean Tomo, LLC

According to Michael D. Friedman: “The value of a corporation’s patents is a unique, forward-looking indicator of corporate value. The reason for this is intuitive. The most innovative companies, business with the strongest patent portfolios often outperform their peers as a result of Federal government granted exclusionary rights on the production of the patented product or service, proprietary market position, related economies of scale, premium pricing associated with unique features, and lower cost due to protected methods of manufacturing.”²⁶

For this reason being an innovator gives companies the possibility to determine the market and generate competitive advantages. In nowadays world, intangibles allow differentiating themselves from the competitors and generating a high market value.

Innovation has always been an important activity of individuals and businesses. The inventions of Thomas Edison or Alexander Graham Bell are historical examples. Their drive for innovation as well as the great scientific and industrial inventions on the field of electricity, chemistry and pharmaceuticals of the nineteenth and twentieth centuries gave the followers the incentive to innovate.

The historical intrinsic motivation to innovate of Thomas Edison and Graham Bell could today be completed by other strong incentives like the prospects of abnormal profits or monopoly rents, protected for a certain period by patents or the “first-mover advantage.” In today’s world, where the decreasing economies of scale from production are coupled to the ever-increasing competitive pressure, the innovation has become a

²⁶ Cf : <http://www.oceantomo.com/media/newsreleases/Intangible-Asset-Market-Value-Study-Release>
7/08/2014

guarantee or insurance of corporate survival.²⁷

Intangibles are often the result of innovation. So by doing investments in innovation, the creation of intangibles is animated and active. When such intangibles become commercially successful, they can be transformed into commercially “tangible assets” creating corporate value and growth. To secure the first mover advantage, patents or trademarks can protect these intangible assets.²⁸ In contrast to those protectable IP assets, knowledge of employees, reputations of the company, goodwill etc. are unfortunately not protectable.

2.4 IP and IC as key policy for a knowledge economy

Over the last years, the governments have recognized that not all elements of a company wealth have a physical nature, leading to the difficulties of evaluating the real wealth and value of such an organisation. This has become one of the major challenges for the government for the next years with the progress of the knowledge-driven economy.

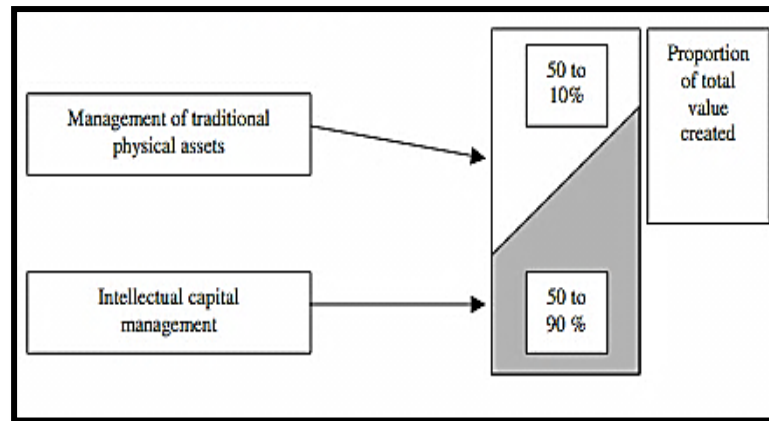
Assets such as human capital, know how, clientele and reputation, trademark, brands, training, supplier network etc., are increasing enormously the company value and become the most important factor in the competitiveness of many companies or business sector. Recent estimates suggest that 50–90 per cent of the value created by a firm comes not from management of traditional physical assets, but from the management of intellectual capital.²⁹ (See figure 8)

Figure 8: Value Created by the Company

²⁷ Cf : Lev, B., Intangibles : Management, Measurement, and Reporting, p. 14

²⁸ Cf : Lev, B., Intangibles : Management, Measurement, and Reporting p.16

²⁹ Cf : Hope, J., Hope, T., Competing in the third wave p.134



Source: Hope, J., Hope, T., Competing in the third wave

While the knowledge-driven economy is in a plain emerging stage, the understanding about the real financial value of that “knowledge economy” is unfortunately not developing till today. This phenomenon is due to the fact that financial accounting methods and official statistics are still heavily based on a pattern dominated by tangible assets.

Nevertheless, the interest in the values of IP and IC is noticeable growing since a few years. Investors, companies’ managers, shareholders, venture capitalists, national institutes, auditors, consultants, securities regulators and banks have noticed that those assets have an enormous financial potential. Accordingly, many countries have launched policies regarding intangible issues.

This is often a reorganization of public regional development funding from hardware, hard infrastructure to softer infrastructure and environmental measures, as well as the provision of intangible resources. Most economic policies encourage intangible investments on employee training or process optimisation to ensure the protection of intangible assets like patents or brands and thus favouring the development of innovation networks.

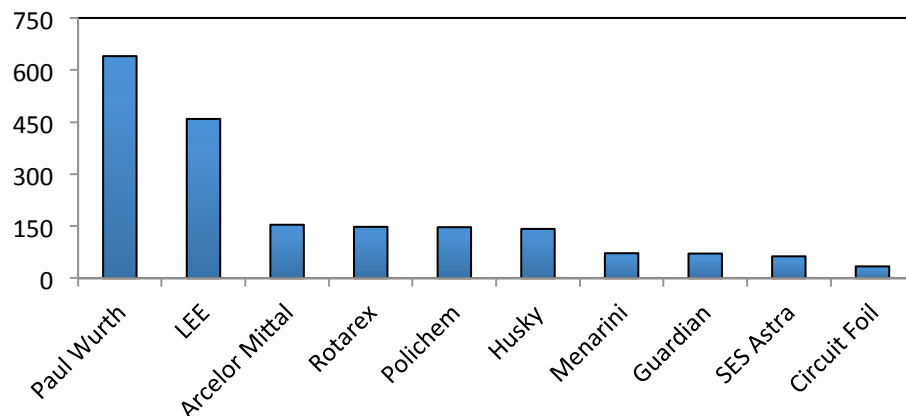
For example Denmark, Sweden and Netherlands have demonstrated sustained interest for intangible assets as an umbrella concept. The United Kingdom presents an emerging agenda concerning an integrated approach to intangible assets. France, Italy and Germany have an interest for addressing innovation, knowledge and human capital as key components of any policy.³⁰

To underline their willingness to strengthen the IP and intangibles strategy of Luxembourg, the government has recently launched an Institute for IP called the

³⁰ Cf : <http://www.ll-a.fr/intangibles/overview.htm> 19/10/2014

“Institut de la Propriété Intellectuelle Luxembourg” (IPIL). The institute’s goal is to unite national and international expertise on intellectual property and to deal in particular with the topics of identification, security, protection and exploitation.³¹ (See figure 9) It is regrettable that the government leave out the problematic of IP and intangible evaluation and funding as one of the main tasks for the IPIL.

Figure 9: Top 10 of Luxembourg’s Patent holder



Source: Own draft, based on Journal 18/19 August 2012 N° 159

Intangibles will become a key element of national policy to promote Luxembourg as paradise for innovative companies. To foster the development of intellectual property for the purposes of the Luxembourg economy, the institute will have the following tasks: coordinating the implementation of public policy and unite the actors involved; develop and provide support services and assistance to businesses, research stakeholders, public institutions and other interested public; develop and provide training and promotional activities and awareness; conduct projects and studies to advise the government.³²

These ideas sound promising, however the fact that Luxembourg’s politicians have already worked several years on the project of intangible assets with only moderate success raise questions about the usefulness of the measures.

It is non-sense to launch working groups or public innovation institutes without a later link to the real economy. Luxembourg needs a strong linkage between politics, private and public investors and innovators, private and public researchers and local financial

³¹ Cf : <http://www.gouvernement.lu/3891246/01-conseil-gouvernement?context=519177> 19/10/2014

³² Cf : <http://www.gouvernement.lu/3891246/01-conseil-gouvernement> 19/10/2014

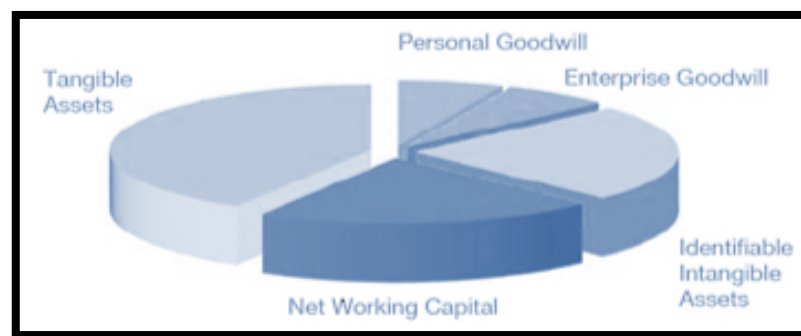
institutes to implement IP and intangibles on the Luxembourgish economy.

3 The valuation of IP and IC

3.1 The importance of IP and IC

Valuation is the action of estimating or fixing the monetary or other value on something. Calculating the value of an IP asset is usually not a major problem while they have been formally protected through trademarks, patents or copyright that are tradable on a non-regulated market. The situation is changing when intangibles are represented by states or feelings like: know how, customer loyalty, knowledge, workforce training systems and methods, technical processes, customer lists, distribution networks or goodwill. (See figure 10) These “IC assets” may be similarly valuable but more difficult to identify in terms of the earnings and profits they generate. An initial due diligence analysis of intangibles comes very fast to its limits when using a traditional valuation approach. Consequently, the need of an alternative approach is evident.

Figure 10: Components of Enterprise Value



Source: <http://www.srr.com/article/what-creates-personal-goodwill> 19/09/2014

The analysis of the components of an enterprise value shows that in today's companies, tangible assets represents often less than 40% with a downward trend. The rest of the corporate value consists of: net working capital, personal and enterprise goodwill and a significant part consist of identifiable and unidentifiable intangible assets. That is the reason why the valuation and the protection of those intangibles are essential. Bringing together the economic concept of intangible value and the legal concept of property create a competitive advantage for companies.

Nevertheless, the valuation of IP, goodwill and intangibles is totally different to the traditional tangible or fix assets valuation. The most important dissimilarities are:³³

- The constraints and conditions when valuing IP and IC are pretty different from those in a tangible asset valuation situation because IP and further IC are more difficult to capture.
- IP and IC asset valuations are more subject and influenced to outside environment issues and pressures.
- The context is critical in valuing IP and intangibles
- Often the IP and IC assets are difficult to categorize, identify, and separate from each other.
- IC and IP valuations are much more suggestible by the subjective judgment and relative experience of the valuation professional.
- There exist no historical experience in IP and IC valuation
- Intangibles could be volatile components in the economic value of a company. Nevertheless, in IP and IC driven companies, those components could represent almost the complete value of such a business.

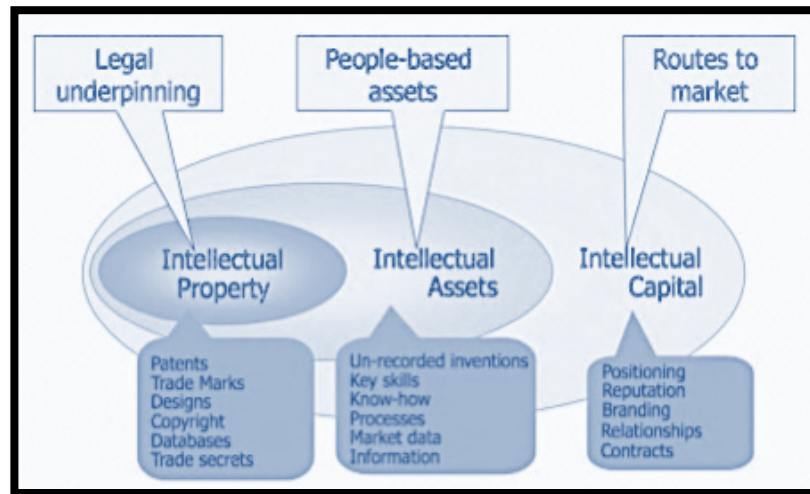
The fundamental dissimilarities of the valuation methods of intangibles and tangibles confirm a manifest need for a different valuation method.

A critical aspect of the valuation process is the identification and elaboration of an appropriate methodology to measure the economic value of such, till now unknown intangible assets. The relative emphasis of each method often varies with factors such as the stage of development of the IP driven business or asset, feasibility of the IP asset, adequacy of comparable transactions in the market or the utility of the IP and IC from enhanced legal protection. However, the choice of an appropriate measurement method for valuing intangibles is not the only challenge. The valuation professional must try to crosscheck the results from one approach to another. Testing the worth of sensitivities to the output of a business that is based on various inputs is a crucial step in valuation of IP and IC.³⁴ (See figure 11)

Figure 11: Elements of Intellectual Capital

³³ Cf : Ahya, C., Intellectual Property Valuation, p. 28-29

³⁴ Cf : <http://www.lawgazette.com.sg/2014-04/1016.htm> 15/09/2014



Source: coller/ipmanagement 2009

However, by valuating a company that is based on intangibles, it isn't sufficient to evaluate only the worth of the individual IP assets such as trademarks or patents. The valuator has to evaluate the whole intellectual capital portfolio, from IP to IC. The innovative business has to be evaluated as a whole unit with all intangibles.

3.2 Traditional valuation approaches

Traditional acceptable methods for the valuation of intangibles fall into three broad categories. They are market based, cost based or based on estimates of past and future economic benefits also called income approach.³⁵ Under ideal conditions an expert or valuator will always prefer to determine a market value by reference to comparable market transactions. This is already highly delicate when estimating the value of a common tangible asset such as, houses or cars. According to IP and IC, this valuation is exacerbating because it isn't possible to find a transaction that is exactly comparable.

By valuing an IP or IC, the search for a comparable market transaction becomes almost impossible. This is not only due to lack of compatibility, but also because IP and IC are generally not developed to be sold. The IP assets that are trade on the market often represent only a small part of a larger transaction and details are kept extremely confidential. There are also other disablements that limit the effectiveness of these traditional methods like, special purchasers, different negotiating skills and the

³⁵ Cf : <http://www.lawgazette.com.sg/2014-04/1016.htm> 01/09/2014

distorting effects of the peaks and troughs of economic cycles.

3.2.1 The market method

The market method is based on the comparison of an intangible asset with the actual price paid for a similar IP or other intangible assets under similar circumstances.³⁶ The market transaction method is used to estimate the fair value of an asset by reference to the transaction prices or valuation multiples implicit in the transaction prices of identical or similar assets in the market. The problem of this method is that it is usually difficult to find comparable transactions. Since IP is unique to a particular business entity and IC represents no concrete asset, comparison between entities are difficult or even impossible.

3.2.2 The cost approach

The cost approach is based on the costs to obtain a patented development either by internal development or by external purchase. All cost-based valuation methods are founded on the principle of substitution. Replacement cost represents what it would cost today to buy a substitute intangible asset of comparable utility under the condition that the same asset is available on the market. The cost of the new substitute intangible asset should be adjusted for obsolescence factors in order to make the hypothetical new intangible asset comparable to the subject intangible asset. It is usually inappropriate to use the cost approach as it fails to capture the future earnings potential of the IP and IC asset. This approach is potentially used as a crosscheck tool or as a rational decision-making model, assisting in buying decisions for IP assets with a relatively short history.

Another flaw of the cost method consist therein that the cost approach does not account the wasted costs that incur during an R&D phase. For example, pharmaceutical research projects often result in no benefit because of they wasted amounts of sums. It does not consider the unique and novel characteristics of IP.

Therefore, it usually does not incorporate the expected economic benefits or the income

³⁶ Cf :

http://www.wipo.int/export/sites/www/sme/en/documents/pdf/ip_panorama_11_learning_points.pdf
11/10/2014

generating potential of the IP asset.³⁷

3.2.3 The income approach

The income approach values the IP asset on the basis of the amount of economic income that the IP or intangible asset is expected to generate, adjusted to its present day value. Different measures of economic income are relevant for the various income methods, including: Gross or net revenues, gross profit, net operating income, pre-tax income, net income after tax, operating cash flow, net cash flow, etc.

An essential element in the application of the income method is to ensure that the applied discount or the capitalization rate is derived on a consistent basis with the measure of economic income.³⁸

The greatest challenges to any income method are the estimations of revenues, to fix a realistic discount rate and to define a reasonable life cycle of intangibles and IP assets. Longevity of IP is largely dependent on various factors such as technological obsolescence, attrition in revenue, product life cycle, ability of the IP to adapt to changing market conditions, etc. These factors are often not subjective, and the experience of valuation specialists will be required to assess such inputs.

One of the key aspects to be aware of the comparability of licensing transactions is to estimate the royalty rate. The valuator should also be able to compare and contrast the profitability and growth factors between the subject IP and the IP being used to benchmark the royalty rates. Some transactions also have upfront and milestone payments along with royalty payment; such nuances must be considered before arriving at the comparable royalty rate applicable to the subject IP.³⁹

It is useful to have several valuation methodologies in a toolbox to provide a rational basis for determining reasonable pricing. Nevertheless IC is rarely considered in traditional valuation methods. So the time for alternative valuation approaches has arrived.

³⁷ Cf :

http://www.wipo.int/export/sites/www/sme/en/documents/pdf/ip_panorama_11_learning_points.pdf
11/10/2014

³⁸ Cf : Contractor, J., Valuation of intangible assets in global operations, p.191-192

³⁹ Cf : <http://www.lawgazette.com.sg/2014-04/1016.htm> 27/09/2014

3.3 A knowledge economy needs alternative valuation methods

Evaluating huge companies or corporations like retailers, banks, insurance companies, which publishes financial reports and annual financial statements, is quite standardized. Generalizations about the valuation process for intangibles-intensive companies are unfortunately not possible for two reasons.

First, IP have to be unique. Brands, patents or trademarks generate an income only if it has a unique status. For instance, a successful clinical trial at Pfizer does not furnish any information about what's going on inside Merck or Novartis. Therefore, a patent has to be unique and protected. Moreover, intangible assets, unlike many physical and financial assets, are not traded in active and transparent markets.⁴⁰

Second, the value of IC normally appears only fragmentarily on the balance sheet of a company. However, intangibles stay generally hidden in the so called "goodwill/intangible bucket". As IP and IC are, by its nature, innovative and therefore different, each case for valuation requires investigation. It isn't possible that the values of intangibles and IP are calculated automatically. Standardization of a valuation approach is hard conceivable. As a result, IP and intangibles valuation of company's assets consists of an opinion or estimation at a particular time point.⁴¹

Research elucidates that investors systematically misprice the shares of intangibles intensive enterprises. Sometimes, the market overvalues intangibles wildly for some dotcoms and wastes capital. For companies in established sectors, the reverse is more often the case: investors undervalue intangibles.

These burdens firms with an excessively high cost of capital, which in turn leads them to underinvest in intangibles, thereby squandering opportunities for the earnings and growth investors seek.⁴² (See figure 12)

⁴⁰ Cf : Lev, B., Sharping the Intangible Edge, Harvard Business Review, 2004 p.2

⁴¹ Cf : IP valuation Expert Group report 29-11-2013, Final Report p.10-11

⁴² Cf : Lev, B., Sharping the Intangible Edge, Harvard Business Review, 2004 p.2

Figure 12: Future Risk-Adjusted Stock Returns to R&D Capital-Intensive Companies



Source: 2002 Harvard Business School Publishing Corporation

An analysis of the stock price of R&D Capital-Intensive Companies shows us how investors frequently under-price the shares of intangibles-intensive enterprises by serious investments on R&D. The return on a portfolio of such companies increasingly outperforms the market on a risk-adjusted basis as time passes, suggesting that investors are slow to realize the full value of the R&D investments.⁴³

Certainly, the knowledge about the economic value of a company's intangibles can help investors to create and develop a strategic business decision. Apart from a strategic point of view, it exists many business situations where an evaluation is helpful, for example in an M&A deals, before a joint venture arrangement or as a help for turnaround managers in insolvency cases.

According to the actual economic situation, business managers have realized that IP and IC has become an important cash cow for companies. The protection of IP allows selling or licensing those assets. Therefore, the value of IP has becoming an important factor in assisting internal decision making, for accounting and taxation purposes or fund raising through business angels or venture capitalists.

IC on his side can make explode the economic growth of a company in a short time. (Example: Facebook, Twitter, Alibaba etc....)

⁴³ Cf : Lev, B., Sharping the Intangible Edge, Harvard Business Review, 2004 p.2

According to the author, the classical valuation methods like the cost-based, market-based or future income base approaches are inappropriate for a subjectivity-based economy. The classical methods don't take in consideration the whole company.

They are only based on costs, similar transactions or future profits or cash. They don't consider the corporate culture, the knowledge of the workforce or the goodwill of a company.

IP and IC are often unique assets that have to be valued in a particular way. Intangible assets are often not taken into account in the conventional methods. However, today, intangibles are becoming increasingly important for companies and their enterprise value. There exist already some ISO- or DIN- standards for the valuation of intangibles, but these are only guidelines.⁴⁴ For example the ISO 10668:2010 specifies requirements for procedures and methods of monetary brand value measurement. Moreover, ISO 10668:2010 specifies a framework for brand valuation, including objectives, bases of valuation, approaches to valuation, methods of valuation and sourcing of quality data and assumptions. It also specifies methods for reporting the results of such valuation.⁴⁵

As previously mentioned, these ISO or DIN norms only take in consideration a small part of the IP assets portfolio and don't even mention the IC assets like know how, skills or goodwill of a company. For this reason, these standards could only act as guideline on the development process of an alternative valuation approach of IP and IC.

3.4 An alternative perception of IP and IC

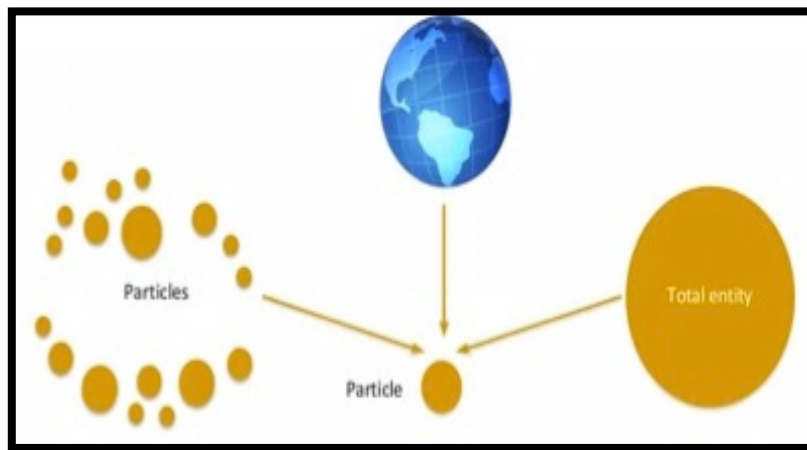
To value IP and IC, it is necessary to understand the function of these "assets" in a company. The function of an Atom explains the function of IP and IC in a business. In order to understand an Atom, it is elementary to understand first the particles. (see figure 13) To understand the particles, the environment and the interaction of the particles has to be understood, in order to understand the total entity.

Figure 13: From Particles to a total entity

⁴⁴ Cf : Meindl, C., WirtschaftsKurier März 2011, p.22

⁴⁵ Cf :

http://www.iso.org/iso/home/store/catalogue_ics/catalogue_detail_ics.htm?ics1=3&ics2=140&ics3=&csnumber=46032_27/09/2014



Source: Kneppelhout & Korthals Advocaten

The same model could be applied on IP and IC assets. To understand and value a company, you have first to identify the individual IP and IC assets. They have to be considered as high-risk “assets” equated to particles that could generate value to the company. Most of the time they can’t do that stand-alone. Therefore the understanding of the entire business and his environment as well as the basis, what’s happening in the world in connection with the main economic tendencies is a premise. Once the drill down analysis of the different IP and intangible assets is complete, the proper valuation can be accomplished.

The aim should be to combine the individual ratings to a whole, representative for the entire company. Consequently, the understanding of the entire company is also primordial.⁴⁶

According to the author, we have to stop believing in a fully deterministic IP and IC asset valuation model that can capture every single element of the valuation. Looking on the ultimate IP and intangibles valuation model makes no sense. Economy is emotion and is based on subjectivity. Therefore the valuation process also needs some emotional and subjectivity influence.

The classical approach of comparing past transactions, trading multiples and historical data is very risky because the valuation is based on indicators who are out-dated, probably leading to a wrong valuation. Today in a high tech, ultra fast moving world, we need an anticipative approach.

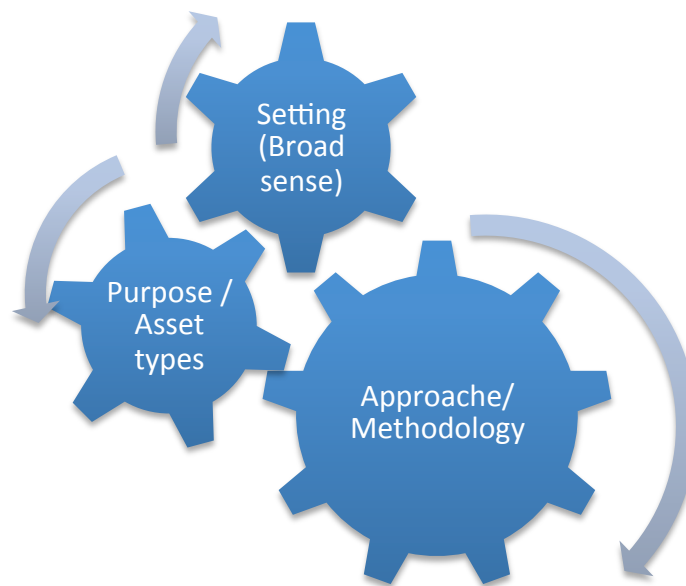
The valuation approach in this thesis is based on an economic reasoning. Every valuation is different, so it is important to built the frame of the valuation approach and

⁴⁶ Cf : IP valuation Expert Group report 29-11-2013, Final Report p.17

justify the arguments used. (see figure 14)

- **Setting:** Fix an approach and methodology of the valuation. It is the creation of a frame.
- **Approaches:** An existential factor of the valuation approach is the type of assets that has to be valuated. IP that is legally protectable or IC?
- **Asset types:** The purpose of the valuation. The parameters of a business valuation typically differ, depending on whether the valuation is being made for purpose of selling the property, fixing estate value, declaring taxable, etc.⁴⁷

Figure 14: Valuation Project



Source: Own Draft

3.5 Model of alternative intangible valuation

The classic valuation methods often reach their limits when corporate value

⁴⁷ Cf : Shippey, K., A short course in international property rights, p.22

incorporates intangibles. The fact that they only sparsely or even don't deal with IP and IC is based on the element that the comparable market data is frequently not available or doesn't exist. The uniqueness and singularity of these assets make the application of the classic valuation methods difficult, inaccurate and incorrect. All these methods are somewhat unsatisfactory, and usually factors have to be added to the calculations to account for the special circumstances.⁴⁸

Therefore the author has developed a valuation approach that is based on the three "asset" classes of a company. These three assets are:

- **Identifiable, tangible assets:** machinery, building, land...
- **Identifiable, intangible assets:** (IP and financial):
 - Patents, trademarks, copyrights, etc.
 - Cash, stocks, etc.
- **Unidentifiable, intangible assets: (HC, OC, InfC)**
 - Goodwill, corporate culture, reputation, etc.

According to the author, the valuation of the tangible assets is not treat in the thesis. However, the classical approaches are well suited to value these tangible asset categories.

Unlike the tangible assets, the identifiable and unidentifiable intangibles acquire their essential characteristics, from which value emanates. For IP- and IC-based businesses, these intangible assets are the elements, after working capital and fixed assets, which make the enterprise 'tick' and contribute to the enterprise's earning power. Their existence and in particularity their value are dependent on the presence or expectation of earnings. They appear last in the development of a business and disappear first on its demise.⁴⁹

The identifiable intangibles could be valued by a real or realistic market value. The fact that there exists the possibility to trade IP assets like Patents or Trademarks allows the valuator to fix a realistic market price for these assets. For IC, this trading

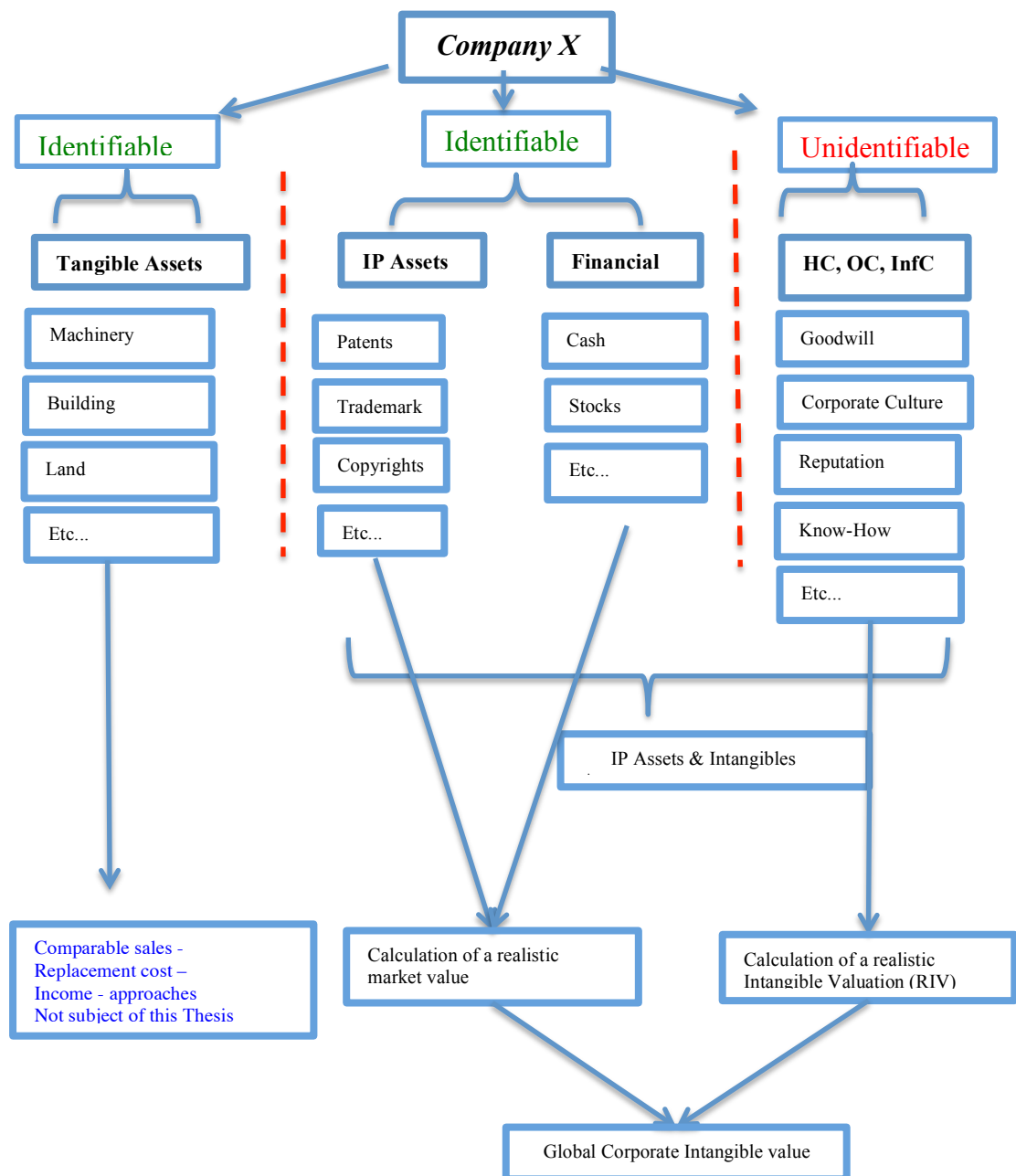
⁴⁸ Cf : Shippey, K., A short course in international property rights, p.23

⁴⁹ Cf : Zareer, P., Valuation of Intellectual Property Assets, PWC, p.4

opportunity is not given.

To fix a realistic market price, all influencing factors have to be taken into account. The method will be discussed in the following chapter. (see figure 15)

Figure 15: Alternative valuation model



Source: Own Draft

The valuation of the unidentifiable intangibles has more unknown factors and becomes thereby more complicated. To distinguish and value each different intangible that create added value to a business is quite problematic as these intangibles merge into each other.

A corporate culture has for example an influence on the staff. The employees on the other hand have an important influence on the work process. The work process on the other side has an impact on the output of a company. The output has an affect on the customer satisfactory, etc. In reality, the intangibles are influence by a host of external factors that makes the valuation even more complex and complicated. The aim of the valuation of the unidentifiable intangible should be to calculate by a realistic Intangible Valuation (RIV).

Bringing together these two approaches allows the analyst to give a global overview of the corporate value.

3.6 Methodology of the alternative intangible valuation

There is no objective “enterprise value” in practice. Entrepreneurs, who want to sell their business, consider the work that has been invested in the company as adding value to their business. However, the buyer mainly focuses the future earnings of the company and how to finance the purchase price. In consequence, both have different opinions regarding the purchase price leading to different price approaches for the same object.

The problems for companies that are driven by intangibles consist in finding a realistic market value. The valuation of something abstract and invisible together with physical elements that you can see, touch or feel is difficult to implement.

IP and IC assets issues abound throughout the business world, touching nearly all aspects of a company. From product development to human capital and staff functions such as legal, accounting, finance to line operations such as R&D, marketing and general management, intangibles and IP are existent.

This wide diversity of IP applications and stakeholders is a leading contributor to the complexity of managing and valuating IP and intangibles.⁵⁰

According to Kaplan and Norton, companies with a sound strategy based on IP and intangibles that are aligned with that strategy will create value for the organization.

If the assets are not aligned with the strategy or if the strategy is flawed, then intangible assets will create little value, even if large amounts have been spent on their

⁵⁰ Cf : Flignor, P., Orozco D., Intangible Asset & Intellectual Property Valuation : A Multidisciplinary Prospective, June 2006, ipthought.com p.1

development.⁵¹

Separate analysis of identifiable and unidentifiable intangibles allows calculating a realistic value of IP on one hand and of IC on the other hand. Every asset has its own particularities that have to be respected during the valuation. The aim is to create a valuation model that gives an accurate and complete overview of the value of a company, which leads to the possibilities of alternative funding possibilities.

3.6.1 Valuation of intellectual property (IP)

Regarding the evaluation of IP, the EU has already developed the model of the IPscore.⁵² This IPscore is a unique evaluation tool of the European Patent Office (EPO), applying a qualitative approach that is focused on the analysis of characteristics such as legal strength of the patent and uses of the intellectual property. This method does not rely on analytical data but the valuation performed through the analysis of different indicators with the purpose of rating the intellectual property right, i.e. of determining its importance.⁵³

The valuation method that will be described in this thesis has parallels with the approach of the IPR. The aim of the alternative method is, to integrate an IP default risk factor to every IP, asset comparable to the ratings of S&P, Moody's or Fitch. According to this approach, every IP asset class has to be analysed individually.

The following chart represents all in Luxembourg legally protectable IP assets.

The calculation of the IP risk factor is based on the cart according to three main principles:

- Duration of protection
- The jurisdiction

⁵¹ Cf : Kaplan, R., Norton, D., Measuring the Strategic Readiness of Intangible Assets, Harvard Business Review, p.2

⁵² Cf : <http://www.epo.org/searching/free/ipscore.html> 02/10/2014

⁵³ Cf : European Commission, Fact Sheet, Intellectual Property Valuation, European IPR Helpdesk, 2013 p. 7-8

- The object of protection

According to these three values, an average risk factor could be calculated.

Taking the example of a patent. The patent is protectable for 20 years. The protection is based on a special law and to be patentable the protectable object has to be a technological inventory related to a product and process. A trademark however is only protectable 10 years. The result is a higher risk score for the patent.

	0 ----- 1									
	Uncertain	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	Secure
Duration of protection					Confidentiality / Secrecy	Tr. Marks	Registered design / Database rights		Patent Copy-Right	Domain names
The jurisdiction	Confidentiality / Secrecy				Database rights		Tr. marks	Registered design / Patent	Copy-Right	Domain names
Object of protection				Database rights.		Registered design	Tr. marks	Patent	Copy-Right	Domain names / Confidentiality / Secrecy

The risk factor of a	Patent is:	0,8 $((0,9 + 0,8 + 0,8) / 3) = 0,8$
	Trademark:	0,6
	Registered design:	0,7
	Copyright:	0,9
	Database rights:	0,6
	Domain names:	1,0
	Confidentiality / Secrecy:	0,5

Domain names on their side are under no legal protection. State or supranational bodies do not control them. Often, those domain names are personal or a company's property. Therefore they can decide rather to hold or sell the domain name. Without the accordance of the owner, the domain name stay in his right of a company's ownership. Due to that fact the Domain names got the highest rank.

Object of protection	Risk factor	Duration of protection	Protectable subject matter	Examination procedure	Example
Industrial Property					
Patents	0,8	20Y	Technological invention related to product and process. The invention must be novel, containing an inventive step and be susceptible of industrial application	A specification need has to be drawn up, which comprises a description, setting out a prior art or the improvement made by the invention	Internal combustion engine Ipod
Trade marks	0,6	10Y	A trade mark protects a distinctive thing. It protects names, logos, holograms etc. that distinguish the companies goods from its competitors	Application for a trademark to protect the company, its trading area and markets. The use of an unregistered brand name does not give rise to any trade mark rights	Nespresso Mc Donald's DuPont Mercedes
Registered designs	0,7	5Y-25Y	The visual appearance, the design of a product	Formal examination	Crocs
Other IP Rights					
Copyright	0,9	From the date of creation of the work throughout the life of the author and 70 Y after his death	Protects numerous categories of work such as novels and short stories, paintings, musical compositions or scientific publications...	The simple creation act is sufficient to acquire a right of protection for one's creative work. The work, which should be protected, must be original. It is the hallmark of the author's personality.	Goethe - Faust Munch - Der Schrei
(Copyright vs. Patent?)	0,9 or 0,8	In Europe = Protectable copyrights In Japan and USA = Protectable by	The general or specific programs of instructions designed for data processing	In Luxembourg, copyright is still the conventional way to protect software, the latter being linked to	Microsoft Office Firefox Windows

		Patents	equipment	literary work (the source code), and protection covers all the preparatory design work related to the given program	
Database rights	0,6	15 Y from the 1 st January of the year of setting up or the first publication of the database	Database, is a collection of work, data or other independent elements benefits from dual protection. (Copyright and a separate “sui generis” right owing to their peculiar nature	The copyright protection thus is only applied to the intellectual creations involved in selecting and organising, the method of compiling and ranking or the arrangements of the topics and themes addressed. The sui generis protection covers the financial investment and the investments in terms of human resources, effort and energy, made to obtain the contents of a database.	Customer-Database Sales force Database
Other tools of IP					
Domain names	1	Domain names are not true IP rights, because they are not granted by state or supranational bodies, but rather by private entities. They are “ rented ” from these entities.	Domain names are the internet counterpart of trade marks. They are the names, which identify internet sites, and establish a link between the content of the site and the IP address.	When doing business it is advisable for companies which have a registered trade mark to protect also his domain name, since the right conferred by a domain name should ideally reinforced by trade mark right.	www.streng.lu www.eufom.lu
Confidentiality / Secrecy	0,5	//	A secret kept in isolation is not a very effective mean of ensuring the continuity of a company. In case, the holder of the secret disappears, the company’s expertise and technical abilities will be limited or in worst case	//	The recipe of COCA COLA

		irrevocably lost.		
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The advantages of IP assets unlike intangibles are that IP assets could be traded. According to the Keynesian cross where the demand created its own supply⁵⁴, a pricing of the value of IP assets is relative simple as you can buy or sell IP assets as goods. A more problematic factor is the process of estimating economic life of an IP asset. The value and the economic life have very close relationship. Economic life could be described as the period during which it is profitable to use an asset. It ends when it is no longer profitable to use, or when it is more profitable to use another asset. For companies that use IP that is protected by law, the lifetime normally ends when the legal protection has come to his expiry date.⁵⁵ The difficulty is not to know the value of the IP assets today, but to evaluate the future value of the IP asset, the future royalties.

To valuate IP equitable, the valuator has to put himself into the position of the seller and buyer. Problem in this juncture is that the seller makes his calculation from another point of view as the buyer. The aim is to find a fair market value for the buyer and the seller. Here, we have to distinguish between the IP owner view and the view of the IP leaser or the person who has the right of disposal.

3.6.1.1 IP owner/seller view

$\text{Present value of the IP} + ((\text{Royalty per annum} \times (\text{Duration of protection} \times \text{Risk factor})) = \text{Future Retail Value}$
--

Calculation

Present value of IP (what the possible selling price on the market): 100.000 EUR

Royalty per annum (what can be generated by the IP asset): 10.000 EUR

Duration of Protection (ex. Patent): 20 Years

Risk factor (ex Patent): 0,8

⁵⁴ Cf : Gupta, Macroeconomics ; Theory & Applications p. 279

⁵⁵ Cf : Zareer, P., Valuation of Intellectual Property Assets, PWC, p.12

$$100.000 \text{ EUR} + ((10.000 \text{ EUR} \times (25 \times 0,8)) = 300.000 \text{ EUR}$$

The calculation of the future retail value is quite easy in consideration of the legal protectable IP assets with a fixed duration of protection. Taking an example of a Luxembourgish Biotech company called BIOLUX, which are offering patents on so called “designer Baby”. The company offers to families to give their DNA samples to obtain predictions about their children such as eye and hair colour, or susceptibility to diseases.⁵⁶ Because the method is based on a patent, the company can protect the process for 20 years. Based on the assumption that the development of the method has cost 20 Mio, the company could sell the patent for 5 Mio. per year. The retail value conferring to the alternative valuation approach is:

$$20 \text{ Mio (present value)} + ((5 \text{ Mio (Royalty)} \times (20 \text{ (years of protection)} \times \text{risk factor})) = 100 \text{ Mio}$$

3.6.1.2 IP leasers/buyer view

$$\begin{aligned} &\text{Production cost of the IP+ ((Turnover per annum} \times \text{Term until expiration of the patent,} \\ &\text{copyright etc.)} - (\text{Royalty per annum} \times (\text{Term until expiration of the patent, copyright} \\ &\quad \dots \times \text{Risk factor}))) \\ &= \\ &\text{Future Procurement Value} \end{aligned}$$

Calculation

Production cost of IP:	100.000 EUR
Turnover per annum (generated du to the IP asset):	10.000 EUR
Royalty per annum (due to the IP asset):	4000 EUR
Term until expiration of the patent, copyright etc.:	10 Years

⁵⁶ Cf : <http://www.wort.lu/de/lifestyle/patent-auf-designer-babys-524ee498e4b0866593721a89>
17/08/2014

Risk factor (ex Patent):

0,8

$100.000 \text{ EUR} + ((10.000 \text{ EUR} \times 10) - 4000 \times (10 \times 0,8)) = 168.000 \text{ EUR}$
--

This calculation approach is useable for every IP assets that has a fixed duration of protection. However, in case of assets without fixed duration of protection, like for example confidentiality and secrecy, the valuation approach is referring to the life expectancy of those assets. For the example of confidentiality or secrecy, life expectancy lies between 2 to 5 years.⁵⁷ Nevertheless, there are also exceptions, for example Coca Cola, whose recipe for coca cola is already more than 100 years under secrecy.

One problem of this approach is that the values of the intangible assets vary with the perspective of the valuator. It depends on which side of the table the valuator is situated. The owner values his IP with another approach than the leaser or buyer. Therefore the author has tried to develop a method that encloses the two perceptions. As conclusion the writer of this thesis couldn't find an all-embracing approach that is closed to the reality to calculate the "fair" IP value.

One possibility to calculate the "fair" value for the seller and buyer could be the arithmetic mean of the calculation from the buyer and seller side. This could be a good indication for a "fair" IP value for both interested parties. (see figure 16)

The author has the opinion that this valuation approach for protectable IP assets could reflect the value of such assets. Of course, it doesn't cover the factors of unidentifiable intangibles or differences in cost of capital. However, it reflects the R&D costs in the present value and the future value due to the future royalty revenue.

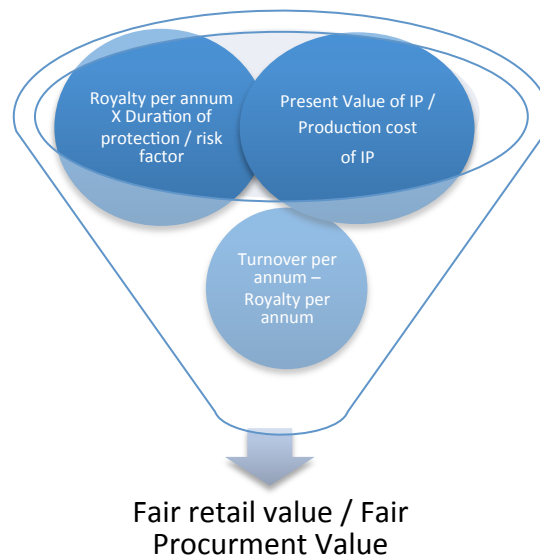
In accordance to the Luxembourgish tax regulation, this valuation approach is very beneficial because of the Article 50bis §§ 1 and 3 LIR introduces an 80% exemption regime for income derived from IP and from the sale of IP assets. IP acquired from a third party may include patents, software copyrights, trademarks, designs, models or domain names. In addition, article 50bis §2 provides a deemed deduction for patents

⁵⁷ Cf : <http://www.tagesspiegel.de/wirtschaft/produktlebenszyklen-immer-schneller-neuer/4041756.html>
17/08/2014

developed in-house. This exemption is limited to registered patents.⁵⁸ According to the recent investigation of EU watchdogs, the future of the Article 50 bis §§ 1 and 3 LIR regulating Luxembourgish tax benefits for example for Amazon is uncertain.

Regarding the classical valuation methods, the author thinks that this approach will estimate a market close value. It is not only based on hypothetical depreciation values. The only hypothetical value is the risk factor that is based on hard facts. It is a kind of an immovable contract price. The purpose of this approach is to know the worth of IP assets in order to simplify the trading or sale processes.

Figure 16: IP Valuation



Source: Own draft

The previous representation is certainly very simplified and doesn't take into account the different economical environments with their particularities. For example, the pharmaceutical industry where research and development costs for failures run more than five times the cost of research and development success,⁵⁹ however, it gives a good assessment for the majority of the future value without using hypothetical parameters.

3.6.2 The valuation of intellectual capital (IC)

Measuring the value of IC is the holy grail of accounting. Employees' skills, IT systems, organizational cultures and process optimisations are far more valuable for many companies than their tangible asset parts.

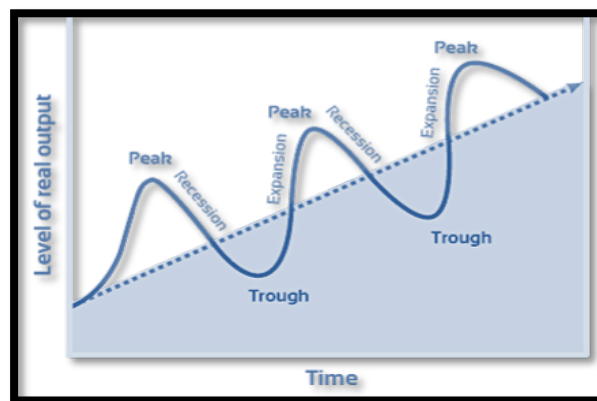
⁵⁸ Cf : Luxembourg for Business, Luxembourg, an Attractive IP Destination, p.9

⁵⁹ Cf : Zareer, P., Valuation of Intellectual Property Assets, PWC, p.9

Investors, who want to participate in early stage companies, especially technology, pharmaceutical or other intangible-motivated companies, are confronted to the previously mentioned problem of how fixing the worth of something that is intangible but provides advantages to the company. But the question about the value of OC, HC and InfC remains? It exists many ways how to project the value of a company for purposes of pricing an investment, but they are all related to the revenue and the profit projections of the entrepreneur as a starting point. In accordance to some set percentages or either by assigning weight to elements of the enterprise, many formulas then try to discount those projections.⁶⁰ This approach is based on assumptions about the profit and the revenue. However, during times of crises, the creditableness of such suppositions is strongly restricted.

It is important to recognize that the value of companies change with both the competition and the business cycle. Intangible driven companies are susceptible for short-term economic fluctuations in the background of a long-term growth trend, which corresponds to changes in economic conditions. According to Mankiw, these fluctuations are irregular and unpredictable.⁶¹ (See figure 17)

Figure 17: The Business Cycle



Source: KnowledgeBrief.com

Being aware of that the value of intangibles is based on the market fluctuations and a high number of different factors, the author tries to design a valuation method that implies several valuation approaches to provide a rational basis to determining reasonable pricing.

The financial projections provided from entrepreneurs are too imprecise for reliable

⁶⁰ Cf: <http://berkonomics.com/?p=1214> 22/08/2014

⁶¹ Cf : Mankiw, N., Brief Principles of Macroeconomics p. 316

analysis. According to the Angel Capital Association (ACA), it exists three methods that are particularly useful for determining the pre-money valuation of pre-revenue companies. If managers could find a way to estimate the value of their intangibles, measurement and management of a company's competitive position becomes much more easily and accurately.⁶² The author's valuation method is based on different affirmed valuation approaches, developed by renowned professors. In consequence; the author is able to design a realistic intangible valuation approach.

3.6.2.1 Existing approaches for measuring IC

3.6.2.1.1 Venture Capital Method

Pr. Bill Sahlman from the Harvard Business School developed this approach in the 1980. Based on a success scenario, his approach calculates a value for the entire company. Nevertheless, most business angels think that half of new ventures fail and the best an investor can expect from nine of ten investments is return of capital for a portfolio of ten. Based on Wiltbank Study, investors should expect a 27% IRR in six years.⁶³

The venture capital method starts by modelling cash flows in the future, but for valuation purpose it ignores all cash flows before time T.⁶⁴ In other words, the investor project the net income at the exit date. He discounts the terminal value to the present. (see figure 18) The choice of multiple for the valuation is something that will be matter of discussion during the venture capital negotiations. Normally price-earning ratios for comparable companies will be used as benchmark.

Figure 18: Ranges for Discount Rates in the Venture Capital Method

⁶² Cf : <http://www.angelcapitalassociation.org/blog/methods-for-valuation-of-seed-stage-startup-companies/> 22/08/2014

⁶³ Cf: Historical Returns in Angel Markets, 2010, RSCM

⁶⁴ Cf: Cumming, D., The Oxford Handbook of Venture Capital p.432

Stage	Discount Rate Range (p.a., %)
Start-up	50 to 70
First Stage	40 to 60
Second Stage	35 to 50
Third Stage	35 to 50
Fourth Stage	30 to 40
IPO	25 to 35

Source: The Oxford Handbook of Venture Capital

The selling price of the company could be estimated by establishing a reasonable expectation for revenues in the year of the sale and, based on those revenues, estimating earnings in the year of the sale from industry-specific statistics.⁶⁵

For example, a software company project at the exit date annual earnings of 2.500.000 EUR. According to the venture capitalist, the investment exit is in 5 years. The price-earning ration has been fixed at 15 %. The venture capital investor uses the target rate of return to calculate the present value of the projected terminal value. In this case, the target rate is 50%. After deduction of the terminal value to the present value, the company has a value of 4.938.271,60 EUR.

Calculation

$$(\text{Annual earnings at exit date} \times \text{PE ratio}) / (1 + \text{Required Rate of Return})^{\text{exit year}}$$

$$(2.500.000 \times 15) / (1 + 50\%)^5 = 4.938.271,60 \text{ EUR}$$

This approach encloses all assets of a company and is not specially based on the valuation of IC. It gives a global value of the company. Nonetheless, this approach has some interesting elements, which could be transferable to the authors approach

3.6.2.1.2 Scorecard Valuation Method

This method adjusts the median pre-money valuation for early stage companies, which

⁶⁵ <http://gust.com/blog/2011/11/01/startup-valuations-101-the-venture-capital-method/> 22/08/2014

deal in a particular region and on seven characteristics of the company.⁶⁶ The scorecard method is focused on the major factors in an investment, such as strength of the team, the product, the competitive environment, marketing and sales partnerships etc. The investor assigns a percentage weight according to the importance of these factors with a total value of 100%. Moreover, the investor ranks the company by comparing it with other companies of the market. The average ranking is 100%.

Is the company below the average ranking, the ranking is between 0% and 99%, is the company above the average; the ranking could reach 200%. The multiplication of the weight by the ranking gives a weighted scorecard value of each factor. By the addition of these values, the investor receives a weighted scorecard multiplier. The final scorecard-adjusted valuation is calculated by multiplying the average similar company valuation by the weighted scorecard multiplier.⁶⁷

Example

To provide an example, assume a company with an average product and technology (100% of norm), a strong team (200% of norm) and a large market opportunity (200% of norm). However, the company has some problems with their cash flow. (50% of norm). Looking at the strength of the competition in the market, the company is good situated (125% of norm) and early customer feedback on the product is excellent (Other = 150%). The company has excellent sales channels and partnerships (200% of norm). Using this data, the calculation can be accomplished. (See figure 19)

Figure 19: Example scorecard valuation calculation

Category	Weight	Ranking	Value
Average Similar			3.000.000 EUR

⁶⁶ Cf : <http://billpayne.com/wp-content/uploads/2011/01/Scorecard-Valuation-Methodology-Jan111.pdf>
23/08/2014

⁶⁷ Cf: Poland, S., Bucki, L., Startup Crash Course p.66

Company Valuation			
Team	30%	200%	$(0,3 \times 2) = 0,60$
Opportunity / Size	25%	200%	$(0,25 \times 2) = 0,50$
Product / Technology	15%	100%	$(0,15 \times 1) = 0,15$
Competitive environment	10%	125%	$(0,1 \times 1,25) = 0,13$
Marketing / Sales Partnerships	10%	200%	$(0,1 \times 2) = 0,20$
Need for additional invest	5%	50%	$(0,05 \times 0,5) = 0,03$
Other factors	5%	150%	$(0,05 \times 0,15) = 0,08$
Weighted scoreboard multiplier			1,6750
Scorecard Adjusted Valuation			5.025.000 EUR

Source: Own draft based on <http://billpayne.com/wp-content/uploads/2011/01/Scorecard-Valuation-Methodology-Jan111.pdf>

The calculation

<p>Average Similar Company Valuation X Weighted scoreboard multiplier =</p> <p>Scorecard Adjusted Valuation</p> <p>$3.000.000 \times 1,6750 = 5.025.000 \text{ EUR}$</p>

The scorecard valuation method includes closely a lot of intangibles that have an influence on the company. Therefore the basic concept of the author's valuation approach is based on this scheme.

3.6.2.1.3 Risk Factor Summation Method

This technique is very close to the scorecard approach. The method is comparing 12 characteristics of a target company to what might be expected in a fundable seed/start-

up company. Like the Scorecard Method, this method adjusts the median pre-money valuation for companies in similar business verticals and in a particular region.⁶⁸ This approach takes into consideration the number and types of risk factors in order to achieve a lucrative exit.⁶⁹

To use the risk factor summation method, the valuator has to assess the 12 characteristics of the target company. The valuator has to think about various types of risks and to scale them between +2 representative for very positive and -2 representative for very negative. Behind each judgment, there is a certain amount of money that has to be added or removed from the pre-money valuation of the company in that area.

Very positive	Positive	Neutral	Negative	Very negative
+2	+1	0	-1	-2
+500.000 EUR	+ 250.000 EUR	0	-250.000 EUR	-500.000 EUR

Example:

Assuming the average pre-money valuation of a pre-revenue company in Luxembourg is 3.000.000 EUR

Figure 20: Example Risk Factor Summation Method

Management	+2	Competition risk	0
Stage of the business	0	Technology risk	0
Legislation/Political risk	+1	Litigation risk	-1
Manufacturing risk	-1	International risk	-1
Sales and marketing risk	0	Reputation risk	+2

⁶⁸ Cf : <http://gust.com/blog/2011/11/15/valuations-101-the-risk-factor-summation-method/> 24/08/2014

⁶⁹ Cf : <http://billpayne.com/2011/02/27/startup-valuations-the-risk-factor-summation-method-2.html> 23/8/2014

Funding/capital raising risk	-2	Potential lucrative exit	+1
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Source: Own draft based on <http://gust.com/blog/2011/11/15/valuations-101-the-risk-factor-summation-method/>

Calculation

$$3.000.000 + (500.000 + 0 + 250.000 - 250.000 + 0 - 500.000 + 0 + 0 - 250.000 - 250.000 + 500.000 + 250.000) = 3.750.000 \text{ EUR}$$

The risk factor summation approach includes a very important factor: the risk factor. The author will take this element to implement it in his approach.

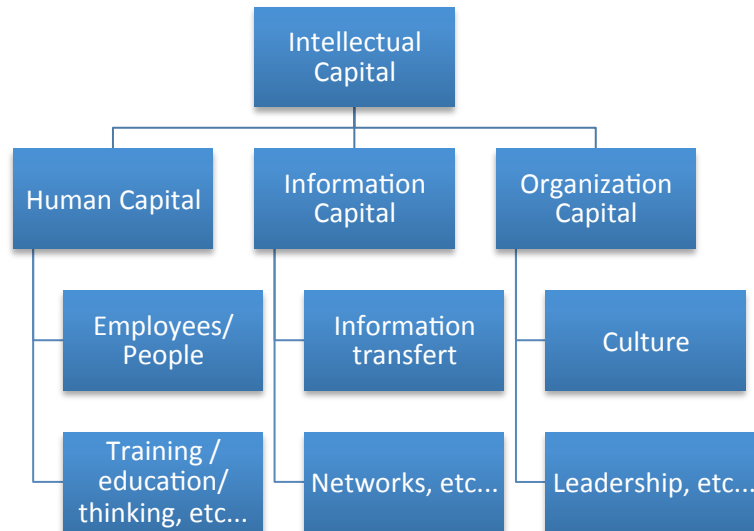
According to the writer of the thesis, a mixture of these valuation approaches could be the key for a realistic and economically viable approach. Therefore, the author has developed an approach that resumes a large number of important valuation factors. The name of that approach is RIV (Realistic Intangible Valuation).

3.6.2.2 Alternative IC valuation method

3.6.2.2.1 Composition of IC

During the analysis of intangible driven companies, the evaluator has not only to distinguish between tangible and intangible assets, but also to evaluate the intra-intangibles differences. Intangibles are in fact all “assets” that improve the value creation of a company, intellectual capital that is composed of Human Capital (HC), Information Capital (IC) and Organization Capital (OC). (see figure 21)

Figure 21: Intellectual Capital



Source: Own draft based on Intangible Assets, Tangible Risks, Adams, M., 2006

In the context of HC, the main focus is on the people, which are the driving force of the HC. It is strongly connected to the human capacities and has to deal with the value of the human capital. It measures the current value and invests to improve the future value. Sensitive areas of the human capital are the know how of the workforce, the educational level of the staff, the training structures of a business, the workflow process, talent management and a good employee and customer relation. In the case of human capital, strategic readiness is measured by whether employees have the right kind and level of skills to perform the critical internal processes on the strategy map. The first step in estimating HC readiness is to identify the strategic job families the positions in which employees with the right skills, talent, and knowledge have the biggest impact on enhancing the organization's critical internal processes.⁷⁰

The main task of InfC is to manage the collective knowledge and experience of employees. The transfer of knowledge and information is a key driver of economic growth. Information capital, consisting of systems, databases and networks makes information and knowledge available for the organization.⁷¹ A company should facilitate the access to knowledge because of the important influences on the company's value. Without information, a company is unable to adapt itself to market conditions or respond to market changes. Therefore the flow of information is a very important factor. A main part of InfC is to insure the management of the HC.

The third driving force of IC is the organization capital, which is perhaps the least

⁷⁰ Cf: Kaplan, R., Norton, D., Measuring the Strategic Readiness of Intangible Assets p.6

⁷¹ Cf: Kaplan, R., Norton, D., Measuring the Strategic Readiness of Intangible Assets p.8

understood. In accordance, the evaluation of these intangible assets is difficult. Successful companies had a corporate culture in which people were deeply aware of and internalized the mission, vision, and core values needed to execute the company's strategy. These companies strove for excellent leadership at all levels that mobilize the organization toward its strategy.⁷²

Regarding innovative business, it exist much more intangibles than listed below. However, the author has decided to limit the approach on those 18 core intangible buckets. Those intangibles are the drivers of a company; therefore the calculation of the corporate worth is restricted on their values.

3.6.2.2.2 Realistic Intangible Valuation (RIV Approach)

According to the author, the RIV approach is based on the idea of the risk factor summation-, the scorecard- and the venture capital- approach. The writer thinks that a risk factor in the valuation approach has to appraise the default risk of the intangibles.

Regarding the approach, the key risks are associated with HC could be the probability of staff turnover, inadequacy of skills levels and/or inconsistent diffusion across the company or the fact of an inefficient team culture.

The default risks that are in relation with the InfC are an inadequate documentation and diffusion of knowledge. Weak and/or inconsistent work processes as well as inadequate protection of proprietary knowledge or an inadequate management quality could increase the risk.

According to OC, the risks consist of the probability and vulnerability to customer or partner defections. Other risks could be the relationship loyalty to the corporate culture or other threats to the brand.⁷³

The risk factor has to categorise the default risk of the individual intangibles from 0 (no risk) to 1 (high risk). The ranking and the weight play the same role as in the scorecard model. The valuator allocates a classification according to the importance of the intangibles.

The total value of all factors is 100%. In a second step, the valuator tries to evaluate the company according to the benchmark ranking of 100%. Is the company ranked below the benchmark, the ranking has to be between 0% and 99%. Is the company ranked

⁷² Cf: Kaplan, R., Norton, D., Measuring the Strategic Readiness of Intangible Assets p.9

⁷³ Cf: <http://www.i-capitaladvisors.com/wp-content/uploads/2009/01/risk-factor-intangible-assets-tangible-risks-2006-06.pdf> 28/09/2014

above the benchmark, the ranking could reach a maximum of 200%.

The approach needs an initial accounting value of the company. This value represents the value of the company's tangible assets plus the value of the company's IP assets. The aim of the RIV approach is to calculate the value of HC, IC and OC and complete the initial value by adding the IC value.

Example:

Taking the example of a Luxembourgish start up company that wants to develop a highly secure digital payment solution named Luxpayment. In a first step, the default risk of each innovation bucket has to be determined. In this example, the risk to lose innovative minds to competitors is higher than having unproductive training structures. Moreover, the risk of inefficient Leadership higher compared to a fixed corporate culture.

Next, the valuator has to assign a weight on each innovation bucket. A well-trained and well-educated workforce is more important for innovative companies than heaving a well performing database system. Another example for innovative companies is the importance of an innovative corporate culture in contrast to a lower importance of marketing and sales at that moment of development.

In addition, the valuator has to compare the company with the benchmark. According to the author, it isn't sufficient to compare the company with the local benchmark. Today, in a highly global and connected world, where almost all markets are open, the benchmark has to be done on a global level in a particular sector. Here, the valuator has to do his benchmark on the global market of electronic payment facilities. An example is that due to the size of Luxembourg, well-trained workforces (90%) are scarcer than in other big economies. In contrast, the costumer relationship is clearly over the benchmark because of the proximity to the costumer,

To calculate the global value of the company's intangibles, the valuator has now different indicators: The initial account value, the total average risk factor, the weighted RIV multiplier and the total worth of intangibles.

To calculate the total enterprise value, those indicators have to be netting together.

Finally, the risk rate has to be associated with the RIV discount risk rate. Those 2 factors combine the market risk with the intangible default risk. This index has to be

included into the final value calculation.

Figure 22: RIV Discount Risk Rate

Stage	RIV Discount Rate
Start-up (0Y -2 Y)	1 - 0,8
Growth stage (1 Y– 7Y)	0,79 - 0,5
Established phase (5Y – 10Y)	0,49 – 0,30
Corporate Phase	0,29 - 0

Source: Own draft based on The Oxford Handbook of Venture Capital

The total intangible valuation calculation consists of:

- The initial accounting value (IP and tangible assets)
- Weighted RIV multiplier
- Total worth of the 18 intangibles baskets (estimation of the evaluator)
- The total RIV Risk Rate (intangible average risk default rate + RIV discount rate according to the company's lifetime).
- The value of the legal protectable IP

The RIV approach takes in consideration the whole company. Not only the accountable part but also the intangibles that are today main value drivers of a company. The valuator can have a realistic approach company's value, only by including all intangibles, the author has tried to involve the market- and intangible- related default risk, by using risk factors. In summary, RIV is an approach that tries to combine the actual value with the future value (in relation with the benchmark) of intangible in relation to their risks. The valuation of the different intangibles baskets is in the responsibility of the valuator, who has to ensure to compile a scrupulous inventory of intangibles.

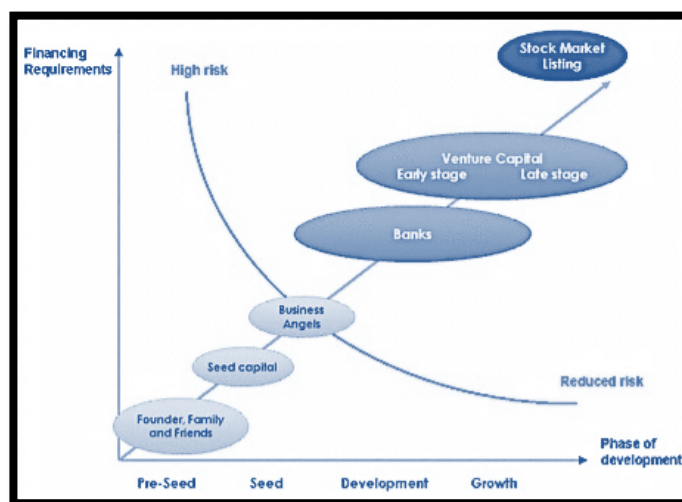
Calculation example Luxpayment

4 Intangible Financing Opportunities

4.1 Problems of financing IP and IC in the knowledge economy of Luxembourg

In general SMEs have access to a wide range of financing options from debt to equity to asset transfer. Loans are the traditional source of finance for small businesses and are usually used to finance assets or to meet other longer-term capital needs. This spectrum of financing is often only implementable in theory. Creating a business means taking risks. Very often, these financial risks are the most important problem in traditional funding. The initial equity capital usually consists of the entrepreneur's personal resources. This first contribution is the most important as it serves as a tangible indication to future investors, showing that the entrepreneur believes in his project and is ready to stake his own resources.⁷⁴ Often this invest isn't sufficient to start and run a business and therefore a demand for more cash is necessary. Getting credit to start doing a business is for every company an important obstacle. For innovative and intangible based companies, this situation is even more difficult. Intangibles or intangible assets cannot be used as collateral. The absence of collateral due to their business model (Start-up, young and innovative company, high R&D costs etc.) is the biggest problem for financial institution or investors. (See figure 23)

Figure 23: Different source of financing



Source: www.innovation.public.lu

Balance sheets do not represent the total value of IP and certainly not the value of IC.

⁷⁴ Cf : <http://www.innovation.public.lu/en/financer-projets/creation-entreprise/fonds-investisseurs-prets/index.html> 21/08/2014

The current regulations (BASEL III, CSSF regulations etc.) actively work against the consideration of IP and IC as an asset class. As a result from that approach, Luxembourg a real and important disconnect between banking regulation and practice and growth ambitions is noticeable. Luxembourg has to understand that IP and IC are the future cash cows of Luxembourg. Becoming an innovation and R&D hub is an important challenge to keep economic growth going. The traditional fixed assets economy as a main part of the manufacturing industry is changing. Intangibles will influence the whole economy. Till today, a lot of people consider that IP and IC are “unbankable” and therefore, a need of change is inevitable.

The mainstream lending needs cost-effective and standardised approaches in order to capture and process information on intangibles (which is not currently being presented by SMEs). It also requires assistance to facilitate effective controls to be taken over the assets. Initial activities may be best focused on cases where traditional security is known to be insufficient or unavailable. In these instances, it is important for a lender to capture as much as possible in its security envelope because he does not have the comfort of ‘conventional’ assets as a fall back.

Even if Luxembourg promotes a culture of intangibles, other countries already have begun to make the change happen. For example Malaysia and Singapore are introducing guarantees to facilitate IP-backed lending. Other initiatives come from Denmark or India, supporting the development of IP marketplaces. Germany on his side has sought to articulate the ‘Wissensbilanz’ to assist financial analysis of individual firms. Nevertheless, Brazilian banks are experimenting with IP audits prior to lending.⁷⁵ So why not doing a step further? Luxembourg could be the next who is innovative on financing intangibles.⁷⁶ Therefore more financial institutions have to warm up to the potential value of intangible assets, particularly if the add value to the company could solidly be demonstrated. With an appropriate valuation method this is realistic.

Analysing the lifecycle of a company, the need for different funding methods becomes understandable. Financial needs and options change as the business growth. During the growth phase, companies gains experience and become established. With those changes, the possibilities of funding are also changing. High levels of risks and uncertainty generally represent young companies.⁷⁷ Therefore, those innovative companies are open for alternative funding opportunities and approaches.

⁷⁵ Cf : Brassel, M., King, K., Intellectual Property Office, Banking on IP? p.13

⁷⁶ Cf : Brassel, M., King, K., Intellectual Property Office, Banking on IP? p.13-14

⁷⁷ Cf : Munari, F., Oriani, R., The Economic Valuation of Patents, p.312

4.1.2 Debt funding

4.1.2.1 Traditional bank loan for intangibles based companies

Banks are good partners for companies when it concerns lending money for fix assets like plants, machinery or buildings. However, if a company needs funds for identifiable or unidentifiable intangibles assets like trademarks, IP, employee training etc., it is difficult to convince banks to lend money for such projects. IP and other knowledge “assets” aren’t appreciated in mainstream lending. Especially in Luxembourg, financial institutions still live in their “traditional financial world” cocoon. This is the reason why IP and IC are very rarely funded by mainstream lending in Luxembourg. However, this is probably changing due to the introduction of two Chinese banks on the Luxembourgish financial market. The Bank of Communication⁷⁸ and the China Merchants Bank⁷⁹ are pioneers on supporting intangibles and IP driven companies all around the world.

In Luxembourg, an adequate level of equity capital and collateral are necessary to get a bank loan accepted. Without equity the doors to a bank loan normally remain closed. The term and informal lending method of financing consists in the provision of an amount of money, which is used by the company to carry out a specific project, for example to purchase of production equipment. In return, the company undertakes to repay the amount received and to make interest payments.⁸⁰

In Luxembourg, this method of financing a business is normally used by the companies based on fixed assets or by service provider. These companies make use of bank debt to finance the business, from the purchase of fixed assets to the partial financing of working capital.

In contrast to a loan, that is a long-term debt that arises when a commercial bank lends a sum, which is repayable over an agreed period, a credit is a short or medium-term borrowing.

Loans or credits are the result of a commercial agreement between a bank and a legal

⁷⁸ Cf : <http://www.wort.lu/de/business/finanzplatz-bank-of-communications-kommt-nach-luxemburg-54059492b9b398870805e53c> 29/06/2013

⁷⁹ Cf : <http://www.wort.lu/en/business/china-merchants-bank-fourth-chinese-bank-eyes-luxembourg-hq-53b283c1b9b39887080403e5> 29/06/2014

⁸⁰ Cf : <http://www.innovation.public.lu/en/financer-projets/creation-entreprise/fonds-investisseurs-prets/index.html> 21/08/2014

entity. The agreement establishes an understanding with respect to the principal (the total sum borrowed), interest rate and repayment schedule. In general, banks do not wish to take part in the management of the business; rather, in return, they require guarantees to ensure the repayment of their debt. This method of financing is therefore most often granted to companies that are able to offer solid guarantees to the lending institution.

Today, banks neither want to do nor play the role of investors, nor to act as shareholders, thus they are still acting conservative. Their main role is to lend secured money to established companies. The problem with financing intangibles is, that banks don't want to carry a value as a security. Intangibles may increase the value of a company, however this appreciation is actually still not accepted as a collateral by financial institutes.⁸¹ The aim of the thesis is to convince financial institutions to change their opinion according to loan financing for IP and other intangible driven companies. As soon as banks can value IP and IC by a realistic approach, knowledge "assets" could act as collateral. Collaterals are often not the only problem, but both the reputation of the company and the relationship with the bank has an influence on the realisation of a credit.

The author's opinion is that IP and IC have to be considered as guarantee to secure bank loans. For innovative companies, IP and knowhow represent the corporate capital.

For example, banks could take in consideration new supply agreements, a training program for new competencies, IP acquisition, information networks, innovative process improvements, productivity enhancements or employee and customer relations for their credit decision. These are strategic intangibles that a banker could take in consideration when working on a loan or credit for an IP or IC driven company.

4.1.2.2 Intangible asset-based loan

This loan is intended solely for equipment that is collateralized. If you need a significant amount of capital equipment, you can finance these purchases. The purchased equipment doesn't even need to be specifically tied to the funding you receive.

⁸¹ Cf :

http://www.bdc.ca/EN/advice_centre/articles/Pages/prepared_borrowing_money_intangible_assets.aspx
21/08/2014

Sometimes you can even use this loan to fund growth in other areas.⁸² This kind of funding is quite rare because banks don't take the risk to evaluate equipment. One of the most important reasons to choose debt finance is that this approach allows companies to structure deals without diluting equity investors. For companies, debt is often an attractive option, both to finance on-going operations and to expand. When choosing debt, companies may opt for more traditional instruments, such as leveraging accounts receivable or inventory. Asset-based lending is usually done when the normal ways of raising funds by for example traditional bank loan is not possible or when there are no other securities. Regarding to IP and IC, the author could imagine a kind of intangible asset-based loan. However, this approach isn't very common on the Luxemburgish market and IP and IC are still too unknown for using it as a financial vehicle. Financial markets for fixed asset-backed loans (not intangibles) are already well developed and take many forms. Consumer loans, such as home mortgages and auto loans for individuals are the staple of the credit and banking system. It is quite near to the traditional bank loan. Inventory and equipment loans for businesses are available from either traditional banking sources or from specialized asset-based lenders. Specialized asset-based lending includes assets such as accounts receivable and extends from straightforward loans to complex leaseback arrangements.

4.1.2.3 IP asset-backed funding

In order to avoid the funding gap that appears when companies do not have access on funding alternatives, the patents can act as a tangible signal for the ability of the companies to transform research investments into new and potentially valuable knowledge.⁸³ The sale and leaseback model is today applied by some companies to secure short-term funding by selling a portfolio of IP to a firm along with an agreement to receive a license for the IP to continue commercialization and business operation. The author can imagine that the portfolio could be exchanged by other intangibles like a well-trained workforce, optimized workflow or the simple reputation of a company. Even if their valuation is difficult (such an IC portfolio), these assets also have a value.

IP asset-backed securitization is mainly used by the music and film industry and is

⁸² Cf : <http://earlygrowthfinancialservices.com/startup-funding-identifying-best-funding-option/>
30/09/2014

⁸³ Cf : Munari, F., Oriani, R., *The Economic Valuation of Patents*, p.311

getting the more and more commonly used in the technology sector. Given the complexities and risks of this operation, it is necessary to examine carefully several factors, for example IP asset value, the taxation of the country where the operation is effected, the risks that is related to the intangible concerned and so forth. All this factors if intangibles requires certainly a deeper IP and IC due diligence than for all other normal commercial negotiations.⁸⁴ Although IP assets can generate large cash flows, their use as the basis for funding structures is not straightforward. The difficulties have sometimes been exaggerated and the fact that many in the securitisation field are relatively unfamiliar with IP rights has not helped. Most people involved in this type of financing will have their own mortgage or tenancy agreement, and will understand at least the basic features of the assets that have historically been used for this type of financing structure. Therefore, fear of the unknown is clearly a factor.⁸⁵

4.1.2.4 IP and IC sale and leaseback

Venture debt is a kind of funding, applied as a short-term financing mechanism to immediately obtain liquidity. At least in short-term, it is very close to equity funding. The difference is the maturity of long-term versus short-term. In the long-term, you will have to repay this debt, regardless of company performance. For term loans, typically repayment terms are multi-year (three years being the most common).⁸⁶ Besides the classical funding arrangements, the „sale lease-back model“ is interesting for companies that want to raise capital for further innovation and business development. In this case, the company receives instantly after transaction the funding and can immediately reinvest in his business and the licensing firm structures the contract to pursue continued monetization of the asset. This approach is already applied to fix assets like buildings or cars. According to IP and IC, this method is already in development but until banks are willing to use such a technique there is still plenty of time to elapse.

A sale-and-lease-back transaction enables a company to monetise their intangible asset, while retaining the exclusive rights of their IP or IC for strategic purposes.

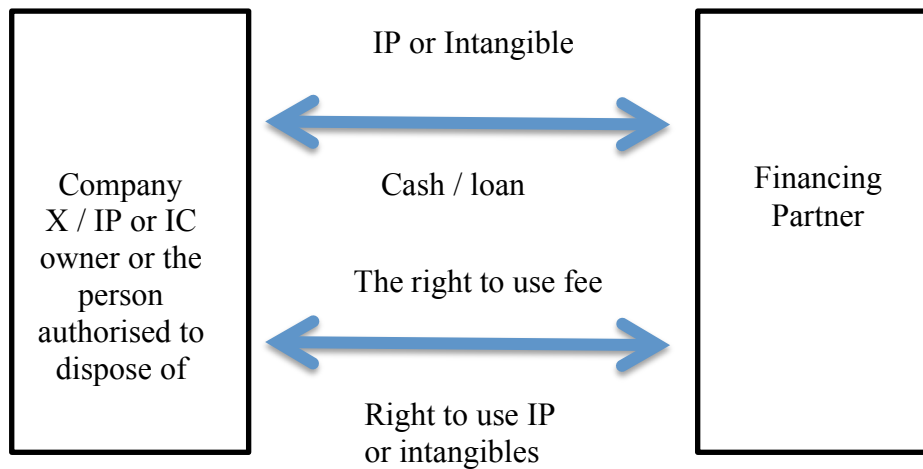
In Luxembourg, there are already a number of companies that are specialized in the financing advisory of IP-based companies. Those companies are: Saphir, Edison Capital Partners, Capital4IP or European Capital Partners.

⁸⁴ Cf : European Commission, Fact Sheet, IP assets for Financial advantages p.4

⁸⁵ Cf : Jones, N., Hoe, A., Global, IP backed securitisation : realising the potential, p2

⁸⁶ Cf : <http://earlygrowthfinancialservices.com/startup-funding-identifying-best-funding-option/>
19/09/2014

Figure 24: IP Sale and leaseback



Source: own draft based on, <http://www.capital4ip.com/financing.html>

According to the model, the possibility of intangible based companies to sell their IP or IC assets is implementable. Therefore selling IP or IC to a financing partner is marketable. This transaction is based on a fix cash deal from the financing partner to the selling company. In return, the financing partner leases back the same asset under payment of fees to the former owner. This is called the loan interest.⁸⁷ At the end of the contract, the company X normally has the option to buy back the ownership of the asset at a fixed price. In accordance, the company X can get cash on short-term and keep at the same time the IP asset or the intangibles in her property.

⁸⁷Cf : <http://www.capital4ip.com/financing.html> 20/09/2014

4.1.3 Equity funding

4.1.3.1 Crowdfunding for IP and IC

Innovative businesses can now use social media sites such as Nubs⁸⁸, Kickstarter⁸⁹ or Indiegogo⁹⁰ to request for financial support through “crowdfunding” campaigns. Innovative entrepreneurs, filmmakers or craftsman attract sponsors by posting their imaginative projects or plans, and often by promising incentives to those who pitch in some money. The advantages range from product sample to an invitation to join a company sponsored activity. This kind of funding has positive and negative facets. On the one hand side, it is a very easy and flexible way to get money in order to realise a project. However, this is only possible for “quite” small projects. In Europe, the acquisition of millions of euros only by crowdfunding is quite rare. Even in presence of global crowdfunding success stories, this approach is pretty complicated for Luxembourg because of the absence of a large mass of small investors that want to invest in such innovative and unsure projects. The traditional way of thinking of the Luxemburgish population (crowd) is a barrier for this funding approach. They prefer to participate in safe investments rather than spending money on unknown IC or IP. Another crowdfunding-related problem is the current lack of regulation around this funding approach. Regarding the fraud on funding portals or the protection of privacy of information obtained from investors using their platform, it exists any official law like for example the JOBS Act law from April 2012 in the United States in Luxembourg.⁹¹ There is no guarantee that crowdfunding investors will have a return on their money. That makes this approach risky for both, investors and entrepreneurs. Till today, there is an absence of confidence for that funding approach. For that reason, the author thinks that crowdfunding could be useful in Luxembourg for small start-ups or individual projects, but not for financing intangible driven companies.

4.1.3.2 Angel networks and syndicates as investors for intangibles

⁸⁸ Cf : <http://discover.nubs.lu/> 21/09/2014

⁸⁹ Cf : <https://www.kickstarter.com/> 21/09/2014

⁹⁰ Cf : <https://www.indiegogo.com/?locale=de> 21/09/2014

⁹¹ Cf : Cunningham, W., The Job Act, Crowdfunding for Small businesses and Startups p.14

Business angels or syndicates could be one of the first addresses for start-ups and smaller companies to raise capital. Business angels are normally wealthy individuals, which are willing to finance innovative ideas. These investors are interested in high-risk innovative organisations in order to get in return a high profit. Some of these recognise the importance and value of IP and IC, however many do not. Their investment could range from 12.000 to over 300.000 EUR. The norm is between 60.000 EUR and 150.000 EUR. These investors do not normally seek a controlling interest or management position in the business. There could also be an only non-economic interest, like for example fun or enjoyment related to a young and growing company.⁹² When more business angels are investing together in one company, we could speak about a syndicate investment. A syndicate is thus a union of several business angels.

The traditional business angels invest into a company as a unit and not into IP or IC per se and thus they are financing intangibles only indirectly. They aren't interested in the different IP assets or IC, which characterize the company, but only in the company as a whole unit. In return to their investment, they receive an equity stake of a company with owns IP/IC and intends to exploit the IP or IC.

A new generation of business angels is going to build a new form of equity funding. These business angels target IP and IC assets, looking for promising early stage innovation and inventions. They are looking for entrepreneurs and start-up companies to invest in IP and other intangibles for development and commercialization purposes, even before start-up.⁹³ They are investing in ideas or processes, knowing that this invests are highly risky and that the failure rate of that invests are quite high. Nevertheless, the chance of ultra-high and short-term return is for those investors more interesting than a stable return on their financing. It does not matter, if some invests on IP or intangible fail, but it is sufficient when one single invest compensate the default of the others and generates a profit. The Luxembourgish business angel network (LBAN) work more the traditional way. They do not hunt IP or IC driven companies. Therefore this niche investment for wealthy individuals is quite unexploited.

4.1.3.3 Financing IC and IP through venture- and private-capital

According to the European IPR Helpdesk, venture capital is one of the most important

⁹² Cf : Carter, S., Jones-Evans, D., Enterprise and Small Business, p.360

⁹³ Cf : <http://www.athenaalliance.org/apapers/MaximizingIntellectualPropertyandIntangibleAssets.htm>
22/09/2013

sources of finance for technology-based companies to fund their innovation. Venture capitalists are ready to give capital in loan form to a company and want in return warrants for equity in the company and in addition interest paid on the loan. They do not invest for an immediate profit. They allow the company to expand, as their final objective is to increase its value for a consequent profit greater than the initial investment.⁹⁴ This financing structure gives the debt issuer a strong upside as an incentive to lend to an otherwise risky enterprise.⁹⁵ That is why venture capitalists are more interested in innovative SMEs, which may have little performance history but a strong growth potential.

One of Luxembourg most known Venture Capital Company is Genii Capital. It was created in 2008 by two Luxembourgish investors, Gerard Lopez and Eric Lux and has a particular focus on emerging markets.⁹⁶ In accordance to their investment philosophy, their aim is to create value by investing in ideas, brands, and projects that are innovative and often disruptive for their business environment.⁹⁷ This is exactly what Luxembourg needs now. However, reality but in reality, such funding supports only few companies.

Figure 25: Number of Venture capital deals in Europe between 1995 and 2004

Country	No. of Firms Receiving Financing	Average Funds Disbursed Per Financing Round (\$000)
Austria	158	14014
Belgium	318	11159
Cyprus	11	13243
Denmark	298	13777
Finland	590	6974
France	2512	16055
Germany	1522	21242
Greece	38	19453
Iceland	22	4430
Ireland	276	15266
Italy	440	24131
Luxembourg	47	86522
Netherlands	586	18797
Portugal	193	5112
Spain	427	12909
Sweden	575	10412
Switzerland	244	12758
U.K.	3949	17159
Total	12394	333861
Average	652	17572

Source: Venture Capital in Europe

The number of companies who received venture capital up to the year 2004 is quite low; the average fund disbursed is therefore the highest in Europe. This is further strengthened by a favourable jurisdiction for launching regulated private equity funds with the implementation of a dedicated private equity and venture capital investment

⁹⁴ Cf : European Commission, Fact Scheet, IP assets for Financial advantages p.6

⁹⁵ Cf : <http://www.athenaalliance.org/apapers/MaximizingIntellectualPropertyandIntangibleAssets.htm> 23/09/2014

⁹⁶ Cf : <http://www.genii-capital.com/about-us.htm> 22/09/2014

⁹⁷ Cf : European Venture Capital, Entrepreneur Resources, Technology Media & Communications p.21

vehicle.

For example the investment company in risk capital (société d'investissement en capital à risque - SICAR) or the introduction of the specialised investment fund (fonds d'investissement spécialisé - SIF) have created regulated and operationally flexible and fiscally efficient multipurpose investment vehicles for institutional and qualified investors.⁹⁸ The Luxembourg SICAR legislation is referred to so called "risk capital", which means that the investments made by a SICAR have to tolerate a certain risk and with the willing of a profit after a certain period of time.⁹⁹

4.2 Innovative IP and IC financing opportunities

4.2.1 Private / Public loans

The existing capital framework for banks, which was developed by the Basel Committee for Banking Supervision and transposed in EU law via two adaptations of the Capital Requirements Directive, tries to strengthen prudential banking rules. In addition to requiring more and higher quality capital, the law imposes higher capital charges for market activities and enhances rules on the management of liquidity risk.¹⁰⁰ On the European level, the Commission in accordance with the European Banking Authority will facilitate the access to loans for innovative SME's or private persons. The Commission has proposed a number of new financial instruments that should facilitate SMEs' access to finance also in the future (2014-2020). It is important to ensure more simplicity and better coherence between the different EU funding schemes.

The Commission introduced the principles of debt and equity platforms that will standardise the common mechanics of the instruments, streamline relations with financing partners and foster administrative efficiency.¹⁰¹ This project is also known as

⁹⁸ Cf : ALFI, Luxembourg, Private Equity and Venture Capital Investment Vehicles p.4

⁹⁹ Cf : Luxembourg for Finance, Luxembourg Private Equity and Venture Capital Investment Vehicles, p. 5

¹⁰⁰ Cf : European Commission, MEMO/13/690 , Capital Requirements - CRD IV/CRR – Frequently Asked Questions 16/07/2013

¹⁰¹ Cf : European Commission, Communication from the commission to the council, to the European Parliament, to the Committee of regions, and to the European and social committee, An action plan to

the Horizon 2020 program. The Commission has proposed a EU Debt Financial Instrument for the growth of enterprises, research and innovation. It may provide guarantees and other forms of risk sharing in order to improve lending to SMEs, as well as research and innovation driven SMEs. Some proposals for that simplification are¹⁰²:

- debt financing by loans, subordinated and participating loans or leasing to reduce the particular difficulties SMEs face in accessing finance for their growth
- securitisation of SME debt finance portfolios to mobilise additional debt financing for SMEs. The Loan Guarantee Facility except for loans in the securitised portfolio, cover loans up to €150 000 and with a minimum maturity of 12 months.
- set up a guarantee facility especially for SMEs, which are operating in the cultural and creative sectors.
- financial support to microfinance for micro-enterprises and social enterprises. The supply of loans to micro-enterprises and promotion of the adoption of the European Code of Good Conduct for Microcredit Provision.

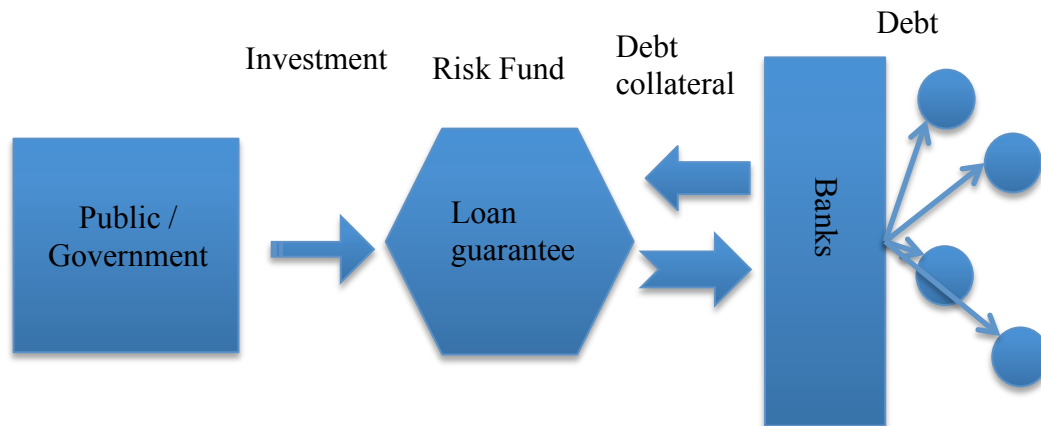
In according to the ideas of the European commission, Luxembourgish banks have also the task to think about alternative funding ideas for innovative companies. Innovation is the most important factor for making Luxembourg's businesses competitive. With the loss of the bank secret in 2015, the Luxemburgish banking landscape will change radically and therefore Luxembourg's banks have to reinvent themselves. It isn't sufficient that the government organises plenty of conferences about innovation or print expensive catalogues to attract innovative companies. They also have to think about the funding of innovative companies without capital reserves but with a huge value of IP and IC. Therefore, the author thinks about private/public loans, where the government work as a guarantor and the private banks as creditor. With this idea, private banks can accord intangibles-based loans to companies. (see figure 26)

Such loans have to be accessible to every company, which fulfil predefined risk criteria. The European commission applies already such a program with loan guarantees. The reduction of the exposure to risk should encourage banks to make more debt finance available to SMEs, including microcredit and mezzanine finance.

improve access to finance SME's , 2011 , p. 7

¹⁰² Cf : European Commission, Communication from the commission to the council, to the European Parliament, to the Committee of regions, and to the European and social committee, An action plan to improve access to finance SME's , 2011 , p. 9

Figure 26: Risk Sharing Finance Facility



Source: Own draft

An example for such criteria could be the sophistication and elaboration of the idea, compared to a flash of genius. Another criteria could be that the entrepreneur has already invested a certain amount of own money in his project. Luxembourg needs innovative research- and developmental-base projects that are capable to bring an added value to the Luxemburgish innovative landscape. Main tasks of the banks are to check that the funding they provide is based on IP and IC and not on fixed assets. The model is a kind of risk Sharing Finance Facility¹⁰³, but not only for Research oriented SMEs & Small Mid-Caps, but also for all companies based on IC or IP.

4.2.2 IP and IC Innovation Fund Luxembourg

Innovative companies have IP and/or IC as a main part of their business assets. In the case of technology-based start-ups or IT companies, it exists business models that even have no other assets than their intangibles. Even for those companies, the possibility to use their intangibles to access finance must be guaranteed. During the last years, Luxembourg has tried to make some steps forward in alternative funding models, but the results are quite modest.

The financial support consists of some specific financial aid like the start-up/take or equipment loans offered by the Société Nationale de Crédit et d'Investissement (SNCI). The Société Luxembourgeoise de Capital-Développement pour les PME S.A and the Ministry of the Economy promote high-growth-potential businesses with special aids during a fix period of a business development stage.¹⁰⁴ On the first glance, this seems

¹⁰³ Cf : http://ec.europa.eu/invest-in-research/funding/funding02_en.htm 26/09/2014

¹⁰⁴ Cf : <http://www.innovation.public.lu/en/financer-projets/creation-entreprise/index.html> 27/09/2014

quite a lot, but those financial supports are only government subsidies and no real funding alternatives. For this reason, the author has tried to develop an alternative funding approach. The idea for that funding method is based on the approach of the European Investment Fund. Their mission is to encourage financial intermediaries to increase their lending volumes by guaranteeing part of the risks they may incur on their portfolios of SME loans or leases. The financial institutions must demonstrate that they offer improved access to finance for innovative companies. This is possible by either taking more risks like reducing collateral requirements or by increasing loan volumes to start-ups.¹⁰⁵

The basic idea of the fund is not to provide loans, subsidies or cash out from that fund to innovative companies. The main mission is to give IP- and IC-based companies an access to finance. Often, the market of intangibles has no access to the traditional funding methods. Therefore, promotion and implementation of equity- and debt-based financial instruments is necessary, especially for this market segment. The idea behind the fund is to collect money to invest on intangible-based innovative companies. The legal structure of Luxembourg determines the legal form of the fund. The fact that the fund would invest in companies that are not listed on the stock exchange, forbid the structure of an OPCVM. Therefore, the fund must be under the juridical form of an FIS, SICAR or FIA. The risk of the investment is therefore accountable. The management of such investment funds could be under private or a public supervision. However the aim should be to invest the money in innovative, IC and IP based companies.

The challenge for the Fund Manager is to invest in the promising companies. Even if there is a default of eight companies out from ten, those two, which survive, has to generate so much profit that they compensate the loss of the other eight companies. As the investors are running a high risk, they expect also a high return with the intention to reinvest in new IP and IC driven companies. With this model, the volume of the fund could be increased and the number of funded enterprises heightened.

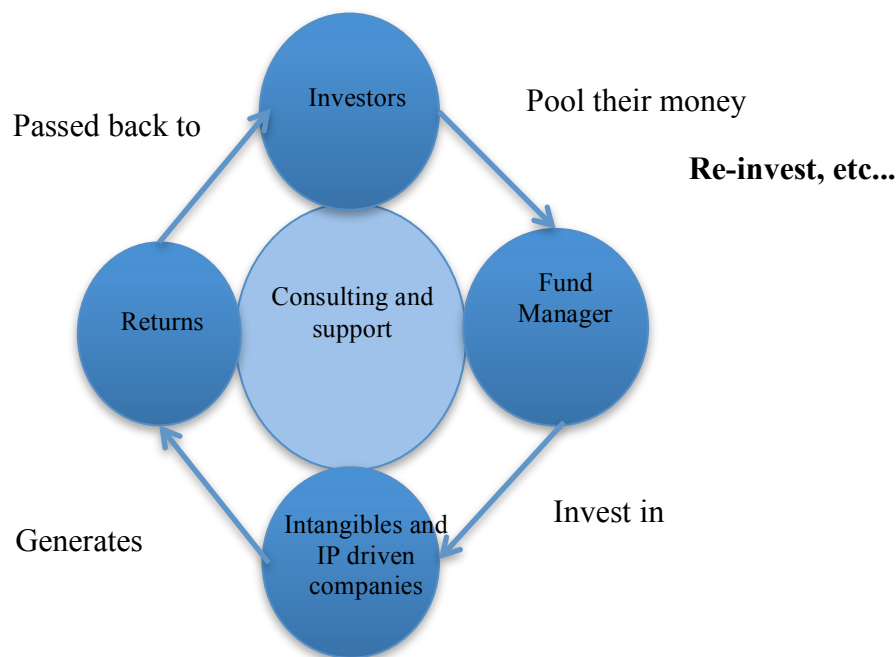
Another mission of the IC and IP Innovation Fund Luxembourg should be the consultancy and management support for financed companies. This would help companies to develop a corporate culture and give the asset manager the possibility to have a certain control on the funded companies.

Often, IC or IP driven companies have high skilled people in their team. However, the

¹⁰⁵ Cf : EIF's support for small and medium-sized enterprises (SMEs), EIF, p.2

launch or run of a company is fraught with many administrative and economic challenges. A specialized fund team could support those companies during the investment time. It doesn't matter if the asset manager is provided by the government or by a private investment company. The advantage of that dual capacity of the asset manager is that he can analyse the company as a whole and not only on the economic return on capital. (see figure 27)

Figure 27: Innovation Fund



Source: Own draft

Exemplary for such a funding approach is YOZMA. The Israeli venture capital group makes equity investments in technology companies that are engaged in fields where Israel has finally become a world leader. The Group targets high-growth companies in the sectors of Communications, Information Technologies and Life Sciences.

In accordance to their success, the group has launched other innovative funds such as Yozma II, which commenced operations in September 1998 or Yozma III in 2002.

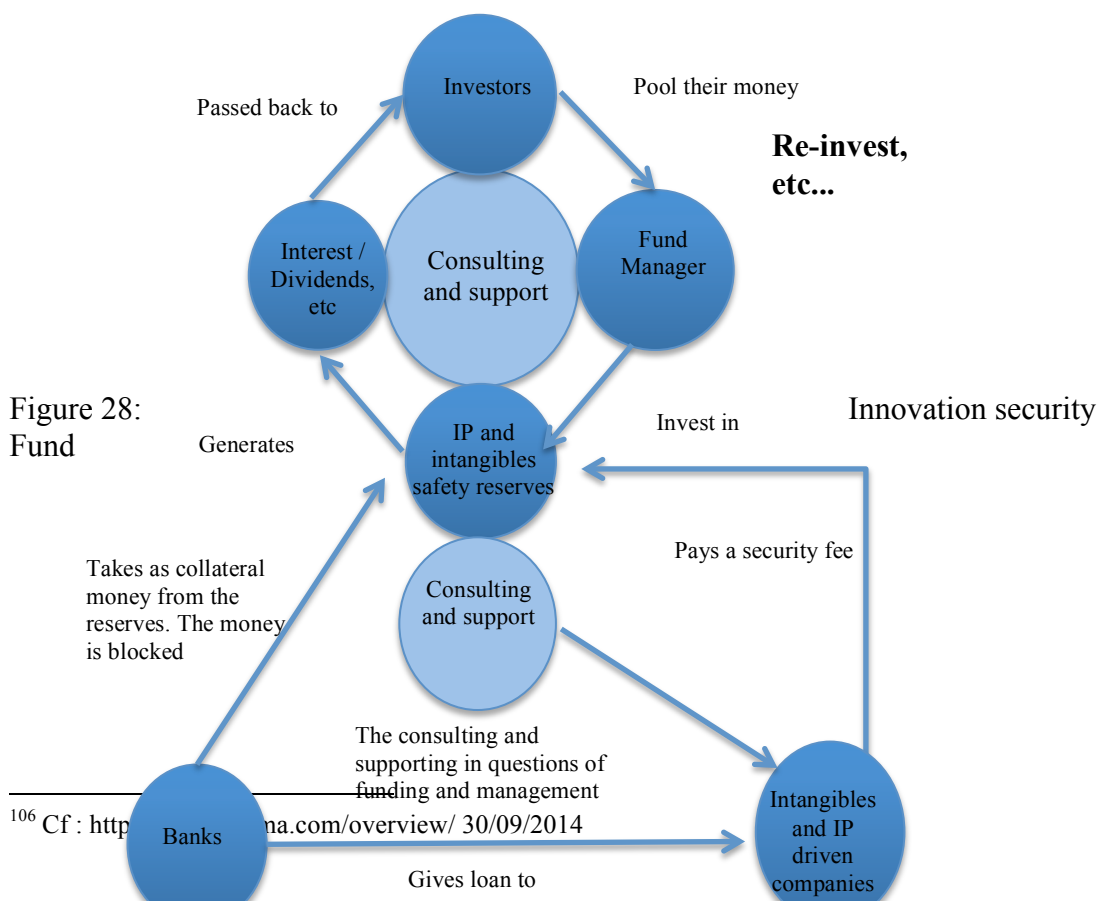
According to Yigal Erlich, Founder, chairman and managing partner of the Yozma Group, Yozma II & III continued the successful strategy of making direct investments in technology companies and to play a significant role as a value added investor by recruiting senior managers, formulating business strategies, raising additional capital

rounds and attracting strategic and financial investors to its portfolio companies¹⁰⁶

4.2.3 Intangibles Innovative Warranty Fund

This funding approach is quite similar to the innovation fund. The main difference is that the fund manager does not invest directly in IC and IP driven companies, but manages only an “IP and intangible security fund”. Since this fund has to act as a collateral basket, the investment period of that fund has to stay flexible, because it can be used as a short-term warranty. In consequence, the author has the opinion that the fund has to invest on short-term bonds, hedge funds or other liquid high rated companies to generate anyhow a return and stay flexible.

IP and IC driven companies who profit of the service of the fund have to pay a security fee that is based on the amount of the collateral blocked by the bank due to their amount of loan. In contrast to the previous model, the average yield spread of the fund is much lower because of less risk investments from the fund manager according to the investment politic (security fund). (see figure 28)



Source: Own draft

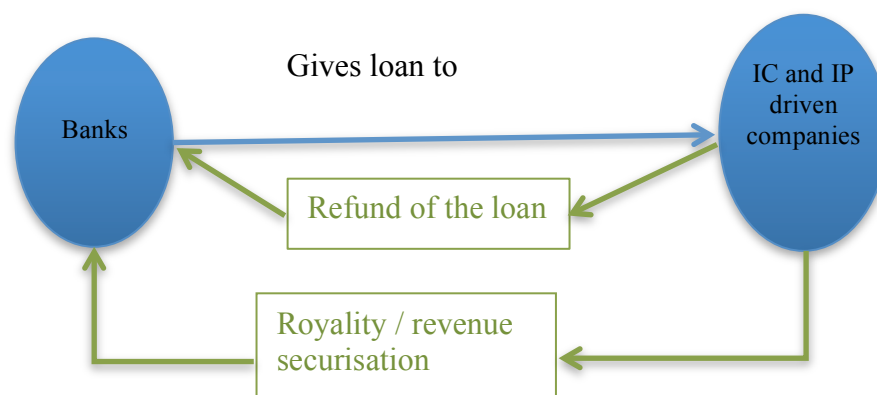
The special feature of this approach is that the fund acts as a credit default security. IP- and IC-based companies can use that warranty fund as collateral for their bank debts during a certain period of time. The approach refers to the idea that when a company is requesting a loan, the financial institution can ask the fund manager to block a defined sum as loan collateral. That blocked money is then unblocked digressive with the payment off of the loan.

4.2.4 IP and IC Royalty securitization

If a company has fix revenues that are generated from IC or IP assets, the company could use their own royalties as collateral and thereby saving money by not having to pay the security fee on the innovation warranty fund. Securitizations allow companies to grant a security interest in a particular revenue stream, whether current or

prospective.¹⁰⁷ In recent years, royalty-funding arrangements, especially in the pharmaceutical and biotechnology sectors, were increasingly useful as sources of securitizations abroad. These arrangements range from straightforward securities in royalty streams, already cash flow positive (“royalty interest”), to more complex and risky investments in prospective future revenues from products, which are still in the premarket/pre-commercial stages (“revenue interest” or “synthetic royalty” transactions).¹⁰⁸

Figure 29: IP Royalty securitization



Source: Own draft

Companies that have tradable IP can use that method. For IC, this approach is only possible if the IC generates royalties that are fixed in a contract. This agreement is important for banks to recognize and measure the time and value of the IC royalty. The “royalty interest” securitization permits a company to give the rights or a percentage of the rights as a warranty to a financial institute while still retaining the rest for future royalty revenues.

During a certain time, the cash flow from IP flows as collateral in the credit. This financing vehicle takes the securitization of the royalty revenue stream and collateralizes it for a loan rather than selling the rights.

The “revenue interest” securitization model follows the same structure but is simply executed earlier in the life of the patented or copyrighted entity, for the purposes of this definition before the royalties have generated any revenue.¹⁰⁹ In that model, the bank

¹⁰⁷ Cf : <http://www.athenaalliance.org/apapers/MaximizingIntellectualPropertyandIntangibleAssets.htm> 30/09/2014

¹⁰⁸ Cf : <http://www.athenaalliance.org/apapers/MaximizingIntellectualPropertyandIntangibleAssets.htm> 29/09/2014

¹⁰⁹ Cf : Expert Group on Intellectual Property valuation, Final Report 29th November 2013 p.24

relates the income, or part of the income till a certain level of financial security is achieved. To use this approach, a company has to work with IP or intangibles that already generates an income.

Both the royalty and revenue interest models allow a financial institute to use future cash flows from an asset or group of assets to receive upfront payments companies in exchange for loan security. The bank gradually builds up its collateral from IP royalties or IP and intangibles revenues.

The choice of one precise method depends on the maturity of a company. Young start-up who doesn't generate revenue with IP or IC is more likely to tend to an innovative or warranty fund solution. Already established companies would perhaps tend to royalty or revenue-backed solution.

Nevertheless, Luxembourg has a gap when we talk about alternative funding solution. The author believes that only new funding opportunities in collaboration with financial institutes, the public and the private sector could make the innovation location Luxembourg attractive for companies and not glossy brochures and empty promises from the government.

5 Conclusion

Tomorrow's world will for sure be different from the world of today. The demographics and the compositions of the population are changing, the globalisation is continuing to influence the world, our lifestyles are developing, our regulatory surrounding is altering and our work environment will change dramatically. According to these impacts, Luxembourg will be pull out of their comfort zone.

Migrating from an economy that is based on tangible assets to an economy that is based on intangible assets needs more than only good promotion and infrastructure. One important factor for innovative- and R&D-based companies is the funding opportunities for such businesses. Without money, the idea of becoming a knowledge hub is unrealizable.

According to this problem, the author tries to make those intangibles, tangible by calculating the worth of such intangibles; the access to money and funding opportunities is possible. Aim of the thesis is to show the vulnerabilities of the Luxembourgish model. The fact that Luxembourg doesn't include the financial institution in the development of the innovative business hub is for the author a flaw. IC and IP will generate in the future the most important value of companies and could create a win-win situation for the innovative businesses, the government and the financial institution.

One of the most important businesses in the future is to understand the particularities of tangible, IP and IC assets. Understanding the value of intangibles is a main condition for a funding opportunity for such innovative companies. The author believes that intangibles are becoming more and more important for the value of an innovative company in a fast developing and tightly networked society. Recognizing, capturing and making IP and IC visible remains a challenge. Therefore, valuation is an important source of information and alternative approaches has to be developed rapidly.

Referring to Luxembourg, the government is until today bothered in legal and tax issues considering IP and neglects the economic importance of intangibles related to intellectual capital. The aim should be to connect financial institutions; governmental establishments and innovative companies to create a market orientated financial solutions.

The funding opportunities of those innovative companies should be a chance for

financial institutions to re-orientate their business areas. Nevertheless, it is the responsibility of the Luxembourgish banks and government to create alternative funding possibilities. In case those funding possibilities cannot be implemented as soon as possible, the risk that Luxembourg is losing its appeal as a location for innovation and R&D is high. This would have fatal consequences in today's global world such as loss of such businesses and their migration abroad. That would mean the loss of IC capital and the implication of a giant step back in the economic development.

In conclusion, the author is of the opinion that innovation is Luxembourg's next economic engine. We do not have any other short-term alternatives. Therefore, everyone should jointly pursue this same target of becoming an intangible hub in the centre of Europe. In accordance, we have to change people's opinions and sentiments about IP and IC assets as driver for our future economic growth.

The financial institutions, on their part have to understand that innovation is also their future business area. By making the worth of IP and IC calculable, banks can have the opportunity to finance such innovative companies and create a win-win situation for themselves (future revenues), for the innovative businesses (funding) and for the Luxembourgish economy (creating jobs).

Why not, being a worldwide forerunner in this market segment of IP and IC?

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7 Appendix

Appendix 1: Calculation of the RIV example (Excel)

[illegible]

Appendix 2: The calculation of the value of intangible basket on the example of “Labour skills” and “Corporate Culture”

Labour skills (Know-How / Educational level)

Intangible	Consistence of the intangible	Value
Know - How	Is enough trained staff available	300.000 EUR
Educational Level (graduate, Bachelor, Master)	What level of education have the collaborators / Are the responsibilities adapted to the level of education	400.000 EUR
Employee turnover	How often change the staff /terminations	100.000 EUR
Employee reference	Are employees involved in internal process design / Suggestions from employees	50.000 EUR
Etc...	
Total	 EUR

Corporate Culture

Intangible	Consistence of the intangible	Value
Innovation and Risk Taking	Degree to which employees are encouraged to be innovative and to take risk	300.000 EUR
Stability	Degree to which organizational decisions and actions emphasize maintaining status quo	400.000 EUR
People orientated	How often management decisions take into account the effects on people in the organization	100.000 EUR
Etc...	
Total	 EUR

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