Innovation & Internationalization

Fostering global competitiveness through a local vibrant ecosystem

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Contents

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List of Acronyms

3P	Posture, Propensity and Performance
AANZFTA	ASEAN-Australia-New Zealand Freed Trade Agreement
ACPFG	Australian Centre for Plant Functional Genomics
ABS	Australian Bureau of Statistics
AEC	ASEAN Economic Community
AMBC	Australia Malaysia Business Council
APBSD	ASEAN Policy Blueprint for SME Development
APEC	Asia-Pacific Economic Cooperation
ARF	ASEAN Regional Forum
ARI	Adelaide Research and Innovation
ASEAN	Association of South East Asian Nations
AUSFTA	Australia-United States Free Trade Agreement
Austrade	Australian Trade Commission
BASIC	Brazil South Africa India China
BER	Business Environment Ranking
BERD	Business Expenditure on R&D
BLEU	Belgium-Luxembourg Economic Union
BRIC	Brazil Russia India China
BRICS	Brazil Russia India China South Africa
CANATA	Canada-Australia Trade Agreement
C-D	Competence-Difference

C3	Co-opetition Co-specialization Co-evolution
CII	Composite Innovation Index
CIP	Competitive Industrial Performance
CNOOC	China National Offshore Oil Corporation
COALAR	Council on Australia-Latin America Relations
CRC	Cooperative Research Centre
DI	Double “I” (Innovation and Internationalization)
DIE	Double “I” Environment
DOI	Degree of Internationalization
EAS	East Asia Summit
EC	European Commission
ECIC	Entrepreneurship Commercialisation and Innovation Centre
EE	Emerging Economies
EIU	Economist Intelligence Unit
ERA	Excellence in Research for Australia
ERIA	Economic Research Institute for ASEAN and East Asia
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FDIC	Federal Deposit Insurance Corporation
FED	Federal Reserve
FFIEC	Federal Financial Institutions Examination Council
FTAAP	Free Trade Area of the Asia-Pacific

FTW	Finance Transportation Warehouse
Go8	Group of Eight
GDP	Gross Domestic Product
GERD	Government Expenditure on R&D
GII	Global Innovation Index
GNH	Gross National Happiness
IA-CEPA	Indonesia-Australia Comprehensive Partnership Agreement
IBSA	India Brazil South Africa
IBEF	India Brand Equity Foundation
ICT	Information Communication Technology
IFI	International Financial Institution
IMD	Institute for Management Development
IT	Information Technology
ILO	International Labour Organization
IVP	Innovation Voucher Program
IMF	International Monetary Fund
JAEPA	Japan-Australia Economic Partnership Agreement
JTC	Joint Trade Committee
M&A	Merger and Acquisition
MABC	Malaysia Australia Business Council
MAFTA	Malaysia-Australia Free Trade Agreement
MDB	Multilateral Development Bank

MFTZ Manaus Free Trade Zone

MES Minimum Efficient Scale

mMNC micro-Multinational Company

MNC Multinational Companie

NARA Nippon-Australia Relations Agreement

NCUA National Credit Union Administration

NGO Non-Governmental Organization

NICTA National ICT Australia

NSi Network Spread index

NVI New Venture Institute

OCS Organizational Cognition Spiral

OECD Organization for Economic Cooperation and Development

R&D Research and Development

RECEP Russian-European Centre for Economic Policy

ROD Real Option Driver

SA South Australia

SAFTA Singapore-Australia Free Trade Agreement

SAJMC Singapore-Australia Joint Ministerial Committee

SAPASD Strategic Action Plan for ASEAN SME Development

SARDI South Australian Research and Development Institute

SAS Strategic Asset Seeking

SBIR Small Business Innovation Research

SKARSE Strategic Knowledge Arbitrage and Serendipity

SME	Small and Medium Enterprise
ST	Science Technology
STEM	Science Technology Engineering and Mathematics
STI	Science Technology Innovation
T-TIP	Transatlantic Trade and Investment Partnership
TAFTA	Thailand-Australia Free Trade Agreement
TFAP	Trade Facilitation Action Plan
TH	Triple Helix
TNC	Transnational Company
TNi	Transnationality index
TSi	Transnationality Spread index
TPP	Trans-Pacific Partnership
UAE	United Arab Emirates
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational Scientific and Culture Organization
UNHCR	United Nations High Commissioner for Refugees
UNIDO	United Nations Industrial Development Organization
UniSA	University of South Australia
UNSW	University of New South Wales
US	United States

USA	United States of America
USITC	United States International Trade Commission
VC	Venture Capital
WIR	World Investment Report
WB	World Bank
WHO	World Health Organization
WTO	World Trade Organization
YEA	Young Entrepreneurs Alliance

Note:

While every effort has been taken to verify the accuracy of this information, we cannot accept any responsibility or liability for reliance by any person on this report or any of the information, opinions or conclusions set out in this report.

INTRODUCTION

Innovation and internationalization are both practices that date back many years in the past. The very first concepts of innovation can be found in the first inventions made by human beings thousands of years ago in order to survive. Humans kept innovating during history as a normal activity in order to improve their living standards, to facilitate work and as a natural consequence of their curiosity towards the unknown. However, the concept of innovation in economic terms came only from the last century and it is considered mostly due to the contribution of the Austrian economist, Joseph Schumpeter. The development of technology and science in the last century has been outstandingly fast. The World moved from the first samples of car to the first human on the moon in 83 years. From the floppy disk with a capacity of merely 1MB to external hard disks with capacity in the order of terabytes in less than 30 years. What most people are not realizing is that all these innovations are constantly shaping our society, behaviour and culture. In the book '*The Rise of the Creative Class*', Richard Florida makes a mental experiment of moving two hypothetical men, one from the year 1900 to 1950s and the other one from 1950s to nowadays. At a first glance it appears that the first man is the one that is experiencing the most traumatic change, however after a deeper analysis, it is the second time traveller who will notice the biggest differences. Not in terms of technological development probably, but as a sub-effect on the social and cultural dynamics.
On the other hand, internationalization is a concept that like innovation could be linked easily with our ancestors. With the development of *innovations*, such as a more robust ship, romans started to trade with other regions overlooking the Mediterranean Sea. With the increasing discovering of new lands and countries, the idea of trade began to arise even as a full time job. Recently people, goods, resources and capital are able to move all around the world contributing to the phenomenon called globalization. This ongoing process is increasing interconnections between all markets within and outside the boundaries of a country. Nowadays there is a growing interest in understanding the add value generated by these two aspects approached simultaneously. By understanding deeply the two phenomena there is the real possibility of addressing the two issues together in order to exploit all the possible synergies. This report highlights how innovation and internationalization practices are today strongly interconnected and why a policy maker, that supports a systematic approach addressing both simultaneously, will likely enjoy a growing local socio-economic development.

The first chapter of the report will analyse the global business environment in order to set the conditions on which all the further analysis will be done. Relying on the Business Environment Rankings developed by The Economist Intelligence Unit's, an outline of the evolution and latest trends in the global landscape will be presented. That ranking is designed to represent the main criteria used by companies to set up their global business strategies, and is based not only on its historical conditions but also on expectations about the prevailing circumstances over the next five years.

Chapter 2 presents Innovation and internationalization as the main aspects underlying nowadays economy and sets the basis for a double 'I' environment approach. The double 'I'

stands for Innovation and Internationalization, because by putting together these two mentioned key factors in one equation system, there is the possibility to undertake a virtuous process of socio-economic growth. The report will analyse those two main economic growth drivers in terms of measurement, models, latest trends and policy implication. The two 'I' components are expected to influence each other and together generate an exponential path of growth for the region able to implement them. This chapter represents a crucial point in the development of the whole report, as the following chapters will deal with different business agents by analysing them under a double 'I' perspective. The second chapter also provides an overview on the entrepreneurship and innovation ecosystem as a fundamental aspect to understand in order to create a vibrant local ecosystem.

One of the most important business agents in terms of employment, GDP and value added are the Small and Medium Enterprises (SMEs). Following the logic previously introduced, the third chapter will present an analysis of the SMEs sector in terms of innovation and internationalization. These companies account to almost 60% of the private sector employment and represent 95% of the total number of enterprises all over the world. However, in order to maximize the impact of such companies on the world economy they need support to overcome all the issues related to their small size. Nowadays SMEs (excluding nano-enterprises) are increasingly engaged in innovative activity of their products and processes, involving local stakeholders of the innovation ecosystem. At the same time SMEs are involved in international practices in order to penetrate new market. A review of SMEs' performance, opportunities and threats under a double 'I' environment will be provided.

Chapter 4 deals with Multinational Companies (MNCs) as actors where international and innovation components are strongly embedded. For example Siemens, with headquarters in Germany, has offices, research and manufacturing centres all over the world. It is investing more than €4.2 billion in R&D yearly spread among several countries, including USA, EU, Japan, China and Singapore. They are completely different when compared to SMEs, as they do not need direct support, even if a crucial role can still be played by an enabling environment. The most performing MNCs in terms of R&D are presented following the EU R&D Scoreboard, which studied the world R&D capabilities extensively. Then under an international perspective are reported all the latest trends in terms of FDI from the World Investment Report developed by the United Nations Conference on Trade and Development (UNCTAD). In addition to these features, in order to further stress the importance of MNCs in the business environment, attention will be also given to the potential cooperation between MNCs and SMEs.

The last chapter will analyse South Australia's (SA) performance under the conditions of a double "I" environment approach. It firstly presents the ten economic priorities set by the Premier J. Weatherill last August and then develops all the aspects of SA concerning innovation and internationalization. All the activities undertaken by the government in order to support initiatives in those two fields, show that the double 'I' approach has already been implemented in the region to some extent**.**

CHAPTER 1

GLOBAL BUSINESS ENVIRONMENT: EVOLUTION AND LATEST TREND

1.1 OVERVIEW OF THE GLOBAL BUSINESS ENVIRONMENT

The business environment is changing: emerging markets are reaching economic power and visibility, while already developed economies have to face several challenges in order to renew themselves. BRIC [1] countries surprise the world with their high growth rate and fast development path. Goldman Sachs' projections forecast that BRIC economies will be among the top 5 economies in the world in 2050. Accordingly, for the first time ever, in 2012 the global share of foreign direct investment (FDI) inflows towards developing countries is higher than the ones directed to developed economies. Furthermore multinational companies (MNCs) based on emerging economies are increasing their FDI outflows. These outflows are not only directed to other developing economies but they are increasingly investing in the high-knowledge industrial sector in advanced economies. Multinational companies from emerging markets are driven by asset-seeking motivations: they need to access technology, research and development (R&D) and marketing capabilities, know-how, brands, skilled human capital and the managerial and organizational competencies that they lack. So, on one hand advanced countries have growing opportunities to enjoy inflows of resources from emerging economies and to take advantage of their specific knowledge characteristics but, on the other hand, future competition will be harder because emerging economies like India, China and Brazil, are massively increasing the resources devoted to Science and Technology aimed at becoming innovation-oriented societies in the next 15 years. For this reason, globalization offers and will offer opportunities, but entails also threats, with a renewed perspective of competition for advanced economies. However, to keep high competition levels, it is necessary to understand the most powerful leverages for a country/region in order to be able to attract FDI, especially high-knowledge intensive FDI, and empower local growth of small and medium enterprises (SMEs) and startups through innovation and internationalization practices and their potential benefits.

1.1.1 BER: OUTLINE OF THE BUSINESS ENVIRONMENT MODEL

The Business Environment Ranking (BER) measures the attractiveness quality or the business environment attractiveness in the 82 countries covered by The Economist Intelligence Unit's Country Forecast reports. It is designed to represent the main criteria used by companies to set up their global business strategies, and is based not only on its historical background but also on expectations about the prevailing circumstances over the next five years. This allows the Economist Intelligence Unit to exploit the regularity, depth and detail of its forecasting work to generate a unique set of forward-looking business environment rankings on a

[1] Brazil, Russia, India and China

regional and global basis. The business rankings model examines ten separate categories, including:

1. political environment;
2. macroeconomic environment;
3. market opportunities;
4. policy towards free enterprise and competition;
5. policy towards foreign investment;
6. foreign trade and exchange controls;
7. taxes;
8. financing;
9. the labour market;
10. infrastructure.

Each category is based on a number of indicators that are evaluated by the Economist Intelligence Unit (EIU) for the last five years and the next five years. The number of indicators in each category ranges from five (foreign trade and exchange regimes) to 16 (infrastructure), and there are 91 total indicators. Each of the indicators is scored on a scale from 1 to 5 (from very bad for business to very good for business). Almost half of the indicators are based on quantitative parameters (like GDP growth), and are mostly drawn from national and international statistical sources for the historical period (2009-13) and from Economist Intelligence Unit assessments for the forecast period (2014-18). The other indicators consist of qualitative features (like quality of the financial regulatory system), and are drawn from a range of data sources and business surveys adjusted by the Economist Intelligence Unit, for 2009-13. All forecasts for the qualitative elements covering 2014-18 are based on Economist Intelligence Unit assessments.

TABLE 1.1: BUSINESS ENVIRONMENT RANKING 2013

Country	Score 2009-2013	Ranking 2009-2013	Score 2014-2018	Ranking 2014-2018
Singapore	8.56	1	8.65	**1**
Switzerland	8.41	2	8.52	**2**
Hong Kong	8.34	3	8.39	**3**
Canada	8.15	7	8.3	**4**
Australia	8.18	5	8.29	**5**
Sweden	8.2	4	8.26	**6**
USA	8.02	8	8.25	**7**
New Zealand	7.99	11	8.18	**8**
Finland	8.16	6	8.18	**9**
Denmark	8.01	9	8.16	**10**
Norway	7.89	13	8.01	**11**
Germany	7.99	10	7.98	**12**
Chile	7.81	14	7.89	**13**
Taiwan	7.68	16	7.85	**14**
Ireland	7.3	20	7.79	**15**
Netherlands	7.94	12	7.78	**16**

Belgium	7.69	15	7.69	**17**
Austria	7.61	17	7.62	**18**
Malaysia	7.15	24	7.56	**19**
Israel	7.17	23	7.5	**20**

Source: *Business Environment Ranking 2013*. The Economist Intelligence Unit.

The Economist Intelligence Unit affirms that, despite the potential of emerging markets, developed economies in North America, Western Europe and Asia remain the best places to do business according to its latest Business Environment Rankings. Singapore remains the world's most investor-friendly location in 2014-18, retaining its first position from the previous period. Switzerland and Hong Kong defend their second and third place position too. The rest of the top ten is dominated by North America, Scandinavian countries and other developed Asian economies.

Asia (including Australia and New Zealand) is a varied region since there are strong differences between the overall scores and global rankings of its top four countries (Singapore, Hong Kong, Australia and New Zealand) and its poorest performers (Bangladesh in 69th and Pakistan in 74th place, out of the 82 countries ranked). The gap reflects the widely varying levels of economic development and political stability between these countries and the sharp differences in the underlying structure shaping laws and regulations of foreign investment. Asia's best performers have several key factors in common: a favourable policy environment (especially for finance and foreign investment) with competition policies encompassing international best practice.

In East Asia, competition between cities to become hubs for international finance, manufacturing and logistics has brought significant improvements in the business environment. Despite tensions in some countries over immigration from poorer neighbours, migration of skilled workforce within Asia will remain relatively unhindered and overall labour market conditions will keep resulting extremely favourable compared to other regions, with companies able to expand or reduce their workforce easily, as well as benefitting from freedom to set wages and hire foreign nationals. Infrastructure remains a relative weak point for Asia, with only Singapore ranking among the world's top 10 in this category (compared with other areas of the business environment, faring relatively poorly, in 7th place). Australia, Japan and New Zealand trail in joint 14th place, with Hong Kong coming in at 18th. There is excellent infrastructure, particularly telecommunication and air transport, but other areas require investment to improve distribution networks and utilities provision, as well as lower office rents.

1.1.2 AUSTRALIA

Doing business in Australia is easy especially given its solid economic credential and positive outlook for growth mainly due to its high-skilled labour force and R&D capabilities, which are significantly raising opportunities for investing. Among its most attractive feature, its debt securities market, amounting to almost US$2 trillion, remains the third largest in the Asian region (after Japan and China).

TABLE 1.2: International and domestic debt securities 2013 (Austrade, 2014)

Japan	**US$13,097 Billion**
China	**US$ 4,027 Billion**
Australia	**US$ 1,913 Billion**
South Korea	US$ 1,538 Billion
India	US$ 618 Billion
Malaysia	US$ 364 Billion
Taiwan	US$ 334 Billion
Thailand	US$ 296 Billion
Singapore	US$ 206 Billion
Indonesia	US$ 154 Billion
Philippines	US$ 134 Billion
New Zealand	US$ 82 Billion

Source: Bank for International Settlements, Quarterly Review, September Review, Table 11A and Table 16A (released 9 March 2014); Austrade.

In spite of its slight decrease, Australia has ranked third on the Index of Economic Freedom [2](for six years in a row), which asserts that its "*openness to global trade and investment is firmly institutionalized, supported by a relatively efficient entrepreneurial framework and a well-functioning independent judiciary*".

TABLE 1.3: Index of World Economic Freedom 2014

(Score of 2014 and variation compared to 2013)

1	Hong Kong	90.1	**+0.8**
2	Singapore	89.4	**+1.4**
3	Australia	82.0	**-0.6**
4	Switzerland	81.6	+0.6
5	New Zealand	81.2	-0.2
6	Canada	80.2	**+0.8**
7	Chile	78.7	-0.3
8	Mauritius	76.5	-0.4
9	Ireland	76.2	+0.5
10	Denmark	76.1	0.0
11	Estonia	75.9	+0.6
12	USA	75.5	**-0.5**
13	Bahrain	75.1	-0.4
14	UK	74.9	+0.1
15	The Netherlands	74.2	+0.7
16	Luxembourg	74.2	0.0
17	Taiwan	73.9	**+1.2**
18	Germany	73.4	+0.6
19	Finland	73.4	**-0.6**
20	Sweden	73.1	+0.2

Source: *Index of the World Economic Freedom 2014.* The Wall Street Journal and the Heritage Foundation.

[2] The Index of Economic Freedom is an annual index and ranking created by The Heritage Foundation and The Wall Street Journal in 1995 aimed to measure the degree of economic freedom in the world's nations.

As reported by the World Economic Forum, Australia's political stability and regulatory framework provide investors with confidence and security, especially with one of the most transparent and well-regulated business environments in the world. Specifically, it retains high spots concerning legal rights, ease of setting up a business and banking soundness. In addition, according to IMD [3] (Switzerland), Australia has one of the lowest financial risk factors in the world and the fourth most efficient finance and banking regulatory system.

[3] The Institute for Management Development is one of the world's premier business and management institutions.

TABLE 1.4: Global Competitiveness Report 2013-2014

	Australia	USA	UK	China	Japan	South Korea	India	Hong Kong	Singapore
Legal Rights Index	**=1**	13	=1	65	42	28	28	=1	=1
Time required to start a business	**2**	16	63	112	95	25	103	=5	=5
No. of procedures to start a business	**3**	=47	=47	135	88	30	129	=10	=10
Efficacy of corporate boards	**7**	15	21	84	19	130	65	17	5
Financing through local equity market	**8**	5	12	38	16	75	18	1	7
Soundness of Banks	**9**	58	105	72	43	113	49	4	5
Country Credit Rating	**10**	12	15	23	18	22	47	14	4
Regulation of Securities Exchange	**11**	30	24	63	29	94	27	4	5
Intensity of local competition	**13**	14	3	46	1	8	24	7	19

Source: World Economic Forum, Switzerland and Harvard University, Global Competitiveness Report 2013–14.

TABLE 1.5: World Competitiveness Yearbook 2014

	Australia	USA	UK	China	Japan	South Korea	India	Hong Kong	Singapore
Finance and Banking Regulation	**4**	21	37	40	29	55	26	6	3
Financial Risk Factor	**4**	27	43	48	19	52	44	6	5
Protectionism	**5**	17	8	47	22	48	41	10	21
Auditing and Accounting Practices	**7**	10	21	55	33	59	43	16	4
Corporate Boards	**8**	26	22	34	41	58	40	15	3
Competition Legislation	**7**	14	8	47	6	32	36	29	12
Corporate Debt	**7**	8	15	43	20	53	30	10	12
Shareholders' rights	**9**	10	16	54	43	56	43	18	15

Source: IMD, Switzerland, World Competitiveness Online (1995–2014)

In addition, Australian governance quality ranks among the best in the world representing a key factor to economic growth and security.

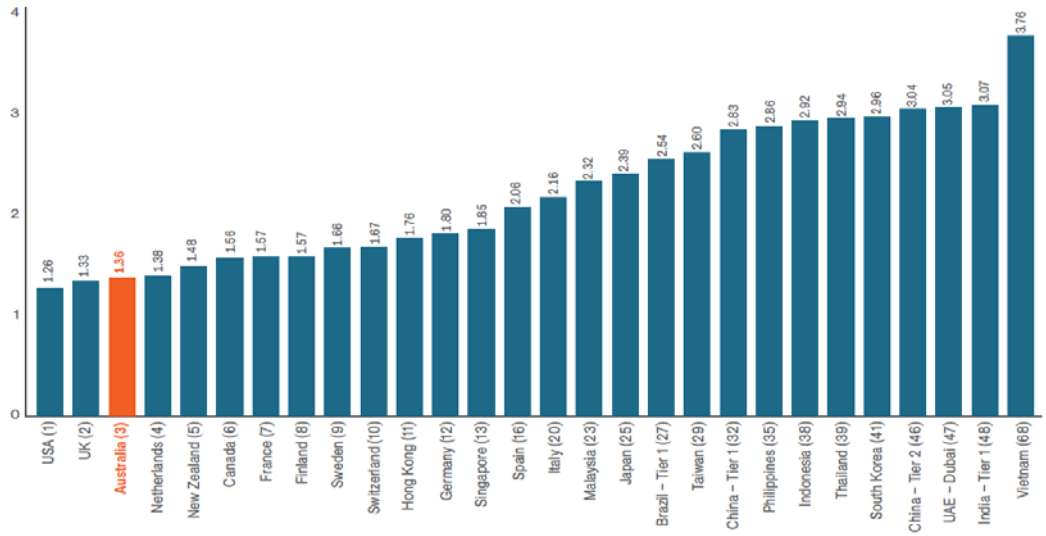
TABLE 1.6: Worldwide Governance Indicators

		Regulatory Quality	*Voice and Accountability*	*Control of Corruption*	*Rules of Law*	*Government Effectiveness*	*Political Stability*
1	Finland	98.1	96.7	98.1	99.5	**100.0**	97.6
2	New Zealand	98.6	98.1	99.5	98.6	96.2	97.2
3	Sweden	**99.0**	99.5	99.0	99.1	98.6	90.0
4	Switzerland	95.2	98.6	97.6	96.7	97.6	98.1
5	Norway	91.9	**100.0**	98.6	**100.0**	98.1	93.8
6	Luxembourg	96.7	97.2	96.2	96.2	94.7	96.2
7	Netherlands	96.2	97.6	96.7	97.2	96.7	90.5
8	Denmark	97.6	99.1	**100.0**	98.1	99.0	**74.9**
9	Canada	95.7	94.3	95.2	95.3	95.2	88.2
10	**Australia**	**97.1**	**96.2**	**95.7**	**94.8**	**94.3**	**80.6**

Source: *Worldwide Governance Indicators 2013*. The World Bank (2013 Update); Austrade.

As shown by the composite index (*Jones Lang LaSalle, LaSalle Investment Management, Global Real Estate Transparency Index, Global Foresight Series 2012*) below, Australia has a sophisticated financial sector that offers access to the world's third largest pool of investment funds and one of the region's largest pools of bank assets. More than 18,000 foreign companies are registered in Australia, including 18 of the Top 20 FT Global 500 companies and eight of the Top 10 fortune 100. Its real estate market is particularly attractive given its significant level of transparency. The index includes five sub-indices: Performance Measurement, Market Fundamentals, Governance of Listed Vehicles, regulatory and Legal, and Transaction.

FIGURE 1.1: GLOBAL REAL ESTATE TRANSPARENCY – COMPOSITE INDEX – 2012



Source: *Jones Lang LaSalle, LaSalle Investment Management, Global Real Estate Transparency Index, Global Foresight Series 2012*

Australia is also ranked fifth (out of 62) by the latest Financial Development Index of the World Economic Forum (World Economic Forum, 2012) whose top ten spots are reported below.

TABLE 1.7: Financial Development Index

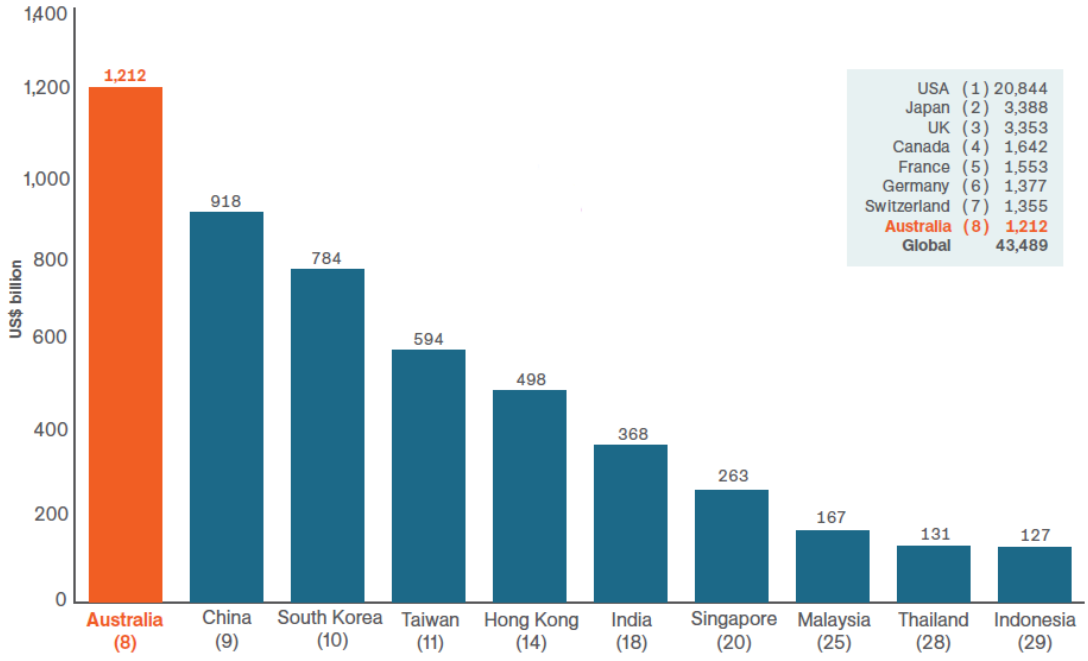
	Overall	*Non-Banking Financial Access*	*Financial Access*	*Banking Financial Services*	*Financial Markets*	*Financial Stability*	*Financial Environment*	*Institutional Environment*
Hong Kong	1	10	4	1	4	8	2	9
USA	2	1	5	21	1	38	13	13
UK	3	3	12	2	2	43	8	2
Singapore	4	12	14	10	3	3	1	1
Australia	**5**	**5**	**6**	**7**	**8**	**9**	**12**	**18**
Canada	6	7	2	13	10	13	9	6
Japan	7	6	27	3	5	19	19	15
Switzerland	8	15	24	16	7	2	6	12
Netherlands	9	13	13	4	17	16	7	7
Sweden	10	32	1	8	15	25	10	4

Source: *The Financial Development Report 2012*, World Economic Forum (released 31 October 2012); Austrade.

An additional relevant strength is given by its investment and cultural ties with the fast-growing Asia-Pacific area. Australia is home to the largest liquid stock market in the Asian region outside Japan (Austrade, 2014).

FIGURE 1.2: SIZE OF KEY STOCK MARKETS IN ASIA

Market capitalisation of free-floating stocks (US$ billion, 30 April 2014)



Source: *Why Australia Benchmark Report June 2014 Update.* Australian Trade Commission, Australian Government.

1.1.3 ASEAN

The South East Asian business environment has been increasingly characterized by three key factors: rising regional integration, growth, and rapid urbanization. These particularly raise demand for investment in infrastructure as well as demand for food and energy supply. Economic growth and industrial modernization is leading to increasing demand for skills development, innovation, technology and services. There is also potential demand for improved health care services and goods and services that contribute to high quality of life - tourism, entertainment and leisure activities, ICT and more sophisticated consumer goods.
The West was once considered the world hub of knowledge, economy and culture.

As described in the article by Prof. Italo Trevisan and Adj. Prof. Nicola Sasanelli, today the East represents a new hub, not only from the point of view of the growing population, but also because of the economic liveliness this area is experiencing. According to OECD data the Gross Domestic Products (GDPs) growth of Southeast Asia, China and India will increase over the period 2014-2018 on average by 6.9% (China and Laos are expected to record the greatest growth with 7.7%) (OECD, 2013). Even if the growth slowed down, Asia remains the strongest of the world. This would move the economic and cultural hub of the Atlantic Ocean (the West), as it was considered in the last few years, toward the Pacific Ocean (the East), which is likely to be recognised as "the sea of the future": the new centre of economy, culture, science and technological knowledge.

In particular, the ten ASEAN[4] countries are working hard to achieve integration, unity and economic prosperity. However, there is considerable economic, political and cultural diversity amongst member states, since the region includes countries at very different stages of development. In fact, standard deviation in average incomes among the ASEAN countries is more than seven times that of EU member states. Singapore is significantly the wealthiest nation with a GDP per capita of US$51,700 (the 12th highest in the world). Indonesia (5.4% in 2014), Malaysia (5.2% in 2014) and Singapore (3.6% in 2014) are expected to grow considerably over the next five years, according to the International Monetary Fund forecasts about annual growth in GDP (percentage). The whole ASEAN region is predicted to grow at 5% a year.

[4] The Association of Southeast Asian Nations is a political and economic organization of ten countries located in Southeast Asia: Indonesia, Malaysia, the Philippines, Singapore, Thailand (founder countries), Brunei, Cambodia, Laos, Myanmar and Vietnam.

FIGURE 1.3: ASEAN

Source: *http://tompepinsky.com/2014/03/26/mh370-whats-up-asean/*

Moreover, the fastest and most significant changes are taking place in Myanmar, described as the "next Asian miracle" (Yasheng Huang, 2008). The country is facing a historic transformation which was given impetus with the 2003 Roadmap to Democracy, and gained momentum with the current government taking office in March 2011. The current administration is committing to reintegrating Myanmar into the global community and in 2014 its ASEAN peers enable Myanmar to assume the ASEAN Chairmanship role.

TABLE 1.8: Key statistics about ASEAN countries

Country	*Total Population*	*Nominal GDP PPP (2013)*	*Ave nominal GDP growth (2008-2013)*	*GDP per capita (2012)*
Singapore	**5.31 Millions**	**348.70Billions**	**4.08 %**	**US$51,709.45 Millions**
Brunei	0.41 Millions	21.69Billions	-1.24 %	US$41,126.61 Millions
Malaysia	29.24 Millions	525.70Billions	4.69 %	US$10,432.06 Millions
Thailand	66.79 Millions	673.73Billions	2.87 %	US$5,479.76 Millions
Indonesia	248.86 Millions	1,292.85Billions	5.78 %	US$3,556.79 Millions
Philippines	96.71 Millions	456.42Billions	7.16 %	2,587.02 US$Millions
Vietnam	88.77 Millions	359.80Billions	5.42 %	US$1,755.27 Millions

Laos	6.65 Millions	20.78Billions	8.20 %	US$1,417.08 Millions
Timor-Leste	1.21 Millions	25.77Billions	8.45 %	US$1,068.39 Millions
Cambodia	14.86 Millions	39.69Billions	7.02 %	US$944.41 Millions
Myanmar	52.8Millions	112.97Billions	7.50 %	US$875.90 Millions
Overall (total or average)	**609.61Millions**	**3,878.09Billions**	**5.45 %**	**US$10,995.70 Millions**

Source: *South Australia-South East Asia, Engagement Directions Paper*, 2014

1.1.4 BRICs

Brazil

Recently, Brazil's economic recovery has been significantly supported by relatively low export reliance, due to its large foreign reserves and sizable domestic market. The hosting of football's World Cup in 2014 and the Rio de Janeiro Summer Olympics has further boosted that process.

After recording encouraging growth in 2010 and early 2011, the Brazilian economy moderated in the second half of 2012 in line with the prolonged European debt crisis and the US economic uncertainty. The slackening commodity demand and industrial production, plus the slower inflow of foreign capital, cooled off the country's economic boom, leading to a much more humble growth of 3.8% in the whole of 2011.

In 2012 Brazil overtook the United Kingdom to become the sixth-largest economy in the world, with its GDP around US$2.2 trillion (due to exchange rate fluctuations, the UK and Brazil fluctuate between being the sixth and seventh-largest economies to date). Brazil's per capita GDP is lower than Chile's but higher than in fellow BRICS members, China and India.

Brazil's Manaus Free Trade Zone (MFTZ), is among the largest and most developed free trade zones in Latin America. Its status implies that goods of foreign origins may enter into Manaus without payment of customs or other federal, state or local import taxes. The procedures for importing goods into the MFTZ are similar to shipping to other points in Brazil, except that additional licences are required.

Progressive economic policies have rapidly turned Brazil into a sound economy with a political and fiscal environment favourable to growth. Currently, it offers one of the most promising investment properties across the world. Improved communication networks, and cheap direct flights from most European nations, have made Brazil one of the hotspots for not only the investors but also the tourists. Brazil has open trade relations with all countries. Moreover, it is one of the major exporters of agricultural products such as sugar, soybeans, corn and cotton whose development is expedited by well-developed technology and well-built infrastructure. Brazilian labour cost is relatively low ($450/month) and its population is characterized by a perfect mix of older and younger generation, which adds experience and energy respectively to its workforce.

Nevertheless, there are still some problems related especially with the development of the SMEs sector. In one statistical, it has study has emerged that the size of the SME sector is not positively associated with economic growth. This does not mean that SMEs should be discouraged in Brazil, but that the presence of institutional failures is a hindrance to the development of the sector. More productive entrepreneurs would provide an impetus for more human capital formation, calling for a governmental intervention. This is the reason why institutional improvement and educational policies should be the focus on the formation of more human capital in order to make the whole sector more productive. The results of the study do not support the view that SMEs should be supported directly to promote economic growth, thus the size of the SME sector should not be increased per se to promote growth (Cravoy, Gourlayy, and Beckery; 2009).

Russian Federation

Russia represents the eighth largest economy in the world. The major sector is the automotive market, which is particularly expected to further grow. Specifically, Russia is able to serve it even better. However, there are other main key sectors: innovation and technology, pharmaceutical, real estate market, and infrastructure.

The development of innovations and technology in Russia has been steadily becoming a strategic area for both the Russian government and private business. Infrastructure is one of the great challenges of the 21st century for Russia, with a huge impact on long-term business growth and economic competitiveness.

Russia is the eighth largest pharmaceutical market in the world (nearly 80% of products are imported). The Federal target programme aims to develop this sector by 2020 with the following objectives:

- the share of Russian manufactured medicines within the list of strategic and vitally important medicines must reach 90%;
- the share of local medical drugs in the pharmaceutical market in monetary terms must reach 50%;
- the share of local medical products and medical equipment in monetary terms must reach 40%;
- 75% of pharmaceutical and 85% of medical companies ought to be modernized.

Russia is seen as an attractive real estate investment market in 2014, especially compared to other European countries. In today's low yield environment in equities and fixed income instruments, as well as in banking deposits, real estate has become an attractiveness indicator. Russia has become significantly attractive for both local and foreign investors over the last few years, resulting in the closure of a number of US $1 billion deals between 2011 and 2013. This is unlikely to be repeated in the near future, especially in light of the Ukraine issue, but the market has clearly entered a new phase of development and growth.

Infrastructure is one of the great challenges of the 21st century for Russia, with a huge impact on long-term business growth and economic competitiveness. In spite of the

expected slowdown in Russia's economy's growth and the lingering economic crisis in Europe, most investors are optimistic about prospects of infrastructure development in Russia.

As briefly introduced before, a raising issue for this country could be related to Ukraine, with the EU and the US on one side and the Russian Federation on the other. Nowadays there are already in place some economic measures against the Federation, but if a truce is settled and will last, they have already said that they are ready to remove those measures. However, measures or no measures, a negative reflection of the Ukraine conflict over the trust of financial markets will be observable.

India

In 2012 India became the third largest economy in the world in terms of PPP and its economic performances. The Indian economy comprises activity ranging from IT to subsistence agriculture. After decades of failing to realise its full economic potential, India was one of the world's fastest-growing large economies throughout the early 2000s. Recently, however, growth has slowed and further economic reform is needed.

The crucial opportunity for India is provided by its demographic surplus. Its population growth rate is increasing more than that of China's and is expected to become the largest in the world by 2030. India is expected to make the largest addition to the global labour pool over the next decade with the contribution of at least 270 million people to the working-age population by 2030. In addition, engagement with the Indian diaspora is crucial. In fact, for instance, Indians living in the United States have been able affect their government's foreign policy towards India. Its rapid urbanisation is expected to bring a number of opportunities, including assisting with India's continuing and extensive efforts to attract foreign capital and in creating greater opportunities for more broad-based economic growth across the Indian population, as urbanisation diversifies the opportunities for wealth creation. India's economic growth provides a unique opportunity to lift millions of its citizens from below the poverty line into productive employment.

India can achieve social inclusion within the main purposes including making fuel and fertilisers more affordable, investing more in rural development, infrastructure, public health and education, and developing targeted programs to deal with malnutrition and food security. Furthermore, India has opportunities to augment its international influence through the exercise of soft power, as both the world's largest democracy and a burgeoning economic superpower. India is likely to use its economic importance, geostrategic military relevance as part of its foreign policy to fulfil its objectives at home and abroad. However, India must face key challenges in order to maximise these opportunities: improving integrity and transparency in public policy-making and business, ensuring homeland security, countering environmental degradation, and ensuring secure and clean sources of energy for the future. Finally it has to solve several problems affecting the education sector, especially university education, in order to create the future leading generations.

China

The Chinese economy, the world's second largest economy, is facing rapid changes. Thirty years ago its initial move to industrialisation was export-led. The 12th Five-Year Plan (FYP), which will run until 2015, has turned that focus into encouraging domestic consumption, addressing widening income and regional inequalities, and developing local innovation. Rapid urbanisation has lifted nearly 440 million people out of poverty. China's policy to shift its population from mainly rural to urban has generated the creation of new cities, infrastructure and development. Its population trends reflect the increasing importance of China's second-tier and third-tier cities. Moreover, the one-child policy is resulting in an aging population and rising dependency ratio. At present, 8.2% of China's population is over 65 years old and it will reach 26% by 2050. Consequently, demand for health-related services will rise. Disposable incomes in China have been rising for the past thirty years. Chinese middle class was not even present thirty years ago, today they are demanding better living conditions, making the improvement of the environment a priority for city planners. The new rich Chinese are looking for high-quality investment, education, leisure and products.

Within this changing framework, China has to meet several key challenges:

- achieving higher quality GDP growth;
- implementing prudent monetary policy;
- intensifying anti-corruption efforts;
- spending 2.2% of GDP on R&D by 2015;
- keeping population below 1.39 billion by 2015 and increasing urbanisation from 47.5 to 51.5%;
- limiting the increasing gap in income distribution and the rising cost of housing;
- encouraging foreign investment in modern agriculture, high technology and environment protection industries;
- enabling emerging strategic industries to account for 8% of GDP;
- strengthening the protection of intellectual property rights to support the development of home-grown technology and innovation;
- moving coastal regions from low-cost manufacturing to R&D, and high-end manufacturing and services;
- developing efficient and safe nuclear power;
- building large-scale hydroelectric power plants in the south west;
- extending the high-speed railway to reach 45,000 km and the highway network to reach 83,000 km;
- building 36 million affordable apartments for people with low incomes.

1.1.5 EUROPE

Europe remains off the top of the BER because of the keen impact of global crisis on economic and political stability and financing availability. Yet most of European countries represent relevant investment environments, dominating the rankings between 10th and 30th spot, due to a high degree of political stability and market openness to world trade.

Average scores for the macroeconomic environment are improving as fiscal deficit starts to narrow and average debt stock looks set to stabilize. However, the overall low score of political stability is due to the heavy cuts to public spending entailing social tension.

For several years, the onerous tax burden (higher than in any other region in the world) has been representing a significant factor affecting the European business environment.
Different European countries are trying to reduce non-wage labour costs since they represent a source of unemployment in many economies of the region. Most of them will be keeping reducing the burden of social security as well as income and corporate tax, compensating with an increase in indirect taxes (i.e. environmental taxes).

Switzerland is an open economy with one of the highest scores of life quality and one of the highest per capita incomes in the world, hinging on talented workforce and technological expertise in manufacturing as well as earnings from services such as tourism and banking. In 2012-13 Switzerland was ranked as the fourth most competitive country in the world (World Economic Forum) for the fourth year in a row.
Switzerland is keeping its second position in the ranking, especially given its importance as trading nation (A$29 billion trade surplus in 2013). It experienced the global crisis comparatively well thanks to various measures stimulating domestic demand helping to compensate for losses in the financial and export sectors. In spite of the Eurozone low growth and structural issues, Swiss economy has remained resilient thanks to its high degree of competitiveness.
Recent structural reform targeted to boost GDP growth over the long term (improving competition, social security reform and liberalising some expensive sectors) has been supporting Switzerland's continued economic strength.

Scandinavian countries result to perform particularly well, with Sweden (5^{th}), Finland (9^{th}) and Denmark (10^{th}) within the top ten of the BER, and Norway just after them (11^{th}). In fact, despite their modest economic size (whose GDP ranking ranges from 22^{nd} to 42^{nd} position), they have shown much more resilience, than most of the other European countries, to the crisis.

Germany (12^{th}) is the Europe's largest economy and the fourth globally, playing a crucial role within European economic strength. At the same time, an effective free-trade zone and robust demand in Europe is critical to German's thriving economy.

The Netherlands (16^{th}) is a small but wealthy trading nation, with a population of 16.8 million and the 18th largest economy in the world, playing a crucial role in the global response to the financial crisis with many of its ideas and measures picked up by the European Union and other countries.

The United Kingdom is the sixth largest economy in the world, but is only 22^{nd} in the BER. It was hard hit by the financial crisis of 2008 and more by the Eurozone crisis. Nonetheless, the economy is now well recovering (growth rate of 0.8% in the first quarter of 2014), unemployment rate has been reduced faster than how it was expected (down to 6.8% in the

three months to March 2014). Yet, its growth perspectives remain significantly constrained by recovery in the global economy and, in particular, in the EU (its largest export market). Britain's fiscal deficit is being reduced on the back of the Government's large fiscal consolidation program. The Government's economic strategy also includes growth measures, such as a cut to the corporate tax rate and increasing capital spending on infrastructure.

Lately, east European investment environment has been particularly improved, through factors such as low-cost qualified workforce, proximity to developed market and varied natural resources. Yet, most of them are still facing crucial political (reform) challenges after the significantly negative impact of crisis on this area, and just some of them are ranked relatively well within the BER (i.e. Hungary 37th).

1.1.6 NORTH AMERICA

The United States is still a crucial business destination since it is the world's largest economy (25% of global GDP) and it has been recovering faster than most of OECD countries from the crisis, through channels such as policies towards private enterprises and open and transparent competition. In particular, the US represents a key driver of the global economy and a world leader in terms of international trade and investment, R&D expenditure, stock market capitalisation and its share of large global corporations.
The US labour market is flexible and its overall level of infrastructure is solid, even though it needs strong investment in some areas. Financial markets have recovered their depth and liquidity, but are changing according to industry trends and new regulatory frameworks.
In spite of the challenges it is still facing, the US is included within the top ten of the BER given its seventh position (8th in the previous ranking), yet characterized by subindices ranging from excellent (market opportunities) to weak scores (financing, political stability, taxes).

Canada's score (4th) is up three positions compared to the previous period, granting a place within the top five of the BER, thanks to its excellent market opportunities, high-level GDP per capita (the 11th biggest economy in the world according to the IMF [5] 2013), strong trade flows and ample natural resources. Among the weaknesses, tax sector remain relevant given its complexity.
Moreover, Canada is ranked as the 14th most competitive nation economically among 148 countries (World Economic Forum) thanks to efficient goods, labour and financial markets, excellent infrastructure, and well-functioning and transparent institutions. It is also well performing in terms of investments, ranking itself among the top 10 investing and hosting economies in the World (see chapter 4).

[5] International Monetary Fund

CHAPTER 2

THE DOUBLE 'I' ENVIRONMENT AND A LOCAL VIBRANT ECOSYSTEM

Innovation does not just happen by chance. Most of the time when people are referring to the so called happy accidents, without knowing it, they are referring to inventions and not innovation. Innovation can be viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs (Maranville, 1992). It results crucial to productivity, growth and competitiveness; and it involves decisions made in both private and public sectors related to the investment of effort, money, and time in exploring new ideas. From a business viewpoint, profit and competition will be important drivers of innovation. Similarly, flexibility in the workplace and a regulatory environment can facilitate the adoption of new practices and processes.

Internationalization on the other hand is playing a crucial role by the increasing interconnection of all markets, within and outside the boundaries of a country. The increasing globalization process exposes most firms to review their business strategy from the internationalization perspective since it is becoming an important growth driver (for SMEs as well). Globalization is the process of international integration arising from the interchange of world views, products, ideas and other aspects of culture, but what is more important for this report is the so called economic globalization. The interdependence among different countries all over the world is a process that dates back over the last century, however only the recent developments of technologies allowed economies to rely on internationalization practices as a source of competitive advantage. The decrease of international trade regulations as well as tariffs, taxes, and other impediments that suppress global trade and the increasing presence of free trade areas/agreements have boosted economic globalization to an unprecedented level. However, it does not include unhindered movement of labor and, as suggested by some economists, may hurt smaller or fragile economies if applied indiscriminately.

This chapter deals with an analysis of both innovation and internationalization components as a part of a broader environment called Double 'I' environment. As will be explained in the two parts of this chapter, the role of innovation and internationalization practices is nowadays fundamental. The report will analyse those two main economic growth drivers in terms of measurement, models, latest trends and policy implication. The good results, from a policy maker perspective, of a supportive policy for innovation or internationalization are quite clear.

The environment called **double 'I'** (DI) puts together these two key factors in one equation system as it is very likely they will lead to economic growth and development, even in the global landscape, through a certain virtuous circle. The two 'I' components (innovation and internationalization), are expected to influence each other and together generate an exponential path of growth for the region able to implement them. The idea is that each one

taken alone, if supported and fostered adequately, will indirectly lead to the implementation of the other one as well. For instance, a region that, with its companies, starts to engage internationally with other countries; due to its efforts in internationalization may after a while enjoy innovation and knowledge spill overs from the counterpart. Vice versa, investing heavily in innovation will lead to some level of international engagement for R&D for example. Thus starting from this idea of interdependence, the Double 'I' environment suggests to support, foster and invests in both the components simultaneously in order to leverage on synergies and reach an exponential virtuous circle of socio-economic growth.

Some recent studies have identified empirically the presence of a correlation between innovation and internationalization. However, it is not possible from our evidence to draw inference on the direction of such correlation, because causality could go from innovation to internationalization or vice versa (Filippetti et al., 2011). Nevertheless, it is clear that the two aspects influence each other and taken alone they bring benefit for the socio-economic growth of the region.

Policy makers are already taking into account this correlation and based on that, they start thinking to implement a strategy in order to support the two 'I' simultaneously. This will enable the region/country to exploit the benefits they create alone and the more benefits they create thanks to the existence of a correlation among them. Moreover, once that the mechanism have started to work, they will not just create benefits but also reinforce each other on a mutual basis leading the whole economy to develop, grow and prosper on higher levels.

2.1 INNOVATION COMPONENTS FOR THE DOUBLE 'I' ENVIRONMENT

In order to achieve both strategic management and sustainable development outcomes, it is fundamental to understand the role of innovation in the double I environment and firm performance.
However, measuring a firm's innovation has not been given much attention by existing literature. Most studies focus more on the innovation process itself without deepening managers' behaviour aimed at mitigate risk and uncertainty. Existing studies have not provided a generally accepted indicator of innovation results.

Among the input indicators, which mainly measure the innovation sources, there is intellectual, human and technological capital (Carayannis et al.; 2003).
Process indicators aim at reflecting the innovation management system, while performance indicators investigate the results of the organisational innovation. Output indicators instead reveal the short term success of the innovative activities (patents). Outcome indicators represent the realized long term success of innovative activities, such as market share, firm growth rate and technological standards (ibidem).

Diverse studies employ a single input or output indicator to measure innovation performance, but they often come to measurement problems, especially about innovation

input (Coombss et al.; 1997), such as input measurements not embodying either process efficiency, technological complexity, or economic (or qualitative) value.

On the other hand, output indicators (based on patents) might present issues as well, since their technological level and economic value are highly heterogeneous, across countries and firm size (IPR are not recognized homogenously in every economy), and show limitations about comparisons with industry-level antecedents (Santarelli, and Piergiovanni; 1996).

Moreover, existing literature presents the following main limitations: too much emphasis on the manufacturing sector and product innovation, while ignoring process variables (Carayannis, and Provance; 2008). Accordingly, it is difficult to compare different situations (sizes, objectives, activities), and not enough attention has been paid to indicators for innovative success. Later works have found the use of multiple, or composite, indexes to be more suitable in assessing firm innovativeness since single or more limited indicators do not provide the degree of adjustment to a firm's innovation system that a manager needs (ibidem).

In particular, in order to cope with previous literatures' limitations in assessing how firms can affect their innovation capacity and resulting performance, Carayannis and Provance (2008) provide an innovation measurement, Composite Innovation Index[6] (CII), that simultaneously encompasses the "Posture", "Propensity", and "Performance" (3P) related to a firm's innovation capabilities. They recognize the importance of input, throughput, and output in measuring the performance implications of innovation. However, their work involves limitations, such as the limited sample employed, and they also have to consider how best to employ factor analysis and include an external measurement instrument for innovation-related performance of the firms like an expert rating. In fact, they do not mean to propose a unifying method for every situation but, rather, they attempt to show the importance of the CII and leave for future literature the identification of suitable consideration of the pertinent framework.
In the following paragraph, a detailed explanation of the Global Innovation Index is provided, which is an example of a suitable measure of the degree of innovativeness of a country/economy.

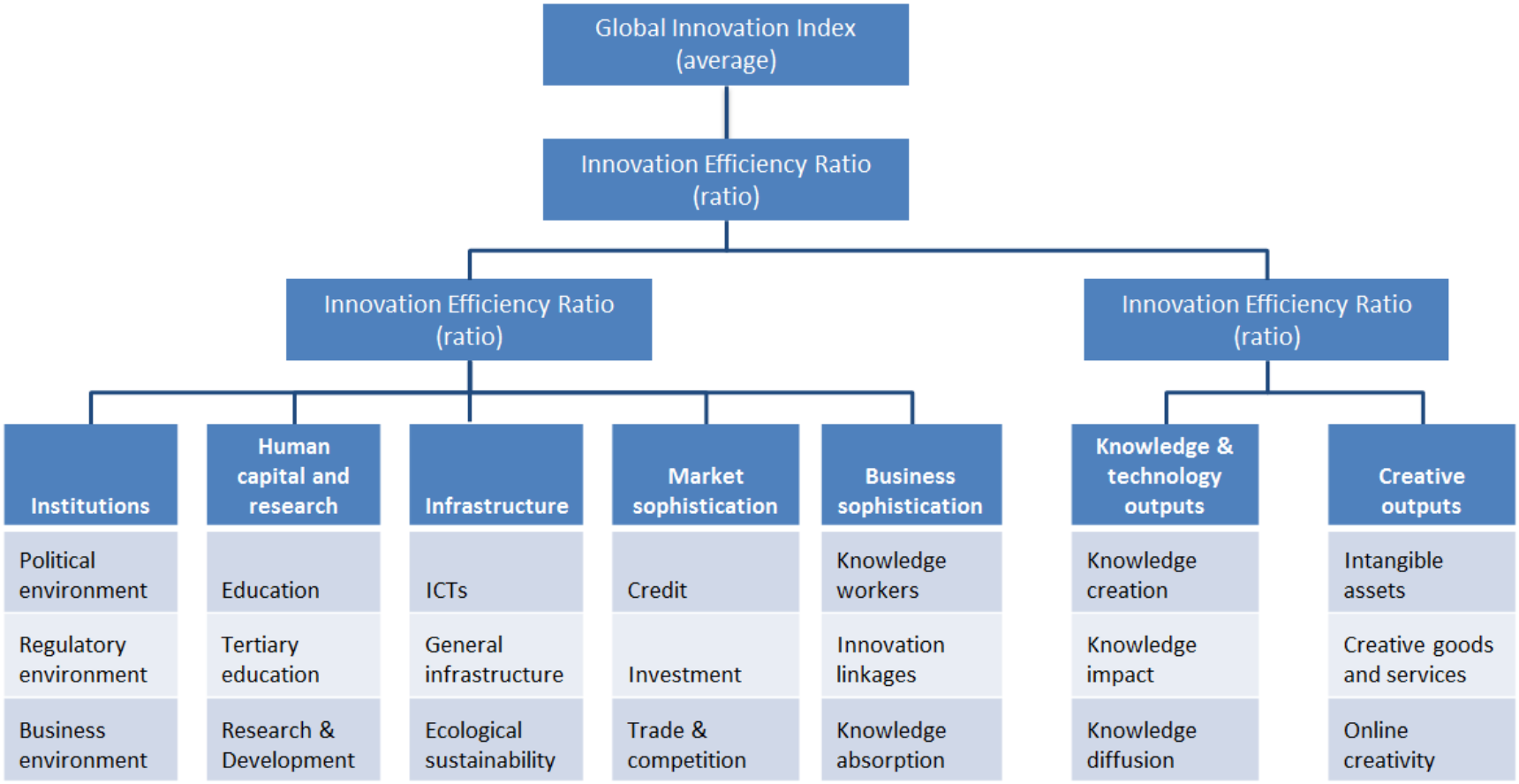
2.1.1 MEASURING INNOVATION: THE GLOBAL INNOVATION INDEX

The Global Innovation Index[7] (GII) recognizes the crucial role of innovation in driving economic growth and wellbeing. It aims at capturing the various characteristics of innovation and at being suitable to developed and emerging economies alike. In so doing, it helps policy makers and business leaders to overcome the traditional one-dimensional

[6] Carayannis and Cambell published in 2008 their work on the *Composite Innovation Index*, representing one of the first examples of composite index attempting to manage and optimize the innovation process internally. In particular, they have been acknowledged to have understood that "innovation is not a certain stage in the life time of a firm but an ongoing process should help to further identify triggers, drivers and impediments of innovation and to manage innovation in firms".
[7] The first edition of the *Global Innovation Index* was published in 2007.

innovation measures towards a more holistic analysis of innovation sources and outcomes. Over the last seven years, the GII has established itself as a leading reference on innovation.
The GII 2014, in its 7th edition, is again co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO, an agency of the United Nations).
The index is composed of two main sub-indices, Innovation input sub-index and Innovation output sub-index. The average of the two sub-indices is then used to rank all the countries under the *Global Innovation Index.* Furthermore, another index is calculated starting from the two sub-indices and by simply making the ratio between the Innovation output and input, in order to show the efficiency of a country in producing innovation given the amount of input (see paragraph 2.4.1.4). The two main sub-indices are composed of several pillars that try to cover all the aspects affecting and that are affected by innovation activity. Five pillars (Institutions, Human capital and research, Infrastructure, Market sophistication and Business sophistication) are composing the Innovation Input, while two pillars (Knowledge and Technology output and creative output) are the basis for the Innovation Output sub-index. Each pillar is divided into three sub-pillars, each one composed of individual indicators for a total of 81 within the whole system (see Fig. 2.1).

Figure 2.1: Framework of the Global Innovation Index 2014



Source: *Global Innovation Index 2014*

The table below reports the first thirty countries, among the 143 analysed, in the Global Innovation Index 2014. Even if, caution need to be exercised in comparing results over the years, because the index is always evolving in order to better represent the global situation on innovation, the top part of the ranking is showing stability. As expected, the top 10 remained almost unchanged from GII 2013, with just one change due to the entrance of Luxembourg in 9th position that pushed out Ireland to 11th position. The first impression is that all the countries present at the top have one important aspect in common, namely the fact that they are high income economies. Indeed, after a deeper analysis it appears that this hypothesis is not holding anymore, since there are a lot of other high income economies that are underperforming and struggling to make into the upper part of the ranking. The first country not labelled as High Income (HI) is China in 29th position, however, saying that those countries are innovators leaders just because of their HI economies, as suggested before, would not be wise. These innovation leaders are remarkable in consistently scoring high on most dimensions of the GII model (Global Innovation Index, 2014).

TABLE 2.1: Global Innovation Index top 30

Country/Economies	Score (0-100)	Rank	Income	Rank	Region	Rank	Eff. Ratio	Rank
Switzerland	64.78	1	HI	1	EUR	1	0.95	6
United Kingdom	62.37	2	HI	2	EUR	2	0.83	29
Sweden	62.29	3	HI	3	EUR	3	0.85	22
Finland	60.67	4	HI	4	EUR	4	0.80	41
Netherlands	60.59	5	HI	5	EUR	5	0.91	10
United States (USA)	60.09	6	HI	6	NAC	1	0.77	57
Singapore	59.24	7	HI	7	SEAO	1	0.61	110
Denmark	57.52	8	HI	8	EUR	6	0.76	61
Luxembourg	56.86	9	HI	9	EUR	7	0.93	9
Hong Kong (China)	56.82	10	HI	10	SEAO	2	0.66	99
Ireland	56.67	11	HI	11	EUR	8	0.79	47
Canada	56.13	12	HI	12	NAC	2	0.69	86
Germany	56.02	13	HI	13	EUR	9	0.86	19
Norway	55.59	14	HI	14	EUR	10	0.78	51
Israel	55.46	15	HI	15	NAWA	1	0.79	42
Korea, Republic of	55.27	16	HI	16	SEAO	3	0.78	54
Australia	55.01	17	HI	17	SEAO	4	0.70	81
New Zealand	54.52	18	HI	18	SEAO	5	0.75	66
Iceland	54.05	19	HI	19	EUR	11	0.90	13
Austria	53.41	20	HI	20	EUR	12	0.74	69
Japan	52.41	21	HI	21	SEAO	6	0.69	88
France	52.18	22	HI	22	EUR	13	0.75	64
Belgium	51.69	23	HI	23	EUR	14	0.78	55
Estonia	51.54	24	HI	24	EUR	15	0.81	34
Malta	50.44	25	HI	25	EUR	16	0.99	3
Czech Republic	50.22	26	HI	26	EUR	17	0.87	18
Spain	49.27	27	HI	27	EUR	18	0.76	60
Slovenia	47.23	28	HI	28	EUR	19	0.78	53
China	46.57	29	UM	1	SEAO	7	1.03	2
Cyprus	45.82	30	HI	29	NAWA	2	0.77	56

Source: *Global Innovation Index 2014* (See Annex 2 for full rankings).

Switzerland confirmed its leading position for the fourth consecutive year (2011-2014), while United Kingdom moved from the third to the second position, showing an outstanding growth from 10th in 2011. UK performed very well over this period, in terms of sub-indices, for infrastructure (+17), creative outputs (+12.3) and market sophistication (+7). Indeed from 2013 the biggest improvement are in Human Capital (+4.1) and knowledge & technology outputs (+5.3). The United Kingdom by consistently leveraging on its strong institutions was able, over the last 4 years, to improve its infrastructure surrounding the business environment (especially in the ICT sector) and at the same time to create better condition that leaded to high score in market sophistication. Finally, it must be underlined the really high potential that UK has in terms of human capital & research, which inevitably leads to high scores in any areas where knowledge becomes fundamental (again ICT sector first).

It must be noticed that the composition of the indices inside the GII could be different from one year to the other, so a comparison of the different scores should not be considered as empirical evidence. The same applied to a comparison of the position in the rankings, since for some of them even if the index itself decreased, the position improved in relation to the poorer performance of the other countries. However, a summary of the trends is presented below, since it could be useful anyway in order to understand roughly the performance of countries over the last four years. All the other components of the top10 exhibited up and down movements, with Finland, Singapore and Denmark gaining positions, whereas Netherlands, USA and Hong Kong dropped slightly.

TABLE 2.2: Global Innovation Index top 10 (2011-2014)

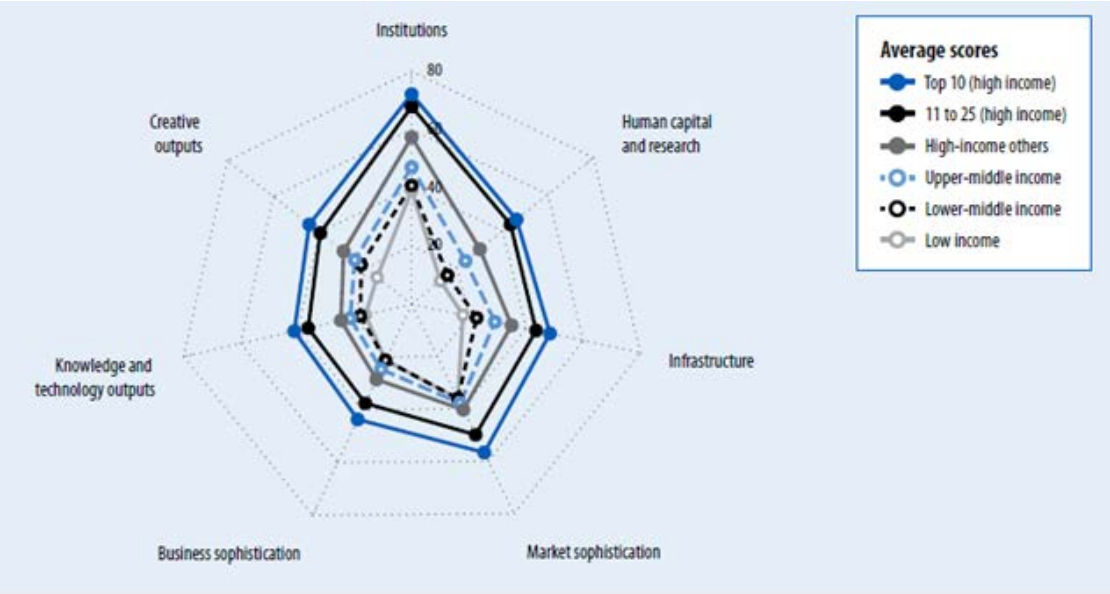
	2011	2012	2013	2014
1	Switzerland	Switzerland	Switzerland	Switzerland
2	Sweden	Sweden	Sweden	United Kingdom
3	Singapore	Singapore	United Kingdom	Sweden
4	Hong Kong (China)	Finland	Netherlands	Finland
5	Finland	United Kingdom	United States (USA)	Netherlands
6	Denmark	Netherlands	Finland	United States (USA)
7	United States (USA)	Denmark	Hong Kong (China)	Singapore
8	Canada	Hong Kong (China)	Singapore	Denmark
9	Netherlands	Ireland	Denmark	Luxembourg
10	United Kingdom	United States (USA)	Ireland	Hong Kong (China)

Source: *Global Innovation Index 2014-13-12-11.*

In the last years, innovation leaders were always high income economies, creating the perception that despite the broader holistic approach to innovation, results still highlighted the divide between income groups. For example, the average score of Northern America is 58.11 and for Europe is 47.23, already presenting more than ten points difference. However, the situation is not yet dramatic until the comparison is made with Western Asia or Latin America and Caribbean, scoring on average 35.73 and 32.85 respectively. In the following plot (fig. 2.1) it is possible to understand graphically the difference between HI countries and lower ones. The first remarkable difference is between the top 25 high income economies

and the other high income countries. Then all the pillars keep decreasing constantly while moving down in the income ranking, showing a high marginal decrease rate in human capital and research. In fact, average scores at pillar level present the largest difference in that category, with a span of 41.04 points between Northern America and Sub-Saharan Africa. This evidence is strictly linked to the main topic of GII 2014, which is the development of the human factor in order to achieve a sustainable growth in an innovative perspective (see dedicated paragraph).

Figure 2.2: The persistent innovation divide: Stability among the top 10 and the top 25



Source: *Global Innovation Index 2014*

Main findings: Top innovators by input

The Innovation Input Sub-Index considers the economic elements that enable innovative activity through five pillars, which result to be conductive to innovation within an economic environment. The top 10 economies in the Innovation Input Sub-Index are Singapore, Hong Kong (China), the UK, the USA, Finland, Sweden, Switzerland, Canada, Demark, and Australia. **Singapore** is leading this ranking mainly due to its performance in Business Sophistication, Human Capital and Research, and Infrastructure, where it is first and two times second respectively. However it is ranked only 25th in the output sub-index, explaining the reason why it presents the lowest efficiency ratio of the top 10. The second position is occupied by **Hong Kong** (China), which this year has given the leadership of Asian economies to Singapore. Its economy can count on the highest level of Infrastructure (1st) 3rd level on market sophistication and top positions in Credit, Knowledge absorption and Ecological Sustainability. To conclude the podium is placed at third position, the **United Kingdom**, a confirmation of its very good overall improvement in GII scores over the last three years.

Canada and Australia are the only two economies in this group that are not included in the GII top 10. **Canada** is ranked 12th in the overall GII, but it presents top 10 rankings on the Institutions pillar (7th) due to its strong performance (2nd) in the Business environment sub-pillar, on the Market sophistication pillar (5th), with a robust performance in the Investment

(4th) and Trade and competition (5th) sub-pillars. **Australia** instead is ranked 17th, up two positions from 19th in 2013. It ranks 10th overall in the Input Sub-Index, with top 10 rankings on three pillars: Human capital and research (7th), Infrastructure (7th), and Market sophistication (10th). Its strengths are in Trade and competition (1st), Tertiary education (7th), Research and Development (8th), ICTs (9th) and General infrastructure (9th) sub-pillars. The new governmental policy about venture capital grants has been fundamental in order to increase the number of *venture capital deals* entered into, an indicator exhibiting an improvement of three places (23rd place). The Creative goods and services sub-pillar are presenting diverging results, with strengths and weaknesses. Australia's weaknesses include cultural and creative services exports (52nd) and national feature films produced (49th); the country's strengths include global entertainment and media output where it is 3rd and holds 5th position in printing and publishing output (see annex 2).

Main findings: Top innovators by output

The Innovation Output Sub-Index variables provide information on the resulting features of innovation. Despite different scores on the Input and Output sub-indices leading to significant variations in rankings from one sub-index to the other, the data claims that efforts aimed at improving enabling environments entail increased innovation outputs. The top 10 countries in the Innovation Output Sub-Index are Switzerland, the Netherlands, Sweden, the UK, Luxembourg, Finland, the USA, Germany, Iceland, and Malta. The USA entered the group just this year (12th in 2013) replacing Israel, which fell to 13th place (within top 10 in 2013). Seven of these countries are in the GII top 10.

Switzerland presents the best Knowledge and Technology output in the World and it is consistent in scoring among the top 25 in all pillars, with just four exceptions. Leveraging on its Knowledge-based economy, it is able to transform its solid innovation capabilities into top level of innovation output (6th in efficiency ratio, 1st among GII top 10). **The Netherlands** is ranked second translating this performance into a growth of 14 positions in the innovation efficiency ranking. It is presenting an outstanding good overall performance, by scoring within the top 25 in all pillars, in 16 of the 21 sub-pillars and in 55 out of 78 indicators. Apparently, the only weakness is related to the tertiary education, even if a process of catch up has begun, confirmed by progress this year. The leader among Nordic countries is **Sweden**, which lost one position in the GII index, but still is performing very well globally. On the Output sub-index it is ranked 3rd, mainly due to its performance in the Research & Development sub-pillar. Sweden is ranked among the top 3 in Knowledge and Technology outputs, due to its high number of patent applications and licensee fee receipt. Furthermore, together with Switzerland, Sweden is one of the five economies at the efficient frontier.

Findings by countries:
Australia

As written above Australia is ranked 17th in the overall GII 2014, while it is 10th in the Input Sub-Index, with top10 rankings on three pillars: Human capital and research, Infrastructure and Market sophistication. Its major strengths could be identified in those three areas plus institutions and creative outputs, where it is ranked 11th and 12th respectively. The

performance decreases when moving to the remaining two classes, namely business sophistication (26th) and knowledge & technology outputs (31st). The main points where an improvement is necessary appear to be related to knowledge diffusion and absorption, high-tech & medium-tech manufactures and to the GERD[8] financed by abroad. These points of weakness seem to be the consequence of the lack of graduates in science & engineering when comparing it to other countries (73th). The high performance in fundamental area such as: institution, infrastructure and human capital makes Australia a country with high potential for innovation. However, in order to turn it into a knowledge economy/country it could leverage more on those strengths in order to address quickly and efficiently the weaknesses highlighted before (see Annex 3 for complete Australia profile).

BRICs

In the paragraphs above, by reporting the main findings by input and output, some results were already described by country. Here, the analysis is moved towards BRICs and the USA as the two main regions of interest. Among the **BRICs**, three improved their positions (Brazil, the Russian Federation and China. India, on the other hand, has continued to fall by further 10 positions, to 76th position this year.

The progress of China and Russian Federation in the rankings is the most relevant in all countries. China's ranking is now comparable to that of many high-income economies (first one non HI at 29th position), while Russia showed the highest marginal improvement with 13 places gained reaching 49th. Most of the BRIC economies are also giving other signs of progress, with all of them been qualified as "efficient innovators" this year, meaning that they have innovation efficiency scores greater than or equal to the average of 0.74. Looking at the subset of GII indicators related to the quality of innovation, three BRIC economies (China, Brazil, and India) lead the group of middle-income countries. Alone, among the BRICs, **China** looks to be close to entering the top 25 in the GII. China ranks 2nd in innovation efficiency in 2014 on a global basis and is growing steadily along many dimensions of the GII. The country is characterized by an impressive 2nd position in the Knowledge and Technology outputs pillar and shows discrete improvements in the Creative outputs pillar, ranking 1st in Creative goods exports. However, there is potential for significant improvements in the Institutions pillar.

On the other hand, all the other BRICs economies have their own strengths and weaknesses, and they are not yet able to show the kind of growing and complete improvements that are needed to bring them to the top ranks of the GII. **India**, in particular, faces various challenges, mostly related to the problem of the quality of its higher education, which has grown very fast in India over the last 3 decades. Such rapid growth, concentrated in private rather than public institutions and focused on only a few professional fields, has given the rise to a severe faculty shortage affecting almost every Indian institute. The second main issue for India is the creation of an Education and Research University; especially due to the investment in public research (right now this addresses mainly private institutions). The allocation of public funds to research has grown over the last years from barely 1% to 4%,

[8] Government Expenditure on R&D

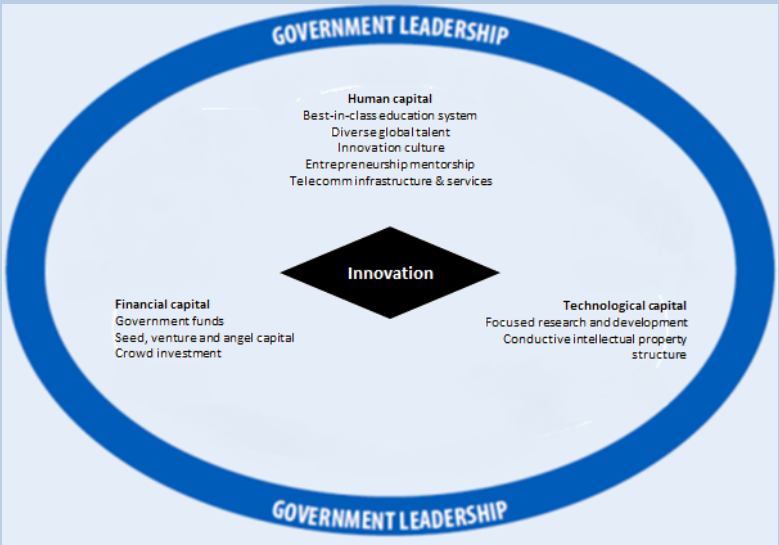
however it is still not comparable to the international norm ranging from 15% to 25% of national R&D. The other two aspects are the provision of equity of access, and the creation of world-class, full-service research universities. The problem with equity of access is that the overall Indian education is becoming increasingly private and expensive (GII 2014), while the second issue relates to the lack of world-class institutes able to give prestige to the nation and to form new leading generations. Addressing these aspects may allow India to realign its path with the rest of the BRICs. If India does not start to focus on these issues and on improving its innovation output, the country is likely to keep dropping in the rankings and become less innovation efficient.

BOX 1: the United Arab Emirates Innovation Ecosystem for Knowledge-Based Economy

One good example of a country that is transforming itself into an innovative knowledge-based economy and improving its performance in the GII is United Arab Emirates (UAE). The country's vision established by its leadership is to make UAE become the economic, touristic and commercial capital for more than two billion people by transitioning to a knowledge-based economy, promoting innovation and Research and Development, strengthening the regulatory framework for key sectors, and encouraging high value-adding sectors. These will improve the country's business environment and increase its attractiveness to foreign investment (*UAE's Vision 2021*).

The UAE is working on three layers simultaneously in order to create the best environment for innovation to flourish. While developing the most important one, namely Human Capital (1), they are addressing (2) Financial and (3) Technological capital as key enablers for the development of the whole system, especially the first aspect. Nowadays UAE is becoming a key player in real estate, aviation and renewable energy, while at the same time it is a hub for trade and logistics, financial services and tourism.

The three layers of Innovation in the UAE



In order to develop Human Capital, the first step is the investment in the education sector. The UAE budget allocation represents more than 20% of its total budget, higher than an international average of 13%. Together with an internal policy of investment, the UAE is engaging constantly with international partners in order to ensure higher and higher education quality.

The main examples are the Khalifa University of Science, Technology, and Research as a result of the governmental investment and the Emirate of Dubai, which alone has attracted 26 international universities from over 10 countries as a result of its international engagement. Furthermore, the composition of Human Capital is much diversified, with Immigrants constituting 96% of the total UAE workforce, but still efforts are displayed by the government to foster internal development of human capital.

On the financial side, several sources of funding are available, including a big part provided by the state programmes to support start-ups and local enterprises especially in the ICT sector. Then, due to Dubai's commitment to EXPO 2020 *"Connecting Minds, Creating the Future",* there is also a fund devoted to support innovation and entrepreneurship ideas within the three main themes of the expo: mobility, sustainability, and the creation of opportunities.

When not provided by the government, funds are provided by a wide range of other actors, which include seed, business angel, venture capital and, last but not least, the bank sector. According to data, the number of VC deals in UAE has grown by 50% in the years between 2010 and 2012, with 47% of it devoted to technology business. However, VCs are still risk-adverse and tend to invest more in already developed start-ups, but a growing trend concerning Crowd Investment is emerging. Crowd funding is globally becoming a known phenomenon and even if in UAE it is being accepted slowly, some good examples of crowd-investment organizations are starting to appear (i.e. Zoomal).

In line with UAE's vision of a knowledge-based economy, the government's R&D efforts are targeted at specific sectors to solve its market needs and key socioeconomic challenges (GII 2014). However, the R&D expenditure as a percentage of its GDP was 0.47% in 2011, seriously below the OECD average of 2.32%. Evolving together with the investment in R&D, there is the necessity of an enforceable IPR system, which was addressed recently with the standardization of the system in order to comply with international standards.

The example of UAE could be a suitable best practice for those countries looking for a path to follow in order to start their transition to a knowledge-based economy. That pattern of transition could be simplified thanks to the following points:

- Institutionalize top-down aspirations
- Attract and promote talent through education system
- Provide and promote access to capital at all funding levels
- Strong engagement in local and international partnership
- Unlock telecommunications operators' potential role in the innovation ecosystem

Nevertheless, it must be underlined that the development path of the UAE, especially of Dubai and Abu Dhabi, seems difficult to replicate entirely due to its particular circumstances. The fast capacity of taking decisions in the past, the availability of resources due to its oil deposits and the presence of low cost labour have played together in the past to set the nowadays fertile conditions. In short, the development path followed by UAE does not easily present itself as a model that can be generalized to other economies, but still it could represent a useful guide tool.

The Innovation Efficiency Ratio

The Innovation Efficiency Ratio, as already briefly introduced, is the ratio of the Output over the Input Sub-Index. The relationship between the GII rankings and the efficiency ratios is marginally positive, as expected, implying that more efficient countries obtain on average, higher GII scores. The efficiency ratio is designed in order to be independent from countries' stages of development as it is reflected by the data. Efficiency ratios must be evaluated taking into accounts simultaneously GII, Input, and Output scores (and stage of development of the economies); since economies might reach a relatively high efficiency ratio as a result of particularly low input scores instead of efficiency itself. Thus the analysis by income group for efficiency ratios is pivotal.

The 10 countries with the highest Innovation Efficiency ratios are countries that are particularly good at overcoming relative weaknesses on their Input Sub-Indices with relatively significant output results, with GII rankings ranging from 1st to 122nd. The Republic of Moldova (43rd) is leading the efficiency ranking; China (29th) is second, while Malta (25th) ranked as third. Then the ranking continues as follow: Indonesia (87th), Viet Nam (71st), Switzerland (1st), Bolivarian Republic of Venezuela (122nd), Nigeria (110th), Luxembourg (9th), and Côte d'Ivoire (116th).

As already mentioned, caution needs to be exercised in interpreting this ranking, because it appears clearly that most of the countries in the top10 are actually underperforming in the GII. In the following table the best five countries in terms of efficiency and divided by income group are reported.

TABLE 2.3: Most efficient countries divided by income group

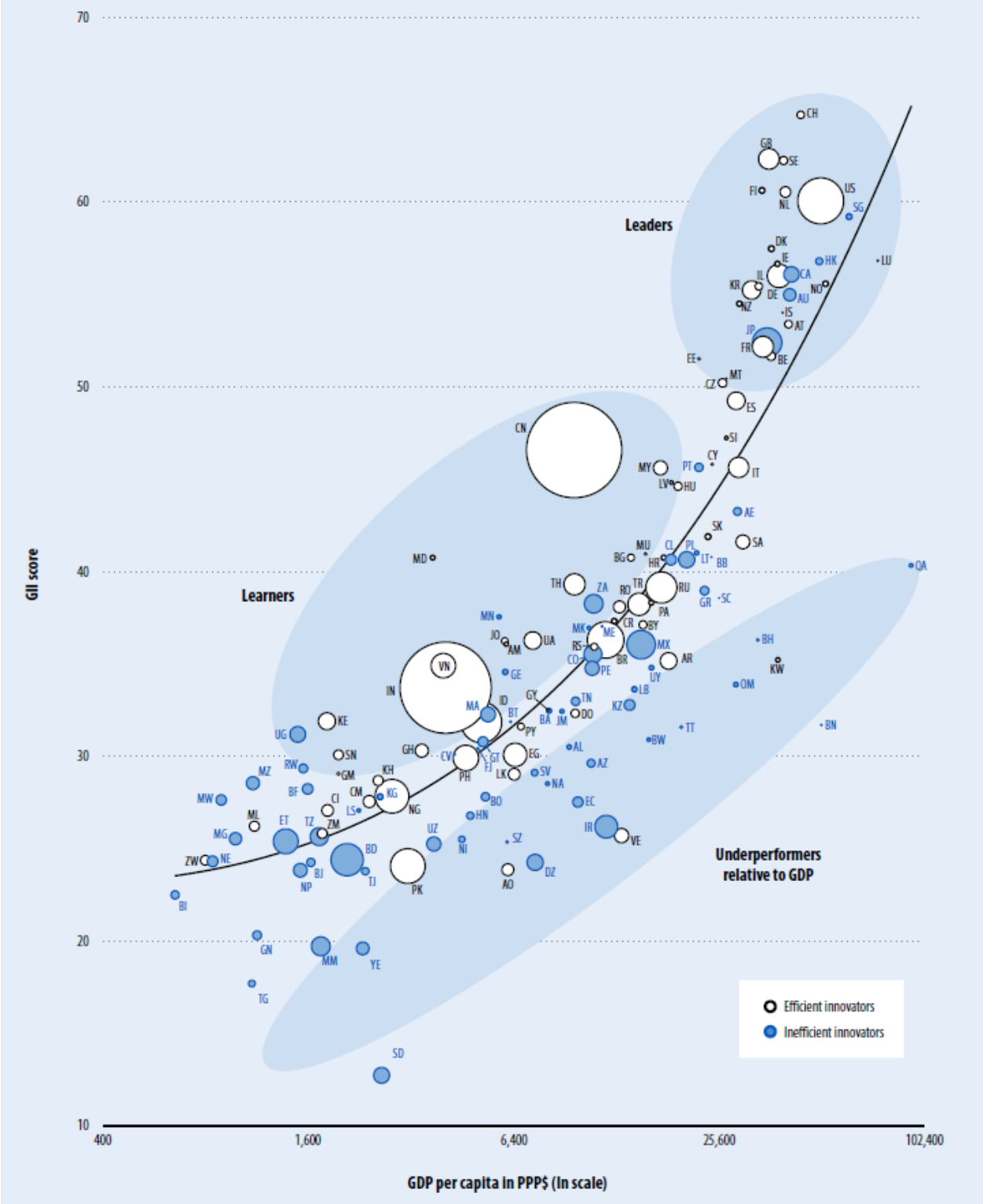
High-Income	Upper-middle-income	Lower-middle-income	Low-Income
1. Malta	1. China	1. Moldova, Rep. of	1. Kenya
2. Switzerland	2. Bol. Rep. of Venezuela	2. Indonesia	2. Mali
3. Luxembourg	3. Turkey	3. Viet Nam	3. Zimbabwe
4. Netherlands	4. Hungary	4. Nigeria	4. Gambia
5. Iceland	5. Panama	5. Côte d'Ivoire	5. Cambodia

Source: *Global Innovation Index 2014*

Strictly connected to the concept of efficiency, there is the concept of innovation leaders and learners. Countries, generally speaking, should leverage on their strengths and at the same time address weakness in order to transform them into opportunities. The group of the so called innovation leaders remain unchanged from 2013, with all economies scoring more than 50 points in the GII. They have already created a successful environment for innovation in terms of human capital investment, infrastructure and market structure. Among innovation learners, the main objective is to increase their efficiency through improvements in institutional framework, creation of skilled labour force (investment in human capital) and a deeper integration with global credit investment and trade markets.

In the following graph (fig. 2.3) the GII score against the GDP per capita are plotted, and this gives the possibility to visualize three main groups in the dynamics of global innovation. All the economies that appear close to the trend line are in accordance with was expected. Positioning themselves below the trend line means underperforming, even if like every model there are some limitations. Since the graph is plotted with GDP per capita as one variable, this may result in some countries underperforming due to their exceptional high level of GDP together with low level of population. This is the case for example of most of the Middle-East economies (with the exception of UAE), where given their abundance of resources, especially Oil, they result to have remarkable GDP per capita. Then, when this variable is plotted against their level of innovativeness (GII scores), the ratio tends to push them into the underperforming group.
The efficiency ratio should be interpreted by governments as a warning signal. If an economy is presenting high level of input and low efficiency ratio, probably the concerns are about the process of transformation of those inputs into valuable outputs. Indeed, if a country is presenting a high ratio of efficiency accompanied by low level of inputs, it means that what is needed is a more powerful infrastructure and targeted investment in order to leverage more on that efficiency.

Figure 2.3: GII Score vs GDP per capita



Source: *Global Innovation Index 2014*

In the Global Innovation Index 2014 are also presented a perfect match, where based on the rankings of every selected indicators, the top performing country in that area are assigned to that task. This is really useful in order to understand which is the best country under a specific perspective and also could be really interesting for policy maker in order to realize which are their points of strength (if they have any) or where to look for best practices. In the following table is reported a summary of what a '*Perfect World for Innovation*' could look like.

TABLE 2.4: THE PERFECT WORLD FOR INNOVATION	**COUNTRY**
Institutions:	
– *Government effectiveness*	**Finland**
– *Regulatory Quality*	**Singapore**
– *Ease of Doing Business*	**New Zealand**
Human Capital & Research:	
– *Expenditure on education per pupil as share of GDP*	**Mozambique**
– *Graduation in science & engineering as of tertiary graduates*	**Thailand**
– *R&D expenditure as share of GDP*	**Rep. of Korea**
– *Performance of pupils in reading, mathematics, & science*	**China**
– *Enrolment in universities*	**Qatar**
– *Quality of Universities*	**United Kingdom**
Infrastructure:	
– *Use of information technology*	**Sweden**
– *Online e-participation*	**Kazakhstan**
– *Environmental performance*	**Switzerland**
– *New infrastructure investment & capital formation as share of GDP*	**Mongolia**
Market Sophistication:	
– *Importance of micro-financing*	**State of Bolivia**
– *Venture capital deals*	**Israel**
Business Sophistication:	
– *Employment of knowledge workers*	**Luxembourg**
– *University/industry research collaboration*	**Switzerland**
– *Joint venture deals*	**United Arab Emirates**
– *Patents protected internationally*	**Japan**
Knowledge & Technology outputs:	
– *Number of scientific & technical articles*	**Iceland**
– *Quality of scientific publications*	**Germany**
– *Rate if new business creation*	**Hong Kong, China**
– *Royalty & license fee receipts*	**USA**
– *Communication, computer & information services exports*	**India**
– *High-tech & medium-tech manufactures*	**Ireland**
Creative Outputs:	
– *Resident trademark applications*	**Paraguay**
– *Information technologies & organizational innovation*	**Estonia**
– *Export of creative services*	**United Kingdom**
– *Global entertainment & media output*	**Australia**

Source: *Global Innovation Index 2014*

Developing the Human Factor in Innovation

Innovation is already acknowledged to be pivotal to increase human wellbeing since it can make a difference of growth, development and success of companies, and countries in every development stage (different role). The technological progress represents the innovation key factor by raising productivity and contributing to economic growth. This "catching up" comes out from imitation, technology acquisition and research (R&D). However, in order to take advantage of innovative activities and entail a successful transfer of knowledge requires high skills, knowledge, and appropriate organizational structures as innovation depends on people who are able to create and apply knowledge and ideas. Improving human capital is resulting increasingly important in order to facilitate technology adoption and increase absorptive capacity of firms. In particular, a high-skilled workforce is achieved mainly by education both basic and advanced.

It is equally important for industries and businesses to get involved in enhancing education systems. Advances in information and communication technologies (ICT) in recent years played a crucial role in transforming traditional education and making it more accessible, affordable, and effective globally (Ken Hu. Deputy Chairman, Huawei). Now in turn, private companies in the industries can play a crucial role in improving the human factor leading the whole system to a better level of innovation.

UIS[9] data reports a correlation between educational attainment and the development level of countries, but on the other hand, correlation does not imply causation. Does a lack of skills lead to poor development, or does poor development lead to a less-skilled population? A more detailed analysis on regional basis would be needed, where the demand for skills of employers are matched with the supply of these skills by highly-educated people (GII 2014). Thus more information is needed, even at micro level, and then further analysis is needed using econometric methods.

2.1.2 INNOVATION THEORETICAL MODELS (HELICES – FRACTAL)

As we can read in the work of Serrao and Tortorici (*Regional Innovation Policy*, 2013), innovation is increasingly becoming a local phenomenon because of the decentralisation of powers and resources from central governments to regional and local administrations. However, not all the local governments have to embrace the same policy. There are no "one size fits all" strategies. OECD identifies three different types of regions, each one with a different priority and a specific strategy. The first one is known as Knowledge hubs, the second are called industrial production zone and the last one are non-Science & technology driven regions. This approach provides a useful framework to understand the differences between regions which are more dependent on innovative knowledge and can continue to build on current advantages, and more traditional ones where a socio-economic support or a catch up strategies are needed. In this section, the attention is focused on the description and analysis of two main models of innovation ecosystem. The first part will be dedicated to

[9] UNESCO Institute for Statistics. UIS Data Centre. Available at: http://www.uis.unesco.org/datacentre/pages/default.aspx

the discipline related to helix models (especially triple helix model), while the second one will deal with a newer concept called fractal innovation ecosystem.

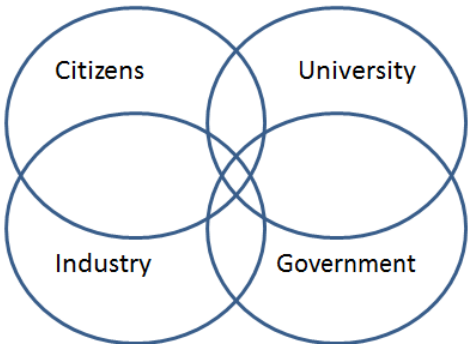
Helix Models

The "Triple Helix" (*TH*) model is considered one of the most interesting approaches to innovation policy at a local level. A conceptual and analytical framework is provided, focusing especially on successful policies taken from past experiences. The study points out all the functions and interactions of the three main stakeholders: universities, firms and governments. Following the theory of Etzkowitz, three main interaction areas of the innovation stakeholders can be identified: the *Knowledge space* represented by a critical mass in knowledge at local level (i.e. research centres and universities); the *Innovation space* constituted by the way innovation is carried out at local level and the *Consensus space* where the three stakeholders can brainstorm and realize new ideas. According to our purposes, afterward a deeper explanation of the Innovation space will be provided. Innovation policies designs, taking into account the regional characteristics, result key feature in order to avoid the negative consequences of a dogmatic approach. Moreover, it is essential to identify who is the stakeholder which, according to the local characteristics, takes the leading role in developing and implementing regional innovation policies.

Thus this model encourages reflecting on more than two possible dynamics (markets and governance). Nevertheless, in a research project, one may wish to consider one of these contexts as given, but the reasons for this reduction should be well deliberate and explained. Such an explanation can be expected to enrich the semantics because at least the three selection mechanisms are relevant in knowledge-based economy developments.

The Triple Helix indicator can be extended algorithmically, for example, with local-global as a fourth dimension or, more generally, to an *N*-tuple of helices. After the Triple Helix, focused on the relations between university, industry and government, it followed the "Quadruple Helix" innovation model adding as fourth feature the **"media-based and culture-based public" and "civil society"** (Fig. 2.4). Then, the "Quintuple Helix" is even broader and more comprehensive by contextualizing the Quadruple Helix and by further adding the helix of the "**natural environments of society**". The original model (Triple Helix) acknowledges explicitly the importance of higher education for innovation. However, it could be argued that the Triple Helix places the emphasis on knowledge production and innovation in the economy in order to be compatible with the knowledge economy. The Quadruple Helix already encourages the perspective of the knowledge society, and of knowledge democracy for knowledge production and innovation asserting that the sustainable development of a knowledge economy requires a coevolution with the knowledge society. The latter one stresses the importance of the socioecological transition of society and economy in the 21st century, being ecologically sensitive. Within its

Figure 2.4: Quadruple Helix Model



framework, the natural environments of society and the economy also should be seen as drivers for knowledge production and innovation, therefore defining opportunities for the knowledge economy. The Quintuple Helix thus supports the formation of a win-win situation between ecology, knowledge and innovation, creating synergies between economy, society, and democracy. For instance, global warming represents an area of ecological concern, to which the Quintuple Helix innovation model can be applied with great potential.

However, these models require substantive specification, operationalization in terms of potentially relevant data, and sometimes further relevant indicators. Without such a perspective, **parsimony** itself may be a methodologically well-advised strategy: so long as one is not able to operationalize and show development in the relatively simple case of three dimensions, one should be cautious in generalizing beyond the Triple Helix model to an *N*-tuple of helices.

Triple Helix Innovation Model

The triple helix innovation model was introduced for the first time in 1995 by Henry Etzkowitz and Loet Leydesdorff and aim to describe the pattern of interaction between the three main actors within a country (economy): University, Industry and Government. According to their theory there are three kinds of configurations of the interaction among those actors.

The first mode is the configuration in which the national government encompasses academia and industry sphere and directs the relationship between them (Fig. 2.4). Moving from the first one, called also Static model, to the second named "*laissez faire*" where the three institutional spheres resulted separated with strong borders and the relations among them are highly circumscribed (Fig. 2.5). Finally, the idea proposed by the model itself as the real triple helix innovation model, where the three spheres are overlapping each other, with everyone taking the role of another one and hybrid organizations been created at the interfaces (Fig. 2.6).

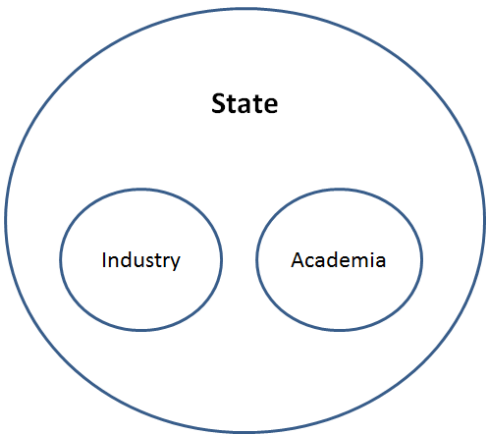


Fig. 2.5: a static model of university-industry-government relations

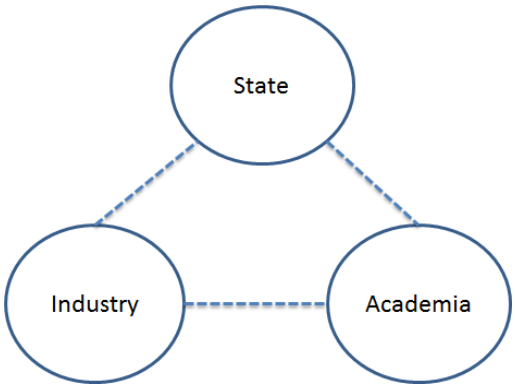


Fig. 2.6: a *laissez faire* model of university-industry-government relations

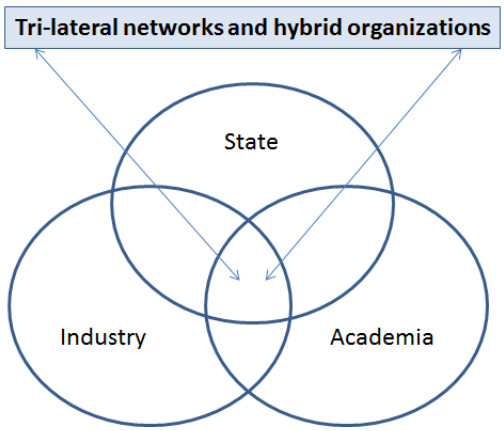


Fig. 2.7: the triple helix model of university-industry-government relations

The triple helix innovation model aims to the creation of an innovative environment composed by many different hybrid organization and relationship, such as spin-off firms from University or collaborations and initiatives between different companies, in terms of size and technology level, and government laboratories or research centres. In this context, the definition of a research program on innovation is becoming matter of how much the policy maker is in control or non-control of those dynamics since the underlying hypothesis of the Triple Helix is that the system can be expected to remain in transition. The dynamics of interaction between the spheres, and of technology and economic development are nonlinear and this model of innovation is supposed to be an extension upon linear model, taking into account interactive and recursive terms. Neoclassical economists were focused on markets as networks in terms of input-output model where rational individuals operate, indeed evolutionary economists see firms as carriers of a continuous innovation process. Thus, the unit of analysis and the unit of operation in this new model are changing together. *"Nowadays, the development of a new technological trajectory invokes the support of national governments at even international levels like the EU, using increasingly a Triple Helix regime (Frenken and Leydesdorff)".*

The innovation system, according to Etzkowitz & Leydesdorff, should be considered as the dynamics of change for both production and distribution models. The uneven technological developments across sectors require new allocation/distribution of competencies, and the solution to this "production puzzle" brings into the scene the policy maker (government) moving from a double to a triple helix model.

Another interesting point is the evolution of the purpose of the development of science, which in the past was considered as separated from market and economic dynamics. Nowadays, it seems clear that the development of science provides the basis for future industrial and economic development, which in turn is the basis for region/country prosperity. Seeking this regional prosperity changed the importance of the location of that research, which in the past was seen to be weakly linked to its eventual utilization. Recently, this idea has changed dramatically and regions which present less research-intensive behaviour, know that science applied to local resources and is the basis for much of their potential economic and social development. This new concept gives space to all the theories and studies about clustering and the advantages that can derive from clusters. However,

science will still present its fundamental connotation and the university sphere will remain the core institution for what concerns knowledge as long as it retains its original educational mission (Etzkowitz and Leydesdorff, 2000).

The Triple Helix model explain not only a new way of creating relationship among the three spheres, but also internal transformation that takes place within university, industry and government. The first one, for example, has been transformed from just a teaching institution to one that combines teaching and research (i.e. Bay-Doyle act). The force driving this new way of interaction among spheres could be described as "profit", where profit means completely different things to the different actors involved. Once again there is a need for changing the perspective, knowledge intensive economies can no longer be based on simple measures of classical profit maximization and they should start taking into account opportunity structures. Now utility functions have to be matched with opportunity structures. The model is presenting a system that is neither not fully integrated nor differentiated; instead it is taking advantages from the edges by performing on fractional differentiations or local integrations. Initially, the frequency of external interactions is lower than the frequency internally generated within each helix. Then, thanks to the availability of ICT and technological culture, options for recombination of the boundaries between spheres are provided. The price may be felt as a loss of traditional identities or alienation or as a concern with the sustainability of the reconstruction, but this is the new mode of knowledge production, which generates an endless transition that continuously redefines the borders of the endless frontier (Etzkowitz and Leydesdorff, 2000).

BOX 2: Bayh-Doyle act and its effects

As an example of internal transformation within the TH model, in the previous paragraph is reported the shift of the universities from mere teaching institution to one that combines teaching and research. One important moment in the history about universities and their research activities is the introduction of the Bayh-Dole Act or Patent and Trademark Law Amendments Act (December, 1980) in the United States of America. Briefly, that act allowed for the first time Universities to have the right to patent their results coming from publicly (federally) funded research. This does not mean that before the introduction of the act there were no university engaged in patenting practices; but simply that before universities willing to do so have to negotiate an Institutional Patent Arrangements (IPA) with the individual funding agency or use the Research Corporation.

The logic behind the introduction of Bayh-Dole act is that there was raising concern about the capability of the whole US system to transfer technology from university sphere or the ability to commercialize research results and in that way weakening the overall competitiveness of the country. Furthermore, "Bayh-Dole idea" argued that there was a lack of incentive for industry to develop university inventions, since there were no exclusive licenses granted to them. Even if, it must be reported that recent survey to firms have pointed out the fact that they benefit most from university research when it is public available via publications, conferences, informal information channels and consulting (Cohen et al. 1998). And the fact that scientific knowledge is "not rival in consumption", thus deny the access to it could simply charge more costs on the whole society.

The act affected university capability and easiness to patent in three main ways. First by replacing the complicated issue of IPAs, second by representing a congressional expression to support exclusive licensing between universities and firms and third it represented a commitment of the congress to the argument that patent protection is needed in order to exploit federal funded research.

The resulting effect of the introduction must be analysed in the context of a more general shift of the US government towards intellectual property right protection, explaining why the effect of Bayh-Dole act per se tend be confused with the one of other policies or with the overall changing in the US socio-economic environment in the beginning of the 80s.

However some numbers resulted pretty clear, like patents issued to US universities that doubled between 1979-1984, again in 1984-1989 and again from 1989 to 1997. The number of technology transfer offices[2] increased from 25, when the act was introduced, to 200 in ten years. These represent clear signals of a changing environment, but to which extent this change is attributable to Bayh-Dole act is hard to say. In facts, some evidences suggest that many US universities were already expand their activities in patenting or licensing before the effective introduction in 1980.

The increasing number of patents application by universities, combined with the increase of patenting per R&D (in a historical period showing opposite tendency) raised the issue about the quality and usefulness of all these new inventions. By the end of the first decade after the introduction of Bayh-Dole act, was easy to observe in many universities very small share of all patented inventions accounts for the majority of gross licensing revenues. Some first studies conducted after, seemed to show a tendency of a decreasing quality in patented inventions (estimated through patent citations). However a further analysis have highlighted several problems connected to truncation bias and concluded that has been no decline in the quality of university patents after Bayh-Dole act.

Interaction between components of Triple Helix Model

The interaction and relationship between the different components of the model vary from case to case according to the specific economic, social and institutional conditions. In the work of Ranga and Etzkowitz (2013) are identified four different patterns of interaction, which could work separately or in conjunction:

1) **Collaboration and conflict moderation** relates to the interaction among the three spheres and among entities inside and outside one sphere, with the potential to turn tension and conflict into convergence of interest. In order to create win-win situations, the different stakeholders have to be able to leverage on their knowledge accumulated over a life-long process of education rather than a single company career (Spittle, 2010).

2) **Collaborative leadership,** take place when all the three actors of the model collaborate in order to reach a common and shared result. It could be also considered as part of collaboration and conflict moderation, thus it has not to be seen as alternative to the first one, but indeed complementary.

3) **Substitution** is one of the most important types of relationship and is a corner stone of the whole TH model. There are two kinds of substitution: between spheres and within spheres. The first one can be exemplified when the government sphere takes actions beyond its normal competences (which are regulation and control or investment and provision of capital) and substitutes the sphere that results to be weaker. The same reasoning applies when universities engage in different activities that are not the normal “knowledge production”, like technology transfer or firm formation through spin-off from R&D University lab. Substitution within spheres appears to be less important in terms of impact, but still can play a role. This situation happens when one entity coming from the same sphere substitutes another one, like vocational training institutions that replace university in providing short-term practical oriented knowledge.

4) **Networking** is not a specific pattern of interaction among components of the model, but instead it can be easily found inside each of the other relationships described in

this paragraph. Networks can be formal or informal and also can be at different levels, starting from national to regional or even international. The magnitude of such networking activity could result difficult to identify especially if the visibility or the age are both not high. In the fast changing environment of today, networks have started to be seen as the right way to keep flexibility and simultaneously generate cooperation benefits. For example research networks in the academia sphere, nowadays, are seen almost as joint venture, whose stability appears to be critical in order to generate a sort of division of labour (i.e. avoiding patent race).

The description of the different interactions and relationships among the components of the three spheres of the model (especially the third one), have pointed out the importance of the expected actions which theory expects from every sphere. A brief summary of those actions is presented in the table below.

TABLE 2.5: Triple Helix Framework and Expected Activities

Spheres	Stakeholders	Expected Activities
Public/Government Sphere	• Federal Government • State Government • Local Authorities	• Infrastructure investments • International promotion • Provision of funding • Development of Hybrid organization for technology transfer
Academia Sphere	• Universities • Research Centres	• Provision of high technical and scientific skills • Engagement in research activities • Firm creation through spin-off
	• Talents	• Development of new inventions • Commercialization of new ideas
Industry/Firms/Private Sphere	• Venture Capitalist • Business Angels • Banks	• Financing new business creation • Provision of managerial and networking skills to new business
	• Large MNCs	• Large investments in R&D • Collaboration with universities and research centres
	• SMEs and Start-ups	• Provision of entrepreneurial capabilities • High rate of Innovation

Source: "Regional Innovation Policy", Greater Europe Desk, DPC, Government of South Australia, Serrao and Tortorici (October 2013).

Creation of Innovation Space

The so called Innovation Space are all the activities undertaken, especially by hybrid organizations of the three helices, which aim to create, develop and unlock the entrepreneurial potential, attract talents and innovative firms from abroad (through FDI) and building a competitive advantage for the region and the country. The innovative potential of hybrid organizations themselves can be improved as well, thanks to entrepreneurial training programmes or business plan competitions. In order to create an Innovation Space there are several ways proposed by Ranga and Etzkowitz (2013), but here are presented just two among the most important ones:

- ***Creation of a university in a region without higher education capacity.*** This practice have the final aim of increasing the technological level of existing clusters and at the same time be the source for new ones. The main example in this field is MIT (Massachusetts Institute of Technology) established in 1862 as a support to the Boston textile cluster and became in the early 20th century crucial for the creation of new industries. Thanks to its research programmes and its collaborative networks with business and Government it was able to set the basis for the creation of new firms and industries, thus enforcing the strength and enlarging the cluster, and creating new ones as well.

- ***Building an integrated environment for university technology transfer and entrepreneurship activities*** is fundamental in order to be able to transfer the scientific and technological benefits of research activities to the region and the country. Even when a University establishes a technology transfer office (TTO), it appears clear that is not enough in order to go to the market of intellectual property or create spin-off. A possible solution could be to enter in a broader mechanism of networking, like the national or regional network of TTOs. Or in other case could be advisable to create alliances with local or regional governments, in order for example to create an incubator or support the creation of a spinning-off firm. One good example for this set of activities could be the one of Flemish Catholic University of Leuven (KUL) that was able to create an innovation space by making itself the core of a thriving regional innovation network.

Other innovation system approaches

Innovation theory has often recognized the Triple Helix model as an alternative approach to the "innovation systems" concept. Introduced in 1985 basically by Lundvall and Freeman, it tried to explain innovation and economic growth in evolutionary system. Afterwards the concept has been further developed into the so called "**National Innovation System**" (NIS), defined as an aggregation of different entities, which contribute in different way to the level of innovation of a determined country or region. Those different actors are: firms, universities, research centres, financial and governmental institutions and so on. This point, lead us to the problem that NIS approach presented, namely that it was not really able to explain and capture the interactions between components of the system at a more macro level of analysis. This is the reason why in the middle '90s the concept of **Regional Innovation System** came out. Basically the concept to apply remained the same, but the

level of analysis changed dramatically from a big context to an almost local one. Other forms of concepts were established between the end of the '90s and the beginning of the new millennium, by focusing even more in detail at micro level (Sectoral Innovation System and Technological System).
The main differences between these alternative models and the Triple Helix can be summarized as follows:

I. Little description of all the complex relationships and interlink between the different actors within the system. The set of organizations and institutions are described quite well, while the intra-flows between the same kind of organization or within the same industrial sector tend to be lost.
II. Loss of individual role perception during the innovation process. Firms, but more broadly all the institutions are seen as crucial factors in explaining the results of an innovation process. However, institutions tend to not be clearly defined; leading to some confusion and also the role of the individual innovator seems to be neglect.
III. The changing concept of boundaries. In the traditional innovation system, boundaries are clearly defined as geographical, or by industry sector or even by technology. In the TH model is no more important the definition of the boundaries themselves, but becomes fundamental the concept of permeability of boundaries. Individuals, organizations and institutions can freely move from one sphere to another one, creating the fertile land for the birth of hybrid entities and new type of innovative solutions/organizations.

Fractal Innovation Ecosystem

An alternative, and relatively new, way of approaching the issue of innovation systems is the one proposed in the so called Fractal Innovation Ecosystem. In this context words like networks, clusters, knowledge, overlap and flows become fundamental. This ecosystem aims at capturing the fast changing dynamics of nowadays globalized environment, focusing the attention to **knowledge** and **innovation** as crucial issues. However, going back to Schumpeterian theory is required in order to set the right prelude to the introduction of the model itself. That innovation ecosystem, in facts, finds its basis in the concept that everything flows and change is the only constant. Behind these notions, lies the Schumpeterian definition of creative destruction, as the force which constantly revolutionizes the economic structure from inside, incessantly extinguishing old one, while generating innovative new one. Thus, creative destruction is driving and shaping the development and lifecycle of technological trajectories and at the same time is helping the economic system to foster more sustainable entrepreneurship and robust competitiveness (see definitions in the next paragraph). In our time, research is strictly interconnected and is becoming less linear and more cross-disciplinary, in fact is said that the evolution is shifting from technology trajectories to market adjacencies. Furthermore, the notion of creative destruction should be analysed from knowledge economy and society perspective; as a knowledge-based and knowledge-driven phenomenon.

Actually, nowadays, **knowledge** is increasingly needed in order to get competitive advantage since firms gain competitive superiority by knowing something its competitors do not know or cannot replicate easily. Knowledge is considered increasingly as a crucial point for the

success and prosperity of nations, which in turn depends on how innovative and sustainable high-tech ventures are generated by the combination and connection of such knowledge. Learning is the other aspect that is becoming more and more important, because by undertaking learning activities companies are able to gain, accumulate and assimilate new knowledge. Later on, that knowledge will become the basis on which firms will create and improve "organizational routines" (Nelson and Winter, 1982) and contemporary develop the so called "dynamic capabilities" in order to cope with the ever-changing surrounding environment.

Taxonomy of fundamental concepts

There are several different crucial points that need to be defined in order to introduce the model itself, because they constitute they building blocks upon which the model is founded. The first one is ***Strategic Knowledge Arbitrage and Serendipity*** (SKARSE), which are potential innovation drivers in this model perspective. The former one regards the so called 'happy accidents' in learning: unplanned benefits of enabling knowledge to 'spill over' between employees, groups and functional domains. It refers to the capacity to identify, recognize, access and integrate knowledge assets more effectively and efficiently to derive, develop and capture non-appropriable, defensible, sustainable and scalable pecuniary benefits. The latter one is about the ability to exploit and spread the knowledge for applications other than the intended topic area: that is, the capacity to create, identify, reallocate and recombine knowledge assets more effectively and efficiently to derive, develop and capture non-appropriable, defensible, sustainable and scalable pecuniary benefits (Carayannis, 2013).

As briefly mentioned above, firms grow within an increasingly uncertain and dynamic environment in which they use the "new knowledge [they] derived through the healthy balance between competition and cooperation involving employees and business partners" (Carayannis, 2009). In this fast changing context the second concept to be defined is ***Real Options***. They are choices made under conditions of risk and uncertainty about tangible/intangible assets and are characterized by dynamism. Thus their evaluation cannot be considered as snapshot in a certain point of time, indeed the process need to be monitored, managed and evaluated on a continuous basis. Recalling what written before about SKARSE, knowledge serendipity will provide managers with the necessary tools to define the terms of real options, while knowledge arbitrage allows them to decide if, when and how best to execute them (Carayannis, 2008).

In the model the main components which play a central role are innovation networks and knowledge clusters. ***Innovation Networks*** are infrastructures (real or virtual) and infra-technology which serve to encourage creativity and invention in order to make innovation converge into a specific domain, whether it is public or private. ***Knowledge Clusters*** indeed are agglomeration of specialized, complementary and mutually reinforcing knowledge assets in the form of 'knowledge stocks' and 'knowledge flows' (Carayannis, 2008). They tend to exhibit self-organizing, learning-driven, dynamically adaptive patterns. This definition differs a little bit from the one of Michael Porter (1990), who first introduced the concept of business cluster as a geographic concentration of interconnected businesses, suppliers, and

associated institutions in a particular field. Here the focus is on knowledge as the main driver of the clusters, which explains why inside the broad category of knowledge clusters we find both geographic and sectoral clusters. In fact, they normally move across different geographic region and sectors, and by doing that knowledge clusters operate locally and globally as well (Carayannis and Campbell, 2009).

Since at the base of the model there is knowledge, learning skills and the activity of learning become fundamental, especially ***Technological learning***. This type of learning occurs at both individual and organizational levels, even if strategy for leveraging those learning must differ between individuals and organizations. There are three main levels of technological learning:

- *Operational Technological Learning:* accumulated experience and learning by doing
- *Tactical Technological Learning:* the learning of new tactics in the application of accumulated experience.
- *Strategic Technological Learning:* Very long term perspectives focusing on learn how to reshape, reinvent and re-engineer organizational tools.

For instance, suppose that a company is undertaking the decision of doing a Merger or Acquisition (M&A), as one of the main examples of 'creative destruction'. Operational learning in M&A means task-specific improvements related for example to more accurate firm evaluation or a better integration of human capital post-merger. Tactical learning instead refers to improvements over the entire M&A duration leading to a better overall management process. Finally, strategic learning is clearly related to the post-merger reality, since it is the most long-term perspective, with the goal of creating and improving synergies between the two companies.

The last concept to be defined is the so called ***3C***. That acronym stands for ***co-opetition, co-evolution and co-specialization.*** The first one refers to a balance of competition and cooperation in order to create new networks adjusted case by case. The second is mainly related to the creation of new knowledge together as a result of a series of interactions. The third one is the last behaviour normally observable, and occurs when individuals and organizations expand their knowledge/role/expertise in other fields in a complementary and mutually-reinforcing way. The capacity of integrating and combining different knowledge and innovation modes via a 3C approach, defines the superior competitiveness of a knowledge system.

The Fractal Innovation Ecosystem Model

Now that all the necessary concepts and definitions are been provided by the previous paragraph, the model can be introduced. **The Fractal Innovation Ecosystem** is based on the idea of the existence of a multi-level, multi-modal, multi-nodal and multi-agent system of systems. Such highly complicated system is constitute by innovation meta-network (networks of innovation networks and knowledge clusters) and knowledge meta-clusters (clusters of innovation networks and knowledge clusters), organized in a chaotic or fractal way. These in turn constitute agglomerations of human, social, intellectual and financial capital stocks and flows as well (Carayannis, 2008).

In a given ecosystem, company A and its competitor company B are competing and going through a so called organizational cognition spiral (OCS). In the first cycle of the spiral both companies learn; learn how to learn better and then learn to learn how to learn better. In this spiral of learning they developed new knowledge from competition and cooperation and reach the stage C1 (co-opetition). Afterward, as the two company grow, they will merge, fail or continue to compete, but in each case by experiencing again the OCS they create new knowledge as a consequence of interactions at various level and reach stage C2 (co-evolution). Then they will go through a third OCS and by doing so groups and individuals will develop knowledge in new areas and when it happens they have just moved to the third stage C3 (co-specialization).

Once the ecosystem has moved to this stage, firms that are able to be robust and competitive enough survive, the other have improved or disappeared. The whole system tends to stabilize, and few companies can lead it in the direction they want for a while. However, this is not an oligopoly, since the concept of robust competitiveness is open to creative destruction, using again Schumpeterian citation. New entrants can innovate in a disruptive way and enter into the market, moreover happy accidents and spontaneous event will lead the system to a critical mass of instability again. The introduction of this changes, add to the high presence of heterogeneity will destroy the balance created before; lead back to the co-opetition stage, but in new ecosystem.

The model could be seen as a further development of linear (classical) models of innovation or the triple helix model presented in the paragraph 2.5.2, with this last one presenting significant parts of overlapping with 'Mode 3' (The Fractal Innovation Ecosystem). In the table below are summarize how this model encompasses all the past theories and integrate a little further beyond the limits of the TH model.

TABLE 2.6: Mode 3

Concept	Attributes	Components
Mode 3	Mode 1	*Linear model of innovation: first basic research, then applied research and experimental development;* *First university research, then business R&D;* *Codified (explicit) knowledge;* *Technology life cycles;* *Long-time horizons.*
	Mode 2	*Interaction of knowledge production and knowledge use;* *knowledge production and knowledge use as the two referential key benchmarks;* *paralleling of basic research, applied research and experimental development;* *paralleling of university research and business R&D;* *chain-linked model;* *overlapping of different technology life cycles in different stages;* *shortening time horizons.*
	Mode 2 and Triple Helix overlap area	*Codified (explicit) and tacit (implicit) knowledge;* *networks; R&D and S&T networks;* *communication and negotiation;* *public/private partnership;* *hybridity; hybrid institutions, functions and markets;* *competition and cooperation: "co-optition";* *"entrepreneurial university" and "academic firm".*
	Triple Helix	*Three helices: academia (universities), state (public), industry (business);* *Communication within and between the helices;* *Non-linear dynamics, no a priori synchronization of the helices;* *University-industry-government relations;* *Tri-lateral networks and hybrid organizations;* *"third mission" and "second academic revolution";* *Increasing complexity of recombination;* *Three helices; basic research, applied research and experimental development.*
	Multi-Level systems: spatial aggregation	*National, regional and global innovation systems;* *"gloCal" (global/local) innovation systems* → *Subnational/local — National — supranational/transnational — Global*
	Multi-Level systems: conceptual aggregation	*Knowledge-based innovation systems;* *the leveraging of knowledge for the economy, society and politics through knowledge-based innovation systems;* *knowledge management and knowledge policy;* *partial replacement of economic policy by innovation policy.* *For example: the research-axis of knowledge* → *R&D — S&T — Knowledge-based innovation*

Source: Towards a 21st Century Fractal Innovation Ecosystem. Carayannis & Campbell, 2012.

The model could be useful in figuring out what are the nature and dynamics of your regional business and technology ecosystem, with the aim to enter the market when the ecosystem appears to be close to its critical mass of maximum likelihood knowledge serendipity and arbitrage ("happy accidents") events. In addition, it aims to help the ecosystem reach its maximum "happy accident" likelihood state (as a regional economic development manager and policy maker) as sustainably and fast as possible. In this context, the partnership between public and private sectors, in order to create new innovative networks, as well as the access to risk capital become fundamental pillars to sustain and simultaneously accelerate economic development.

2.1.3 POLICY IMPLICATIONS: MAKING ANALYSIS UNDER A NEW PERSPECTIVE

The implementation of the Triple Helix model generates many implications from the point of view of the policy maker. First of all, the different institutions have to encompass the old stereotype and start thinking beyond their own boundaries in order to reach a better harmonization and create a convergence of interests into win-win situations. That outcome could be accelerated thanks to top-down or bottom-up initiatives, but they need to find the enabling environment in order to flourish, which in turn need policy measures to *integrate innovation and entrepreneurship within the larger socio-economic context (Ranga and Etzkowitz, 2013).* Policy maker are mainly engage in practices in order to keep the delicate balance between R&D and non-R&D actors, and in particular ensuring the reaching of the critical mass of both of them. A possible way to do it is to map all the actors present in the territory and study their past performance and future trend, in order to understand where the government could help them. As always, a crucial role is played by the capabilities of some actors (especially SMEs and high-tech start-up) in order to be able to access capital funds and loans. Again, the financial aspect seems where Government sphere could have the most important impact.

At regional level, innovation policies have always focused on increasing the learning processes and capabilities in order to improve the competitiveness at local level. In other case, the focus was more towards the interactions between different actors in the innovation process, such as firms, universities, start-up companies and so on. All those efforts can be grouped into two main approaches to Knowledge-based regional innovation and development. The first one is (1) an **exogenous** strategy to attract innovative high-tech firms to relocate in the region, this attraction in same cases could be completely aligned with the strategy of attraction for FDI. *External investments as key inputs for regional development come in response to improved infrastructure, fiscal incentives and programmes provided by federal or state governments that aim to promote technology and high-growth entrepreneurship through public and private partnerships, stimulate growth in a designated region and the development of high-tech centres or science and technology parks (Ranga and Etzkowitz, 2013).* The second one (2) is **endogenous** and focuses more on creating a local basis of science and knowledge to create then a virtuous cycle, which will lead to the creation of knowledge-based companies and innovative products, processes and industries. The two approaches have behaved in a supportive way between each other and not on a mutually exclusive base. The Triple Helix model is based on the assumption of the continuous flow and movement from one sphere to another one and the capacity of the whole model to integrate the two different approaches and benefits from synergies, is based on the capability of the system to generate spaces.

Moving to Fractal Innovation Ecosystem, that model raised some interesting issues from governments' perspective, since by analyzing the socio-economic environment under SKARSE ideology the policy maker will be able to reevaluate its priorities. They should act as facilitators and resources, not as managers and operators, and try to equalize within the economic environment while supporting cooperation and networks creation. They have to make the first step, in leaving the old paradigm according to which nowadays the world's

biggest companies are more powerful than many of the world's governments and let them run the world for profit if they could. What stops them is not governments, but markets (Carayannis, 2013).

In order to ensure sustainability in the future, investments in research and innovation must be managed today and an increasing part of those investments are share among different actors simultaneously. Companies, for example, must manage intellectual property to manage research (access external IP vs profit from internal IP); researchers must become knowledge brokers and knowledge generators at the same time. Furthermore, science-driven academic research is becoming crucial, since scientists decide the basic research; but industrialists decide the applied R&D. In this scenario the role of the government like in the Triple Helix model is fundamental, by supporting the creation and cooperation of networks (hybrid organization) capable of merging together all the different interests proposed by all the different actors (behave as facilitator). In supporting this network creation and cooperation at all levels, governments will foster an aggregation phenomenon even at trans-national level (like EU). This point raises the interesting issue, whether in the future; there will be a propagation of supranational integration processes, implying a new stage in the evolution of politics. Where small and medium-sized nations become absorbed by supranational clusters, nowadays we could interpret globalization as the highest level of trans-national aggregation. Last but not least, the government could implement a strategic intervention as a resource provider for the purpose of reducing financial barriers and facilitating the access to credit, especially in relation to the creation of new innovative entities or networks.

Knowledge is becoming the fundament of our nowadays socio-economic development, which explains why it plays a crucial role in defining the fractal innovation ecosystem. The expectation is that, in the future, it will be observable a partial, and gradual, replacement of economic policy by knowledge and innovation policy. This continuum of transformations in terms of input and output of economic activity, joint with the shift from product-focused economies (tangible-based) to service-focused economies (intangible-reliant) will lead policy maker to rethink and eventually recreate the methods by which they support global, regional and national policies and practices related to economic development.

2.2 INTERNATIONALIZATION COMPONENTS FOR THE DOUBLE 'I' ENVIRONMENT

In order to deal with their internationalization, firms need to develop new competencies (Yeniyurt et al., 2005), especially strategic, managerial, and global knowledge competencies; since the internationalization achievements will partly depend on them (Fillis, 2001).The strategic competencies are related to the products (or services), provided by an organization, resulting in competitive advantage of the firms going international (Croteau et al., 2004). One of the key factors to succeed is the need for firms to carry out deep changes in its processes and strategies, enabled by managerial competencies. Moreover, the internationalization process requires firms to master information about the other agents

(customers, suppliers and competitors) within the market in order to well define its strategies.

There are strategic competencies that can be identified as drivers of competitive advantage, according to ease of doing business, and ability to recognize technology opportunities and capitalize them.

Managerial competencies, in previous literature, are measured by the organizational capabilities such as the capability on management of change and development of organization and human resources (Swierczek, 2004). While knowledge competencies can be based on the information process on the other actors (Yeniyurt et al., 2005). The following table reports how to measure the different aspects of international competency.

TABLE 2.7: Measuring International Competencies

Competence	Indicator	Operationalization	Researchers
1. Strategic or entrepreneurial competencies	Focused approach of doing business	Knowledge, know-how, and skills are translated to distinctive capabilities	Norvell et al., 1988; Croteau & Taymond, 2004
2. Management or managerial competencies	Organizational capability in terms of manager skills	Organizational structure	Iain S. Henderson (2005)
		Changes Management	
		Organizational and human resources development	
3. Global knowledge competencies	Market orientation (measured at organizational level)	Intelligence/information generation	Kohli & Jaworski, 1990
		Intelligence/information dissemination	
		Intelligence/information responsiveness	
	Market orientation (measured at behavioural level)	Customer orientation	Narver & Slater, 1990
		Competitor orientation	
		Inter-functional coordination	
	Knowledge process	Acquiring information	Huber, 1991; Sinkula, 1994
		Interpreting information	
		Integrating information	
	Information process on	Customers	Yeniyurt et al., 2005
		Suppliers	
		Competitors	

Source: *Strategies for Internationalization: A Comparative Study of Thai and Vietnamese Companies in Two Industries.* Thi Kim Ngoc PHAM, 2008.

Following the development trend of ASEAN countries, internationalization has become increasingly important in order to lure strategic management, international business and researchers.

Assuming that firms lack knowledge about foreign countries and to be inclined to avoid uncertainty, they choose export activities as a first step towards internationalization (Johanson, and Paul; 1975). Firms start exporting to neighbour countries (culturally or geographically). Internationalization through networking can be achieved by establishing and building relationships in new markets and by linking to existing networks in other countries. Accordingly, internationalization is driven by the creation and exploitation of the firm's network rather than through the existence of particular strategic advantages. As it will be explained later in this report, such networks become fundamental also for innovation and a lot of models will talk about networks as a fundamental pillar for their reasoning.

Developing an international strategy is a process of incremental adjustment according to the changing conditions in the firm and the environment (Yip et al., 2000). When firms' home markets become stagnating and foreign competitor's forces grow, they will need to develop an internationalization strategy (Kühn and Grünig; 2006) as they plan to enter different foreign markets. Following there are several different entry modes into foreign market/country, together with their definition.

TABLE 2.8: Foreign Entry Mode

Entry Modes	Definition
Exporting	Refers to shipping products/services produced in the company' home country to other countries for marketing. This is a good way to minimize risk and experiment with a specific product.
Licensing	The licensing firm gives the right to another firm in the host country to produce and/or sell a product under a licensing agreement. This option is useful strategy for the company that has a very well-known trademark or famous brand name, but it does not have sufficient resources to enter foreign market directly.
Franchising	The franchiser gives the right to another company to open a retail store using a franchiser's name and operating system under a franchising agreement.
Joint Venture	Companies form the joint ventures to combine the resources and expertise needed to develop new products or technologies. It is the most popular strategy used to enter a new country, especially to enter a country that restricts foreign ownership.
Acquisitions	Purchasing another company already operating in a host country. It is a quick way to move into a foreign market.
Green Fields Development	A company builds its own manufacturing plant and distribution system in the host country.
Production Sharing	Is the process of combining the higher labour skills and technology available in the developed countries with the lower cost labour available in developing countries.
Turnkey Operation	Are the contracts for the constructions of operating facilities in exchange for a fee. The facilities are transferred to the host country or firm when they are complete.

Build-Operate-Transfer concept	It is a variation of a Turnkey operation. Before transferring the completed facilities to the host country at little or no cost, the company operates these facilities for a fixed period of time to earn back its investment, plus a profit.
Management Contract	A company can use its personnel to assist a firm in a host country for a specified fee and period of time. The company can earn some income from its investment and keep the operations going until local management is trained.

Source: Wheelen & Hunger, 2000

2.2.1 MEASURING INTERNATIONALIZATION

Internationalization can take many forms and involve different agents. Its main components range from trade to direct production (through FDI), portfolio investment, alliances between companies located in different countries and so on (Ietto-Gilliess and Seccombe-Hett; 1996).

In particular, some scholars have identified two main dimensions of internationalization (Hassel et al.; 2003): production activities of firms abroad, and corporate governance dimension of firms (financial internationalization). The first one is the most acknowledged, but the second is gaining visibility and relevance. On one hand, research on "real" internationalization (share of foreign activities) is focused on FDI and location of production (Caves; 1996). On the other, "financial" internationalization (orientation towards international financial markets) is focused on the impact of foreign exchange rates on investment decisions (Caves; 1998).

It is important to highlight that MNCs are seen like the main agents responsible for internationalization since they are involved in all the components of international integration. In fact, by definition, MNCs control and manage production establishments in more than two countries. However, there is no one-size-fits-all strategy to assess the internationalization degree of companies or countries. In fact, it all depends on the specific patterns and aspects we want to analyse about internationalization process.

Late literature provided three main indices on the degree of internationalization: the *Transnationality Index* (UNCTAD), the *Transnationality Spread Index* (Ietto-Gillies; 1998), and the *Degree of Internationalization* (Sullivan; 1994).

The *TNi* is composed of an average term of the foreign share in sales, employment and assets. It is calculated for the 100 biggest MNCs in the world, and does not distinguish between local and foreign activities as major drawback. This issue is proposed to be solved computing the product between *Tni* and *Nsi* (*Network Spread index*), which can be derived by dividing the number of foreign countries in which a company has affiliates by the total number of countries worldwide in which there is FDI stock inward "minus" 1 (degree of freedom, to exclude the home country). This combined index, the *Tsi*, is supposed to encompass both the volume and the dispersion of foreign activities. The last index reported, the *DOI*, is a scale drawing upon available data for 74 of the 100 most international American manufacturing and service firms (Forbes ranking), based on total foreign activities (Sullivan; 1994). This has been criticized for resulting from the combination of different levels' measures although it results to support construction validity.

The main conclusion reported is that there is no unique and correct index since each index may result more or less appropriate for a specific task or framework (Ietto-Gillies; 2008).

2.2.2 INTERNATIONALIZATION THEORETICAL MODELS

The Uppsala model

The most traditional way of describing the internationalization process is by the Uppsala internationalization model (Johanson and Wiedersheim-Paul, 1975; Johanson and Vahlne 1977). According to this model, a firm often starts going international by exporting directly to a foreign country. Then, it starts exporting with the help of independent representatives agents abroad (indirect exporting). Next step consists in improving sales divisions in a foreign country. In the last step, the firm sets a production facility abroad.

The model is based on the assumption that one cycle of events represents the input of the next. Accordingly, the current internationalization level is a crucial driver of further internationalization.

This theory is widely accepted but, after its first formulation, a need for development of the original model emerged. Initially, when for example large firms have surplus resources, they can be expected to make larger internationalization steps. Then, in a situation when market conditions are stable and homogeneous, it might be possible to acquire important market knowledge in other ways than through experience. Finally, a firm may get significant experiences from markets that have similar characteristics and may thus generalize this experience to the specific market. According to Rasmussen's theory (2001), the 3 leading factors towards a faster internationalization are: new market conditions, increased specialization demanding larger markets and a quick spread of innovations, and more elaborate people capabilities.

However, in several studies, during the nineties, it has been identified an increasing number of firms that do not completely follow the traditional internationalization patterns. Such companies have been called "global start-ups" (Oviatt, and McDougall; 1994), "high technology start-ups" (Knight, and Cavusgil; 1996), "international new ventures and born global" (Rasmussen et al.; 2001).

Alternative approaches

A different approach, from a network perspective, has been provided by Welch and Luostarinen (1988) who define internationalization in terms of the "increasing involvement in international operations" (*Inward-outward internationalization model*). Thereby they assert that both inward and outward international operations must be taken into account when analysing an internationalization process. According to this model, inward flows like importing raw materials and machinery proceed exporting. Then, knowledge acquired by importing can be used when starting exporting. The network approach of internationalization is often applied on vertical relationships (sellers-buyers). However, the relationships between competitors are both complex and important but they have not been deepened to the same extent (Bengtsson, and Kock; 1999 and 2000). They call for more research in the field of horizontal business networks, in order to get a deeper understanding of how to manage multidimensional relationships and the potential benefits from relationships between horizontal firms.

Cost-Benefit-Analysis of Internationalization Opportunities

Previous literature has identified the following features as benefits most commonly associated with internationalization:

1. Economies of scale and scope resulting from a larger and more diversified geographical presence, leading to lower fixed costs among operations in different countries (Contractor et al., 2003);
2. Higher ability to supply to international clients thanks to greater physical proximity (Cyrino and Barcellos, 2006);
3. Higher learning or international experience effects (Cyrino and Barcellos, 2006);
4. Access to cheaper or scarce resources in foreign countries (Cyrino and Barcellos, 2006);
5. Higher capacity for global monitoring of a business environment (Contractor et al., 2003);
6. Higher ability for cross-subsidization and price discrimination and the potential for arbitrage with an increase in the geographic scope of the operation;
7. Improved reputation as a result of a 'demonstration effect' that the company achieves in its home markets (Cyrino and Barcellos, 2006).

With regards to the challenges firms have to face in the internationalization process, such as risks and expenses, the literature has identified:

1. An increase in the overall costs of coordination and governance, due to the increasing complexity and diversity of international operations (Cyrino and Barcellos, 2006);
2. *Foreign liability*, that is the lack of knowledge and difficulty in dealing with very different market and cultural contexts that are very different from the country of origin (Zaheer, 1995).
3. *Liability of newness*, which involves the costs of purchasing and installing facilities, as well as the costs of establishing internal management systems and external business networks. (Lu and Beamish, 2004).

Furthermore, other benefits, especially related to innovation, could be:

- Potential innovation spillover from a highly innovative region to the companies engaged in international activities (Audretsch and Feldman; 2003).
- Leverage from local R&D capabilities with possible joint ventures/joint labs (Karabag and Berggren; 2013).

2.3 ENTREPRENEURSHIP AND INNOVATION ECOSYSTEM

The entrepreneurship culture is the main value that embodies and implements the Double 'I' environment approach and is responsible of a vibrant local ecosystem. Keeping as sources, innovation and internationalization, the entrepreneurial culture becomes fundamental in order to implement them in reality and lead to a true local economic and social development. As it will be analysed later, the main business agents which operate under the conditions of a Double 'I' Environment are Small and Medium Enterprises and Multinational Companies. Behind them, the entrepreneurship culture is the main driver for their creation.

In order to meet the increasing challenges of the business landscape, it is essential to promote a culture improving economy's competitiveness through high-impact programs that create and support the virtues of starting a business and innovation as key tools for economic and social development. Entrepreneurship represents an irreplaceable value in order to enhance economic development, for three main reasons:

1. Entrepreneurs drive innovative processes underlining the development of products and services meant to improve people's wellbeing;
2. Entrepreneurs run successful businesses which lead to increasing employment opportunities and savings accumulation;
3. Entrepreneurial values create a new cultural environment by changing, innovating and internationalizing which, in doing so, leads a highly positive impact on civil society.

Everyone can innovate, but with which purpose? An innovative business can bring about different benefits like saving time and money, and giving a competitive advantage to grow and adapt business in the changing marketplaces. In general, innovation relates to changing or creating more effective processes, products and ideas, increasing the likelihood of business success. It creates more efficient work processes and better productivity and performance.

2.3.1 ENTREPRENEURIAL ECOSYSTEM

Following Vogel's definition (G20 YEA Summit 2014 in Sydney), for an entrepreneurship ecosystem, we mean *a **dynamic, interactive community** within a geographic region, composed of varied and **interdependent actors** (e.g. entrepreneurs, institutions and organizations) and **factors** (e.g. markets, regulatory framework, support setting, entrepreneurial culture), which **evolves over time** and whose actors and factors coexist and interact to promote new venture creation.* Just like every ecosystem, an entrepreneurial ecosystem is composed of several features, which are believed to significantly affect entrepreneurial activities in a specific ecosystem (figure below).

Figure 2.8: Entrepreneurial Ecosystem Map

Source: P. Vogel, 2013.

Different factors and actors can be identified either by a non-entrepreneurship specific level or an entrepreneurship-specific level. That said, an entrepreneurship ecosystem can be described by the three main categories that it encompasses:

1. Infrastructure, governments and regulations, markets, innovation (**non-entrepreneurship level,** TABLE 1.9);
2. Financing, entrepreneurial education, culture, networks, startup support and exposure of entrepreneurs (**entrepreneurship level,** TABLE 1.10);
3. Entrepreneurial actors (individual-level component).

TABLE 2.9: Non-Entrepreneurship-specific level

Government & Regulations • Policy framework • Immigration and labour law • Property rights • Freedom of people • Regional economic development **Geographic Location** • Liveability in the area • Cost of living **Markets** • Customers (including beta users and early adopters) • Competitors • Distribution channels • Suppliers • Large corporations (as customers or strategic partners)	**Infrastructure** • Physical infrastructure • Educational institutions (e.g. universities) • Energy, telecom & ICT • Transport & logistics • Workplace **Innovation** • Knowledge & skill creation • Research & development • IP • Published scientific papers • Technology transfer • New processes and methods

Source: *the Employment Outlook for Youth: Building Entrepreneurial Ecosystem as a Way Forward*, 2013. P. Vogel.

TABLE 2.10: Entrepreneurship-specific level

Financing • Accelerators • Business angels / FFFs / VCs • Loans / grants / debt • Micro financing • Private equity • Smart capital • Crowd funding **Culture** • Mindset / ambition / drive / creativity • Role models • Self-promotion skills • Social status of entrepreneur • Tolerance of failure & risk • Tolerance towards success **Visibility** • Events & meet-ups • Conferences • Startup awards / labels • Media / newspapers / internet	**Support** • Accounting & legal • Mentors & coaches • Experts & consultants • Export support • Labour & talents • Information hubs • Cluster / Tech Parks • Foundations **Education** • Entrepreneurship degree • Skill training & certificates **Networks** • Formal networks: organizations, institutions • Informal networks: friends, families, colleagues • Entrepreneurship associations & organizations • Group networks (e.g. women entrepreneurship networks)

Source: *the Employment Outlook for Youth: Building Entrepreneurial Ecosystem as a Way Forward*, 2013. P. Vogel.

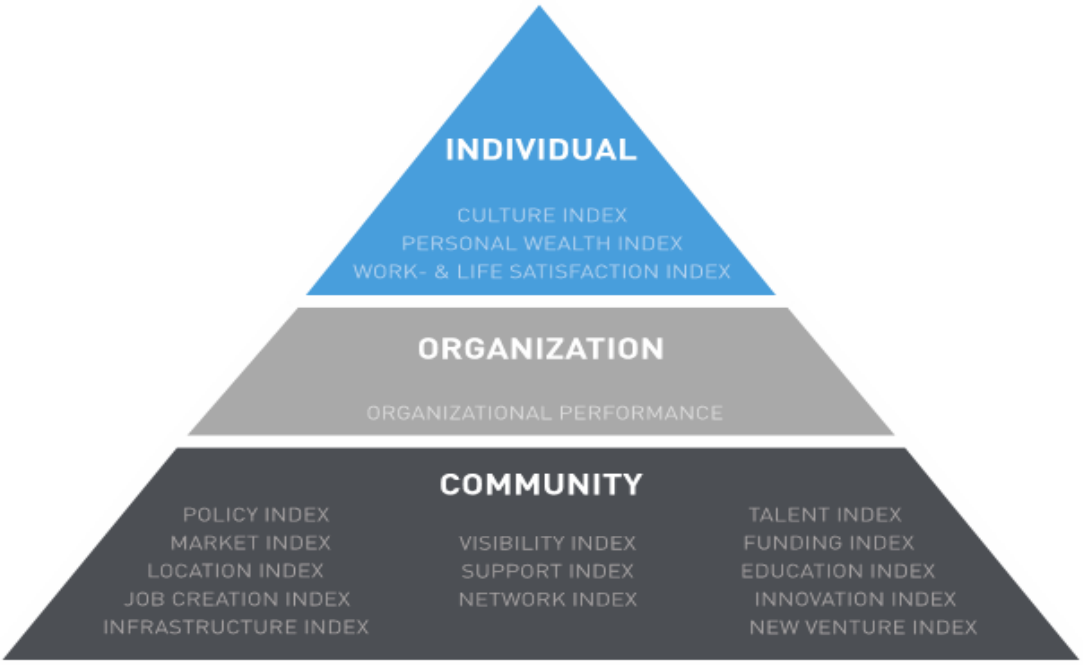
Ecosystem Index

There are several research projects and secondary data sources, studying various national economic indices, which are used to supplement and cross-validate primary data collection. In particular, a scientific approach, aimed at assessing entrepreneurship may be based on:

1. Primary data: historical data of cities and regions; map, classify and analyse supporting organizations; measuring performance; match between the regional USP and the pattern of ecosystem dimensions;
2. Secondary data: National statistics offices, Chambers of commerce, Companies Registrars, WB Doing Business Report, Heritage Freedom Index;
3. Methodological approaches: Spiderweb charts; Benchmarking; Qualitative Comparative Analysis.

Without measuring the effectiveness of the different features within an ecosystem, we cannot improve existing programs and carry out new and complementary programs. Several indices have been created for this purpose, that is to rate and assess innovation ecosystems on three main levels: individual, organizational, and community. From these levels, an ecosystem index (figure below) is created to rank and compare ecosystems from around the world.

Figure 2.9: Ecosystem Index

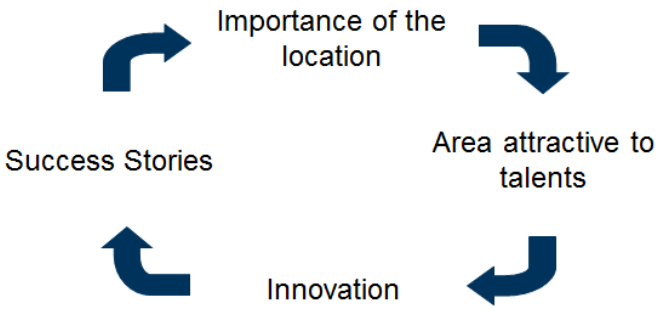


Source: P. Vogel, 2013.

Starting an Ecosystem

Moving to the very first start of an ecosystem, Vogel presents the ecosystem formation as the following positive vicious circle:

Figure 2.10: Vicious Circle for Starting an Ecosystem



Source: *P. Vogel, 2013.*

Trying to develop an entrepreneurial ecosystem is complex, cost-intensive and risky, and requires expertise as well as patience. Policymakers and other stakeholders who try to generate this kind of ecosystem should follow some basic guidelines.

In particular, willing to create an entrepreneurial ecosystem entails some significant consideration:

- Each ecosystem is unique given its several different components;
- Joint initiative with both, bottom-up entrepreneurial dynamics embedded and supported by governments and institutions.

- Holistic approach (implement as many of the elements of the ecosystem in parallel as possible);
- Multi-stakeholder approach;
- Coordination and screening;
- Bureaucracy blocks innovation.

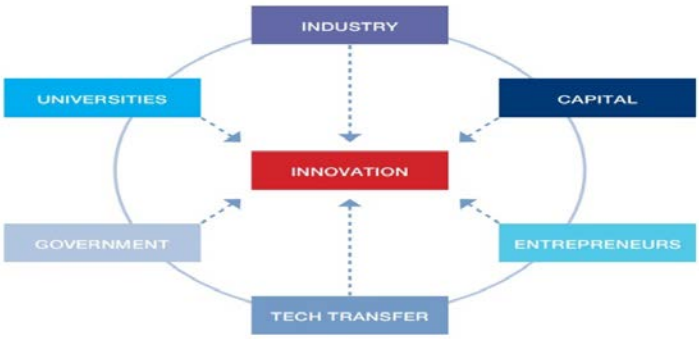
Finally, in order to promote innovation, major actors of entrepreneurship ecosystem should fulfil the following main objectives.
First, **governments** should: promote entrepreneurship as driver of economic growth, remove the stigma of failure; create networking opportunities; and ease access to financing.
Second, **entrepreneurs** should: share stories both of success and failure; and help future entrepreneurs.
Last, **incumbent firms** should: promote incubators and accelerators; collaborate with universities aimed to long-term strategic M&A; and recognize the contribution and success of entrepreneurs.

Future research could be aimed at understanding:
1. Which components constitute an entrepreneurial ecosystem;
2. Whether certain components result more important than others;
3. Whether there is a temporal dependency of the importance of individual components;
4. How different entrepreneurial ecosystems evolved historically;
5. Which stages outline the development of an entrepreneurial ecosystem and how the paths differ depending on the type of ecosystem.

2.3.2 INNOVATION ECOSYSTEM

The innovation ecosystem is a key component of the entrepreneurship ecosystem. It consists of various institutions, jointly and individually, contributing to new technologies development and dissemination, and providing the regulatory framework affecting the innovation processes. In this system, growth and success can be attributed to the unceasing formation of specialized entities supporting and interacting with each other. The dynamics of the ecosystem is based on flexible recycling of professionals, ideas and knowledge.

Figure 2.11: Innovation Ecosystem Partners



Source: *P. Vogel, 2013.*

The literature often defines innovation as new ideas, improvements or solutions applied to achieve useful outcomes (Bessant, and Tidd; 2011). The term combines two terms: the former refers to the relation between living things within their environment, the latter stands for an organized body.

Applying ecology to management and organizational studies enables an ecological point of view of human organizations' studies. In doing so, these organizations are seen as people communities competing and, or, cooperating to obtain resources from community environments (Monge et al. 2011). The ecological viewpoint emphasizes environmental resource niches and adaptation as crucial drivers of the community and dynamic evolutionary processes. The study of innovation ecosystems can be seen as an extension of the research applying ecological perspectives. In particular, using these analogies, innovation ecosystems are increasingly no single actors' issue, but of actors interacting in a given environment.

Thus this kind of study is what constitutes a complex set of innovations and communities, and their interactions (Wang, 2009) since, in fact, innovations success usually depends on many types of complementary innovations (Adner, 2006). As a result, an ecosystem allows firms to create value that no single firm could make alone. Ecosystem perspectives extend the cooperation beyond bargaining over the value capture of each actor and includes considerations of challenges that different actors need to overcome to create new value (Adner, and Kapoor; 2010).

Ecosystem thinking has also been applied at national level (Carayannis, and Campbell; 2012). Yet, there are people who argue that eco-thinking does not really capture the distinction between innovation events and structures, going beyond them to integrate innovation activity in companies and organisations since labour division and innovation environment are not biological and adaptive but social and historical processes with contradictory and uneven relations of power (Papaioannou, 2007).

We can identify some focal points suitable to enhance an innovation ecosystem by Barclays report (2013) within *The Economist Intelligence Unit*.

TABLE 2.11: RECOMMENDATIONS FOR A SUCCESSFUL INNOVATION ECOSYSTEM

Policy makers should	**Business leaders should**
• Increase cross-border collaboration • Build innovation centres (including commercial focus) • Create "*cultural self-confidence*" (mostly for young people) • Ensure a friendly regulatory system • Encourage "*balanced risk-taking*" (through financial incentives and lower barriers to innovation) • Reform education system to meet the	• Combine financial support with commercial mentorship • Support the government in creating a modern labour force • Exploit opportunities in developing countries

knowledge and skills level required for innovation and entrepreneurship • Support successful domestic entrepreneurs (to nurture entrepreneurial culture) • Recognize which startups are more likely to succeed and the main channels aimed to that	

2.3.3 BUSINESS AGENTS

The report will analyse the business environment features and potentialities according to the prospects and perspectives of two main agents (private sectors), SMEs and MNCs, two kinds of enterprises characterized by different distinctive features but whose initiatives look increasingly to converge (cooperation, micro-multinational companies, etc.).

Small and Medium Enterprises

SMEs constitute the backbone of the economy. They are different from large firms because of three main features: uncertainty, innovation and evolution. SMEs often represent the starting point of economic development towards industrialisation.

They have a significant effect on the income distribution, tax revenue, and employment, efficient utilisation of resources, and stability of family income. Moreover, they have a propensity to employ more labour-intensive production processes than large firms. Accordingly, they considerably contribute to economic growth and development by generating employment opportunities and income. SMEs tend to be very entrenched in their local environment. On the one hand, they help promote the local economic development and social stability; on the other, local context fosters the development of SMEs.

In OECD countries, more than 95% of firms are micro, small, and medium enterprises, amounting to around 55% of GDP. On average across these countries, the number of firms employing less than 20 people exceeds 80% of the total, with numbers oscillating from 69% of the Russian Federation to above 95% in the US, Ireland, Czech and Slovak Republic, Korea and Greece (OECD Factbook 2014). Worldwide, SMEs are inclined to be more labour intensive and thus significantly contribute to employment. Between 2002 and 2010, on average, 85% of total employment growth was attributable to SMEs (World Bank).

Furthermore, a recent phenomenon in relation to SMEs is their growing internationalization pattern. *The rapid globalization enables SMEs to expand their businesses to international markets and use as an important strategic option to achieve growth (Meng & Cerini, 2014)*. Obviously the reasons for such internationalization activities are different between developed and developing countries, but what it is clear is that those activities are no more related only to MNCs.

A detailed analysis of SMEs internationalization, innovativeness, opportunities and hindrances will be provided in the third chapter.

Multinational Companies

Multinational companies are organizations that own or control production or services facilities in one country (or more) other than the home one. They arise because capital is much more mobile than labour. For example for costs advantages related to cheap labour and inputs, or for better market access overseas, MNCs establish subsidiaries in other countries.
They are identified by different dimensions and perspectives: ownership, management, strategy and structure, and so on. The company becomes multinational when it begins to plan, organize and coordinate production, marketing, R&D, financing, and staffing. In particular, MNCs differ from other firms by higher R&D expenditure, firm size, and foreign trade intensity (Grubaugh, 1987).

Foreign direct investment is one of the diverse approaches a business can use to enter foreign markets, consisting of foreign distribution of products through an affiliate entity and foreign production managed by parent firms headquartered in other countries. It could become very useful as a means to bypassing protective instruments in the importing country.

The choice between exports and FDI depends on profitability and growth opportunity, production cost levels, and economies of scale. If large scale productions lower the unit cost, it is better to focus production in one place. To choose the right option, managers are likely to look at the Minimum Efficient Scale (Root, 1994). This is defined as the minimum rate of output at which average cost is minimized. If MES is not achieved (there exists excess capacity), then companies opt out to export. Creating another plant overseas is pointless when domestic capacity is not fully employed. Conversely, if foreign demand exceeds the MES, then companies opt out for FDI.

However, while firms usually start exporting, they prefer establishing a production facility in the foreign market after having become familiar with it. This allows firms to avoid suffering from trade hindrances and domestic currency appreciation (reducing exports competitiveness).

FDI can be identified either by the investor or host country perspective. From the first point of view, it can be classified as horizontal FDI, vertical FDI, and conglomerate FDI. The former one is focused on product differentiation, since it aims to horizontal expansion in order to produce similar types of goods in the host country as in the home country. On the other hand, the vertical type aims to exploit raw materials. The latter one involves both of horizontal and vertical FDI.

Furthermore, two main forms of FDI, Greenfield investment, and Mergers and Acquisitions, exist depending on various firm-specific, host country-specific and industry-specific

determinants. A Greenfield project lacks any constraints imposed by prior work. This form of investment occurs when the firm establishes new facilities in the host country (where no previous ones exist). It is usually well seen since it represents potential for new job opportunities and additional value.

Government in developing countries often offer prospective companies tax-breaks, subsidies, and other types of incentives to set up Greenfield investments since they see losing corporate tax revenue as a small price to pay in order to create job opportunities and gain knowledge and technology boosting the country's human capital.
Merger and acquisitions are both aspects of strategic management dealing with the buying, selling, dividing and combining of different companies and similar entities that can help a company grow rapidly in its sector or location, as well as in new ones, without creating a subsidiary or using a joint venture. M&As can be defined as a restructuring activity leading to some entity reorganization with the aim to provide growth or add value. M&A are favoured by firms and markets presenting the following characteristics (UNCTAD, 2000): lower R&D intensity, high diversification, large size, capital market imperfections and crises, slow growth of an industry. From a legal point of view, a merger is a legal consolidation of two companies into one entity, whereas an acquisition occurs when one company takes over another and completely establishes itself as the new owner (the target company keeps existing as an independent legal entity controlled by the acquirer).

A detailed analysis of multination companies' trends and actions will be provided in the fourth chapter of the report.

Other Agents

Furthermore, an essential role is played also by other agents, such as the international organizations, which serve many diverse functions: collecting information and monitoring trends, delivering services and aid, and providing forums for bargaining and settling disputes. However, most of all, they provide political institutions through which states can work together to achieve common objectives, and set guidelines to support single and groups of countries to achieve general wellbeing and other purposes. In the Annex 1, the organizations whose guidelines are most mentioned in the report are briefly described.

CHAPTER 3

SMALL AND MEDIUM ENTERPRISEs

OECD's late outlooks present SMEs performances and policies, analysing their main trends, since they are seen like the core of future economic growth. Productivity growth is driven by competitive processes in industry which are, to a wide extent, based on the establishment and failure, as well as the entry and exit of smaller firms. They are a source of new jobs and important contributors to high-technological innovation involving local research centres. Moreover, they are relevant for local development and social cohesion. However, less than one half of newly small businesses survive over five years and only a small number develops into high-performance firms. Therefore, governments could adopt policies aimed at optimising the small firms' contribution to socio-economic wellbeing.

SMEs are non-subsidiary, independent firms which employ a restricted labour force (OECD, 2000). The exact definition varies across countries. The most common upper limit designating them is the 250 employees used in the EU. Nonetheless, there are countries setting it at 200 employees, while the US considers SMEs firms with fewer than 500 employees (US). Small firms are generally composed by less than 50 employees, whereas micro enterprises have at most ten, or at times five, workers. Even annual turnover is used to define SMEs. In the EU, SMEs must have an annual turnover not over € 40 million and/or a balance-sheet valuation not over € 27 million.

In OECD countries, most enterprises are SMEs, and average firm size is declining. In the US and Japan, SMEs have had relatively large workforces, but their average size is falling due to larger firms downsizing, to focus on core competencies and delegate other functions. Most SMEs are small or micro enterprises. In the UK, 99% of businesses have less than 50 employees, while in Canada, 94% of businesses have fewer than 20 employees. Micro-enterprises (less than ten employees) constitute at least 90% of firms in several countries, including Denmark, France, Ireland and New Zealand. In Australia, 84% of businesses have less than five employees. However, the report does not take into account the latter ones since they are not involved within the internationalization processes.

SMEs prevail in service sectors (construction, wholesale, retail trade), but they also play a key role in strategic business services, especially R&D, business organisation and human resource development. High growth in these sectors is mainly due to developments in the IT sector enabling small firms to dominate market niches.

3.1 THE ROLE OF SMEs IN THE DOUBLE 'I' ENVIRONMENT

In the present changing landscape, the true challenge, for policy makers as well as for business leaders, is to create a sound and competitive business environment in which firms of all sizes can well-perform. Aiming to this target, they need to:

- Enhance regulatory framework;
- Promote entrepreneurship;
- Support innovation;
- Facilitate access to the market;
- Facilitate access to financings.

Almost all the points presented here can be targeted to SMEs as well, with the third and the fourth points that could be linked closely to the double 'I' environment. The underlying idea is that SMEs are the complementary part of the market (with MNCs), but have the highest impact in social terms, especially for jobs creation. In particular, two thirds of the newly created jobs are owed to this sector, since the creation costs associated to new jobs are reduced compared to the ones involved within MNCs. The SMEs represent a factor of balance at the micro and macroeconomic level. In fact, since they have mainly as correspondent the middle class in the society, SMEs counterbalance the monopoles and oligopolies, reducing the MNCs' capacity of controlling the market (Zaman, 2007).

The worldwide experience asserts the unique contribution of SMEs to the economic development of national economies. After the ascension of the last three decades, it is thought that they will be the main driver of the economic progress, in the next period, both in the developed and in the transition countries. Their innovative and international attributes locate this type of organization in the focus of economic development. The final aim of the double 'I' environment is the local development of the region/nation implementing it. SMEs are considered as one of the main driver of this economic growth, provided the fact that they are correctly empowered. In that environment SMEs that are contributing to the local development are the one that are engaging in high innovative activities, largely due to their high flexibility. In this context startups play also a crucial role, as a big catalyzer of innovative activity at a micro level (see paragraph 3.4).

The other main side of the double 'I' is related to the internationalization pattern of SMEs. Although it was always regarded as a characteristic of MNCs only, nowadays the situation is changing and more and more SMEs are starting to engage international relationships on different levels. This issue will be better explained in paragraph 3.1.2, where the latest trends on this new international behaviour of SMEs will be presented.

Political strategists have often thought that the SMEs can represent the starting point of economic recovery since it contributes to employment and income generation as well as export revenues. However, in order to exploit the potential of SMEs for economic development and poverty reduction, transition and developing countries and their development partners (SMEs themselves) need to address some strategic challenges. First, the domestic SME private sector is expected to expand, through the creation of new and innovative firms and the graduation of as many informal enterprises as possible into the formal sector. Then, SMEs are likely to become more competitive and productive at their home base. Last, at least a small portion of these nationally competitive SMEs succeed in reaching a competition level that enables them to integrate into the global value chains

through trade, internationalization and investment, including linkages with FDI. This will conclude the idea of double 'I' environment, where both the component of it (internationalization and innovation) are implemented and included in the SMEs sector, leading the country to reach a powerful development.

Dealing with these challenges is becoming increasingly complex because of globalization. On the one hand, globalization has the potential to open up access to new markets, technologies, skills and capital for SMEs; which could result in an additional boost to the (Double "I") environment proposed. On the other, further economic integration brings with it a strong increase in competition from imports, the entry of new foreign investors and the strengthening of domestic, large firms starting to take over traditional, mostly local, SME markets. Since trade barriers and transaction costs (transport and communication) fall, value is needed to be added to SMEs products in order to keep growing and competing. Consumer demand is changing rapidly as incomes rise and choices increase when imported products become easily available in domestic markets. Technological progress creates new processes and products and transforms almost every business stage (production, marketing, sourcing, and logistics). New rules have been introduced in the multilateral trade system and foreign buyers require SMEs to fulfil higher technical, environmental and labour requirements in domestic and export markets. Since MNCs are looking for new markets and investments, capable SMEs have the opportunity to insert themselves into global value chains through subcontracting linkages, while those that are unable to do so increasingly face the danger of going out of their market. Competition is intensifying too. Against this scenario of increased global competition, SMEs, supporting institutions and governments in transition and developing countries, have to correct their strategic plans and make up new drivers of SME competitiveness (DI environment).

SMEs development strategies will necessarily be country and context specific. Each country will have its own challenges, opportunities and priorities for change. Resources availability will vary by country, and so will do the achieved results. However, the SME development features related to innovativeness and internationalization seem to hold independently of region and level of development among countries.

Micro-Multinational Companies

'From their first day on the job, micro-multinationals can access international markets - once the exclusive domain of corporate giants' (Mettler and Williams, 2011).

As already written, the world is changing very quickly for corporations as well as for the individuals who work inside them and the role of SMEs is crucial in creating added value and jobs in the economic system. If they are the engine of the economies, the role played brings even stronger results when coming to "micro-Multinationals". Internet enables mMNCs to have both an exceptional know-how and the ability to distribute worldwide.

However, these companies are sharply different with respect to typical SMEs only using ordinary web tools to develop its business worldwide, and are not even just smaller MNCs. A micro-Multinational company is an organization that implements a scalable, repeatable and profitable business model on a global scale. Specifically, following the definition provided by *The Lisbon Council for Economic Competitiveness and Social Renewal*, it is a multinational small business that operates across geographic borders and does not wait to grow up. Six mutual key factors are identified among mMNCs: **1.** Strong and powerful online presence; **2.** Customer centric approach; **3.** Stable globally-scalable services; **4.** Staff deployed globally and/or very mobile; **5.** Investment in

3.1.1 SMEs IN THE LOCAL INNOVATION ECOSYSTEM

R&D is one of the main ingredients in innovation. Developing and employing new technologies can help firms generate innovation, which in turn helps to gain market share and increase profits by outperforming competitors. However, R&D investments entail costs and risk. Thus any firm will have to balance between expected benefits from success and expected costs from failures.

The SME sector (more than ten employees) is highly active in R&D and its expenditure on R&D has increased substantially in real terms. Data reveals that the proportion of innovating businesses tends to increase with business size, but the proportion of small businesses that are innovating either products, services or processes has recently increased. There has been significant innovation by medium-sized enterprises.
Literature surveys show that the main motivation for SMEs to innovate is to improve productivity, increase revenue or increase responsiveness to customer needs. In other words, it could be said that SMEs on average tend to focus more on what the literature call *process innovation*. From an economic perspective, this type of innovation by definition saves on some inputs, which could be either labour or capital. By lowering the cost of production the company will be able to produce more output or produce the same quantity at a lower price. Those motivations matter more than all other potential drivers of innovation, including desire to increase market share, desire to increase export opportunities, high degree of price competition in the relevant product market, and a desire to be at the cutting edge of industry.

Specifically, technology represents one of the most important key sources explaining the success of SMEs. Technology is acquired through R&D. Companies with intense R&D tend to be more competitive than others in the global market, and are more likely to survive during economic crises. Moreover, R&D significantly affects regional competitiveness. Innovative and R&D-intensive regions lure more investors. As a result, several programs aimed at boosting the development of R&D are implemented. For this reason, government is increasingly supporting firms and consumers to match the demands and opportunities of the changing economy. In a growing number of countries, the policy makers want public sector research to strictly cooperate with industry (not only MNCs), in order to increase the effectiveness of the funding.

BOX 3: The Disruptive Innovation model by Clayton Christensen

The Disruptive Innovation model presented by Clayton Christensen perfectly fits into this chapter about small and medium enterprises, especially when talking about high innovative small businesses. The idea generated by the combination of both the innovator's dilemma and the innovator's solution, sets the rules that a small entrant into the market should follow in order to compete and win against a big incumbent with more resources.

To understand the model, the first step is defining the costumers present in a given market for a product or service. After a rough segmentation they are divided in three categories: (1) non-consumers, (2) mainstream customers and (3) high-end customers. The big company operating in this market (incumbent); starts by producing a product/service appealing to the mainstream segment. Then before reaching saturation the incumbent innovates in order to reach the more demanding and higher profitable high-end consumers.

Following this profit maximization approach, the company continues to innovate creating what is called sustaining innovation. By doing this the firm produces products or services with more value and performance than what the mainstream customers is actually demanding. The idea behind this method is quite simple: by satisfying the most demanding customers of the market, mainstream consumers will be satisfied as well. In reality the results could be different.

The mainstream segment starts getting confused about products or services that they do not really need or use and simultaneously the lower end customers are exposed to the disruptive entrant who can enter in two ways. First: by targeting the non-consumer segment with a simple and less expensive product, which is called also new market disruption. And second by innovating on the business or manufacturing process in order to be able to reduce costs and provide a product that mainstream consumers can have at a lower price. In this situation the entrant and the incumbent are competing in the same market, but the price equilibrium is set at the marginal cost of the incumbent, which means higher marginal revenues for the entrant. Under these conditions the established company becomes unable to compete and the only solution is to abandon the segment and refocus the business in the higher margin tier. With the incumbent pushed out of the market the price will fall at the marginal cost of the entrant.

The entrant now has to figure out how to apply new innovation in its business, manufacturing, or product in order to move up into the higher profitable market (segment 3). Once this occurs the path already explained will repeat itself until the initial incumbent is forced to abandon the market. At this point is where it becomes curious: because by pushing the incumbent out of the market, the entrant becomes the new incumbent and is now exposed to a possible disruptive entrant.

Here basically ends the innovator's dilemma on whether a company should continue to innovate itself over time, and become the innovator's solution. How can the incumbent firm compete without facing the risk of a small disruptive entrant? Clayton Christensen suggests that the company should develop an autonomous business unit to compete at the lower end of the market. Even if this could be a good solution, another very impressive approach could be the one adopted by Toyota. The multinational car manufacturer keeps itself positioned in the mainstream market while establishing Lexus in order to compete on the higher end segment. Furthermore when a disruption redefines the market by turning non consumers into customers, it forces the incumbent to be reactive. This is the reason why Toyota had to establish Scion for competing with disruptors like Kia, Hyundai and Chevrolet.

3.1.2 SMEs ON THE INTERNATIONAL WAVE

Previous literature showed that globalisation places innovative small firms in small markets under increasing pressure to seek global alliances to remain competitive. Innovative SMEs, willing to improve their market share, their competitiveness, and generate new returns to invest in ongoing R&D, need to be able to spread their R&D costs and risks, and establish a pool of skills and expertise in different countries. Moreover, firms need to be able to supply integrated product ranges to the international market. These pressures are especially strong where rising standards, controls and licensing requirements for products are increasing the time and cost of R&D and of its commercialisation.

International Sources and Approaches to SMEs

Key factors for SMEs success have been increasingly receiving attention from scholars, since SMEs represent an important part of modern economies in various terms (employment, export, etc.). The increasing globalization, which modern economy is facing, exposes SMEs to the need to reconsider their strategic actions from an internationalization perspective since each of them can be affected positively or negatively by the access of news foreign agents within their market. The internationalization process of SMEs combines the firm's choices to grow through horizontal diversification, vertical integration or market opportunities exploration.

The internationalization of SMEs, generally, starts with imports, while they start exporting mostly by responding to infrequent order by foreign agents. If they observe a positive impact, they are likely to institutionalize the internationalization process by dedicating more resources to develop new foreign markets. Sales internationalization enables them to reduce the dependency on the domestic market and to exploit profitable new opportunities. It must be highlighted also that, the international growth of SMEs is still seen as affected by different internal and external factors and, in particular, by country specific competitive, culture, political, and institutional hindrances.

OECD investigation (2009) shows several limitations faced by SMEs. First of all, limited firm resources and international contacts as well as lack of high-managerial knowledge about internationalization still represent critical constraints to the SME internationalization process. It identified the sharp predominance of resource limitations as well, particularly of a financial kind, among smaller, newly internationalising firms and the vulnerability of some particular SMEs sectors to their sector specific internationalization hindrances. These barriers are substantially endogenous since they reflect the limitations of the investigated firms relating to the key resources and capabilities aimed at internationalising. Put together, the late findings on top barriers tend to be widely consistent with the conclusions of the OECD-APEC study (2007), except for a considerable diversity: no recent relevant evidence was uncovered relating to the effect of identifying foreign business opportunities.

The existence of barriers challenges policy makers to intensify efforts at removing them, especially related financial resources, international contacts, and relevant managerial knowledge (OECD-APEC, 2007). SMEs need specific support from the public sector for modelling the process of new product development frameworks. Attention should be given also to the organised private sector-led model of SME internationalization support provision. Overall, policy makers assess whether they have the appropriate support measures to address the specific set of hindrances identified and if the target SMEs are sufficiently aware of them. This very last point about information awareness is especially relevant in the SMEs sector, where policy makers are encountering higher difficulties in reaching all the potential interested parties. With MNCs it is easier, since they are easy to identify and have accessible contacts. SMEs on the other hand, are generally located all over the country which makes it difficult to ensure they are aware of every policy relevant to their sector (Valentina Fioroni interview, 2014).

International collaboration linked to knowledge (OECD STI Scoreboard 2013)

International collaboration on innovation can be defined as the active cross-border participation on it. The classification of firms (SMEs) on this topic, reported by OECD (2013), follows the Oslo Manual guidelines and is registered according to the employee's number.

Collaboration with foreign partners can play an important role in the innovation process by enabling firms to access more resources and knowledge by lowering costs and sharing risks. It can be characterized by different forms and levels of interaction. Innovation collaboration diverges by country. Brazil, for instance, focuses its collaboration on national partners, but there are several countries balancing between national and international collaboration. Firms' size affects significantly foreign collaborations: large firms appear to have higher propensity to collaborate internationally compared to SMEs, regardless of the overall rate of international collaboration.

SME Internationalization Drivers

OECD investigation (2009) states the main drivers for SMEs internationalization, focusing on the importance of growth and knowledge-related intents. Growth key factors seem to be increasingly relevant to SMEs, reflecting their rising appreciation of internationalization patterns. These firms' stock of knowledge is also observed when endeavouring to understand whether they result respectively pushing or pulling SMEs into international markets, and reinforcing their social status.

Growth opportunities regarding international markets were recently identified as a key driver of firm internationalization. For instance, the opportunity of growing and increasing profits (in other markets) from internationalization represents a key stimulus for exporting among the Australian, British, Spanish, Swedish, and US firms (Orser et al., 2008). Moreover, the decision to enter foreign markets seems to be motivated by a need for business growth, profits, increased market size, stronger market position, and weaker dependence on a smaller number of markets.

Focusing on **knowledge motivations**, there is empirical evidence suggesting that knowledge assets both push and pull SMEs into international markets. The "push" side depends on managers' previous international experience and other capacity factors, especially among Canadian, Spanish, and Swedish firms (OECD, 2009). There are also related findings on the internationalization focusing on knowledge aspects, including R&D investment and innovation capabilities. Knowledge assets may also pull SMEs into international markets to obtain missing know-how required for technological development (Kocker and Buhl, 2007).

Another potential driver investigated by OECD (2009) is given by "***network (social) ties and supply chain links***". These stimulate SME first internationalization step and process extension, especially regarding Australian, Canadian and US exports. In addition to that, taking advantage of collaborative links results a common reason among the firms investigated in the OECD countries (Kocker and Buhl, 2007).

Limits to SME internationalization

SMEs' internationalization patterns depend on several internal and external features (Annushkina, 2012). Specifically, international development is yet hindered by different

competitive, cultural, institutional, and political factors. Thus the internationalization strategies vary by country, especially according to the market of origin.

TABLE 3.1: External barriers (Annushkina, 2012)

Trade barriers
Government regulations
Supply and demand conditions
Cultural differences

Cultural factors include general distrust towards growth opportunities in different markets, unwillingness to rely on external agent or resources for managerial and financial issues, and general mistrust towards potential foreign partnerships. Culture differences also depend on language, religion, values, and local traditions, and may even compromise the foreign market's likelihood to trade. However, economic, administrative, and geographic differences are relevant too (Ghemawat, 2007). These include regulatory framework, foreign investment policies, natural barriers and the economic development stage. In fact, the relevance of these limits can be explained by the "*Transaction Cost Theory"* (Coase, 1937). Foreignness liability (unfamiliarity) raises the transaction costs for internationalizing SMEs.

Among the most important constraints, OECD (2009) identified the **top 10 hindrances**:

1. *Shortage of working capital to finance exports*
2. *Identifying foreign business opportunities (info barrier)*
3. *Limited information to locate/analyse markets (info barrier)*
4. *Inability to contact potential overseas customers (info barrier)*
5. *Obtaining reliable foreign representation*
6. *Lack of managerial time to deal with internationalization*
7. *Inadequate quantity of and/or untrained personnel for internationalization*
8. *Difficulty in matching competitors' prices*
9. *Lack of home government assistance/incentives*
10. *Excessive transportation/insurance costs*

3.2 HINDRANCES TO SMEs DEVELOPMENT

SME development involves multiple stakeholders and necessitates support by public and private sectors. It relies on market institutions as well as on the capacity of building appropriate institutional structures.

Although competitiveness is a firm level phenomenon, both macroeconomic and microeconomic environments influence market signals. Accordingly, SME competitiveness enhancement requires the creation of an enabling legal, regulatory and administrative environment, access to finance and capable institutional structures, and most important human capital and a sustainable environment. Public and private sectors must work together to improve home market efficiency, while intensifying efforts to integrate into the world economy.

There are a number of barriers that may hinder entrepreneurship and the creation and rapid growth of innovative SMEs, and hence impede the ability of economies to achieve full employment and economic growth. According to the DI environment described in chapter 2, even SMEs should be empowered in the right way in order to extract the best from their innovation and internationalization processes, so that the local economy can benefit at most.

Having already mentioned internationalization issues, we focus on four main categories into which constraints to SME development can be grouped: (1) inappropriate regulatory framework, (2) poor support to innovation and entrepreneurship, (3) difficult access to the market and (4) financing problems.

Regulatory Framework

The legal and regulatory frameworks establish the rules of a society and manage the interactions between the government, enterprises and civil society. Rules affect investment decisions, the opportunities and rewards available to economic actors. Governments set them to raise tax revenues for investments in public goods, defence, protection of law, and to maintain health and safety of consumers, and of the environment. Rules compliance comes with costs of doing business (see paragraph 3.6).
A regulatory framework pro SMEs should present the following characteristics (OECD, 2004):

1. *Clearly recognized property rights;*
2. *Easy contracts enforcement;*
3. *Simple, transparent and low-compliance-cost tax system;*
4. *Businesses are able to register with authorities through a simple and inexpensive system, preferably by remote access through the Internet;*
5. *Business licensing requirements are minimized, and when they are enforced, are aimed to protect health and safety of consumers and labour rather than being a source of revenue for local and/or central government;*
6. *Flexible labour regulations, protecting the rights of labour and the firm equally;*
7. *SMEs, whether they are exporting or importing, interact with a streamlined customs administration that is efficient, simple and transparent;*
8. *Financial sector regulations recognize SME constraints and have introduced appropriate legal and regulatory instruments that enable commonly available SME assets to be used as collateral;*
9. *Local public administrators appreciate entrepreneurs as they contribute to economic growth, treat them fairly and are committed to limiting corruption to a minimum;*
10. *Legislation and regulation is gender insensitive (rules apply equally to men and women);*
11. *SMEs can easily set up and join membership organizations;*
12. *Bankruptcy legislation does not impose unduly high penalties on the entrepreneur or the SME.*

Relevant conclusions have arisen also from the Cambodia workshop (2003): "*Trade capacity building and private sector development in Asia".* It states four focal points for SMEs' good regulation: **proportionality**, **transparency**, **accountability**, and **consistency**. The former point asserts that regulation's impact on small firms is identified by an adequate balance between cost and risk. Then, it is important that policy objectives are clearly defined and effectively communicated (transparency). Relating to accountability, proposals have to be published and are all consulted before taking decisions. Last but not least, new regulations have to be consistent with existing regulations, and consistently applied across countries/regions (consistency).

Innovation and Entrepreneurship Promotion

Governments recognise that SME support will not be successful without a vibrant entrepreneurial sector, consisting of people who pursue opportunities and assume risks in deciding to develop new goods and services. However, we have already mentioned (1.2.1) that the entrepreneurial process is affected by different social, cultural and political factors that can limit entrepreneurial opportunities. Yet, it is the vitality of the entrepreneurial sector that drives business dynamics and stimulates overall economic growth. Recently, governments have targeted their policies and programmes more towards fostering entrepreneurship, but measuring is complicated. Several approaches emphasise firm startups and closures as an indicator of the willingness to engage in a risk-taking activity and the ease with which resources can move quickly from one activity to another. Features discouraging entrepreneurship include education, which is risk-averse, as well as regulations and institutional impediments, which discourage the establishment of new ventures or existing activities expansion (OECD, 2000).

Access to the Market

SMEs are often unable to exploit market opportunities since they require large volumes of production, broad product range and regular supply. Market failures, in particular, bias SMEs perception limiting access to credit market and investment for technology transfer (World Bank, 2003). In addition, SMEs lack information and marketing skills, and have little access to expertise and finance. Accordingly, they are often unable to enter the global channels of production and sale. These obstacles to growth can be overcome when SMEs join forces in collective endeavours by combining knowledge, skills and resources, in order to improve their export potential and reduce costs and risks involved in penetrating new markets (UNIDO, 2007). In particular, they need to minimize transaction costs and to mitigate, while keeping key assets and skills under control, as already mentioned concerning internationalization issues.

***Entry-mode options in* the case of internationalization** *(Annushkina, 2012)*

The table below represents various entry-modes to international markets by combining the target foreign market attractiveness and the replicability of the business model on each new foreign market. SMEs can benefit from market opportunities with a relatively low investment in the presence of both high replicability of the business model and foreign market attractiveness (sale representative offices, franchising, licensing). In the case of a highly attractive foreign market, but low business model replicability, firms can opt for joint ventures or FDI. Conversely, associated with not very attractive foreign markets, SMEs can, respectively, decide to import, if there business model is highly replicable, or count on export and trade fairs otherwise.

Business Model Replicability			
	HIGH	• Importers or distributors • Agents • Distribution agreements	• Sales representative offices • Franchising • Licensing
	LOW	• Sales consortium • Ad hoc promotions and export • Trade fairs	• FDI • Joint ventures
		LOW	**HIGH**
		Foreign market attractiveness	

Financing Needs

SMEs identify financing as one of their most overwhelming obstacles to growth and investment. Beyond the considerations taken about access to market, it can be due to different macroeconomic and microeconomic challenges: high budget deficits and unstable exchange rates and legal, as well as an inappropriate regulatory and administrative environment. In some economies, capital may just not be available, property rights regimes may not allow ownership of land, markets for transfer of assets may be very underdeveloped, credit and regulation may not allow certain assets that SMEs commonly have access to, absence of registries for mortgages and pledges may increase risks to lenders. Moreover, contract enforcement may be vulnerable because of weaknesses present in legislation and in the judiciary.

Another potential obstacle may be due to organizational capacity weaknesses. For instance, in least developed economies, business services markets may be so underdeveloped that SMEs are not able to access or afford essential services they would need when approaching lenders. At the same time, more advanced developing countries, which are characterized by more developed institutions, SMEs may still face challenges in accessing financing. For example, although SMEs are considerably the largest group of customers of commercial banks in any economy, loans extended to them are often limited to very short periods, thereby avoiding financing of any relevant investment. In Spain for instance, there is a high presence of micro SMEs with high international potential, but in order to make them grow and become profitable the system has to bear the risk to lend them the financial resources necessary (Luis Guerra Casanova interview, 2014). Furthermore, since SMEs loans are perceived as high-risk, access to competitive interest rates may be limited. Finally, banks of many developing economies prefer to lend to governments (less risk and higher returns), ruling out most of the private sector from the financial system.

FTW Financing Mode

Finance, Transportation and Warehouse is an innovative financing mode (Qui, Daoli and Boming; 2002) whose academic emergence is creating new hope for SME financing. This process turns current assets which are not willingly accepted by banks into acceptable, and then implement credit finance with mortgaged product. Specifically, it sees SMEs (mostly from manufacturing sector) depositing its raw material purchased, or product at FTW set up by a third party logistic firms as mortgage suitable to obtain a loan from banks, and then gradually returning the funds according to the mortgaged product's sales.

To date, there are three main FTW modes, depending on different pledgers or guarantors: 1. Current assets as mortgage by SMEs; 2. Current assets as mortgage by suppliers; 3. Credit guarantee provided by third party logistic enterprises.

The first kind of FTW sees the financial institution as dominating agent since it the credit loan supplier, while the third party provides the FTW service. The second one arises from the potential fund turnover problem that is likely to emerge when SMEs purchase from suppliers. As a result, the supplier can provide mortgage (according to SME credibility) and support SMEs to obtain financing. The last mode is the one that can better help SMEs. Here, the third party logistic firm provides credit guarantee management to the financial institution, which grants some credibility degree to it. This mode is advantageous for the third party as well, since it is enabled to expand its service range, consolidate client relationship and improve loan screening.

Finally, it is crucial to highlight that not every enterprise can act as third party logistic in these modes, but only those with large scale, good credibility, good operation, and good performance.

In the following table, there are some SMEs challenges in access to finance and corresponding innovations by banking system (UNCTAD, 2001).

TABLE 3.2: SMEs Financial constraints vs Banks' Response

FINANCIAL CONSTRAINTS	BANKS' RESPONSE
SMEs are regarded by creditors and investors as high-risk borrowers because of their lack of assets and of their low capitalization vulnerability to market fluctuations and high mortality rates.	*Limiting SME asymmetrical information and high risks perceptions by using credit scoring systems, external information providers, risk self-assessment, sharing risk with third parties.*
Asymmetrical information, which arises from SMEs because of their lack of accounting records, inappropriate financial statements or business plans, complicates investors and creditors' assessment of the creditworthiness of potential SME proposals.	*Lowering lending costs by employing most recent information technologies, simplifying the process.*
	Developing products matching better with SME needs.
	Improving financial services for SMEs through bank staff training and SME customers' segmentation.
High transaction costs of investing small amounts do not make SME financing a profitable business.	*Cooperating with SMEs in order to reduce risks and costs and combine financial with non-financial services.*

Supporting SMEs Development

SME development is a crucial theme for national development frameworks, which depends on various sectors, involves several stakeholders and requires the support of both the public and private sectors. As previously stated, enhancing SME competitiveness requires the creation of an enabling regulatory framework, access to finance, capable institutional structures, human capital, and sustainable development. Public and private sectors need to work together to improve the functioning of domestic markets, while intensifying efforts to integrate into the world economy.
Understandably, each country has to find its own way to strengthen the legal, policy and institutional frameworks in which SMEs work and which set the quality of the enabling environment.
Based on the findings and analysis of existing literature (OECD, 2004), seven key components of an **SME strategy** can be identified:

1. Embed national SME development strategies in the broader national development through institutionalized processes;
2. Increase efforts to develop and strengthen enabling legal and regulatory environment at local, regional and national levels;
3. Ease availability and access to financing, particularly with long-term opportunities to improve trade and investment capacities of SMEs;
4. Improve infrastructure services delivery to facilitate the access to the market and reduce the cost of doing business;
5. Strengthen (institutional) support structures for SME development;
6. Strengthen the gender, environment and health dimensions of SME development;
7. Enhance policy coherence at regional, national and international levels and actively manage aid effectiveness.

Recently, beyond these factors, the importance of R&D-intensive sectors have been increasingly emerging.

The support to SMEs is a phenomenon that is widely seen as fundamental, in order to guarantee the successful development of a country and an increased living standard. In the last framework program of the EU, called *Horizon 2020*, there is a specific section dedicated entirely to high-innovative SMEs development with a budget of €2.8 Billion (AUD3.7 billion) spread over seven years. In light of several interviews with people engaged in policy development across different European countries, some important issues need to be highlighted. Firstly, there is a problem of ensuring sufficient financing opportunities to SMEs (and startups). The early phases of a new business development are the most critical ones. The government should support these new entrepreneurial activities, not only from an academic point of view, but also in terms of financial needs (Luis Guerra Casanova interview, 2014). Secondly, there is a need for an alignment between University and research centres R&D and top industry sectors in the country. *"Somehow we are facing a Knowledge Paradox, where we have several subjects of excellence in terms of R&D, but we are not able to transfer all that knowledge to the private sector in order to make it profitable" (Gideon van der Staaij*

interview, 2014). As previously mentioned, it is fundamental from an internationalization development perspective, that the most successful SMEs are able to bridge the gap and go international. Finally, the SME sector is most important in terms of employment, and the rate of creation of new businesses is extremely important also for a country. The education sector should adapt to the surrounding economic environment in order to address the new economic challenges. To do that, a more entrepreneurial culture needs to be taught (particularly at the university level) and students with higher potentials must be allowed the possibility to cultivate and let it emerge (Mattia Corbetta interview, 2014).

As previously discussed, each country should develop its own policies, given the fact that every situation differs from another. However, it is also true that some basic problems and issues are common in several countries that presents similar degrees of economic development. In this case, the policies created could differ significantly, but the desired results tend to be aligned across countries.

Institutional Support

There has been a gradual and global shift in the pattern of SMEs institutional support. Initial actions in the 1950s perceived the SME sector through a paternalistic view as an entity to be protected. Technological progress shifted this model since the 1980s by enhancing focus on specific sub-sectors and activities. This was done with considerably larger amounts of assistance and subsidies towards high technology oriented firms and entrepreneurship development. Globalization and trade liberalization led to a paradigm of facilitation, where a holistic approach to competitiveness takes priority. In the developing world, India was a leader in SME development, its experience well illustrates how the SMEs promotion evolved as the paradigm changed. In a large number of developing countries the paradigm shift has yet to occur or is experiencing difficulties in progressing. There may not be an SME development strategy or the government and development partners may have agreed that a private sector development strategy would suffice to address SME development issues. A review of SME development strategy could have a more holistic approach, involving measures for creating an enabling environment, public-private dialogue and business facilitation. Yet these situations keep inefficient institutional structures intact, resulting in continuous budget losses (without clear evidence to prove them). This approach is therefore not overly productive, as it does not fulfil the need to create capacity within the public sector.

Need for Policy Interventions and Implications

SME development should be mainstreamed into the national development framework by building up market institutions and appropriate institutional structures.

Theoretically, in summary, three main reasons can be identified to motivate the need of public intervention (World Bank, 2003):

1. Market failures bias SMEs perception (limited access to credit market, and underinvestment for technology transfer);
2. Small size generates cost disadvantage for SMEs (higher transaction costs);
3. SMEs are limited in capability development.

There is no single way to support and underpin SME competitiveness in a globalized economy.

In order to deal with the issues reported previously, the following table presents some suggestions by WB (2003) and OECD (2009) for creating policies with the specific aim of improving particular aspects.

TABLE 3.3: Summary of support policies for SMEs

Policies	To Improve
Address market failures to open market access	**REGULATORY FRAMEWORK**
Improve transaction efficiency and reduce risk	
Reduce fixed cost	
Protect intellectual property rights	
Raise awareness and help establish business linkages programmes	**ENTREPRENEURSHIP**
Help with innovation and technology capacity (promoting technology transfer among SMEs and between SMEs and MNCs by means of public-private partnerships connecting research centres/universities and industry)	
Support clusters as stepping stones towards SME internationalization	
Provide market support structure to help build SME competitiveness	**MARKET ACCESS**
Foster markets for services suitable for and demanded by SMEs	
Facilitate SME consortia for joint marketing (or bidding) for procurement contracts	
Reduce risks and transaction costs	**FINANCING**
Increase competitive pressure in financial markets	
Strengthen financial institutions' capacity to serve small clients	
Help with financing (factoring and reverse factoring for low-tech SMEs)	

3.2.1 EASE OF DOING BUSINESS

An expanding private sector that is characterized by new firms entering the market, creating jobs and developing innovations, contributes to a more prosperous society. Governments play a fundamental role in supporting a dynamic ecosystem for firms, by setting the rules that establish and clarify property rights, reducing the cost of resolving disputes and increasing the predictability of economic transactions. As addressed previously, entrepreneurs need a good regulatory framework in order to start and grow small and medium-size businesses, which represent the driver of growth and job creation for most economies. There are several aspects that affects the capability of entrepreneurs to start a new business, and here the purpose is to use a World recognized program in order to evaluate where all the hindrances presented before are better overcome by governments.

The "Ease of Doing Business" World Bank program is a perfect instrument for policy makers in order to understand how the environment surrounding SMEs is structured and in which area they should operate to affect it. The WB sheds light on how easy or difficult it is for a local entrepreneur to open and run a small to medium-size business when complying with relevant regulations.

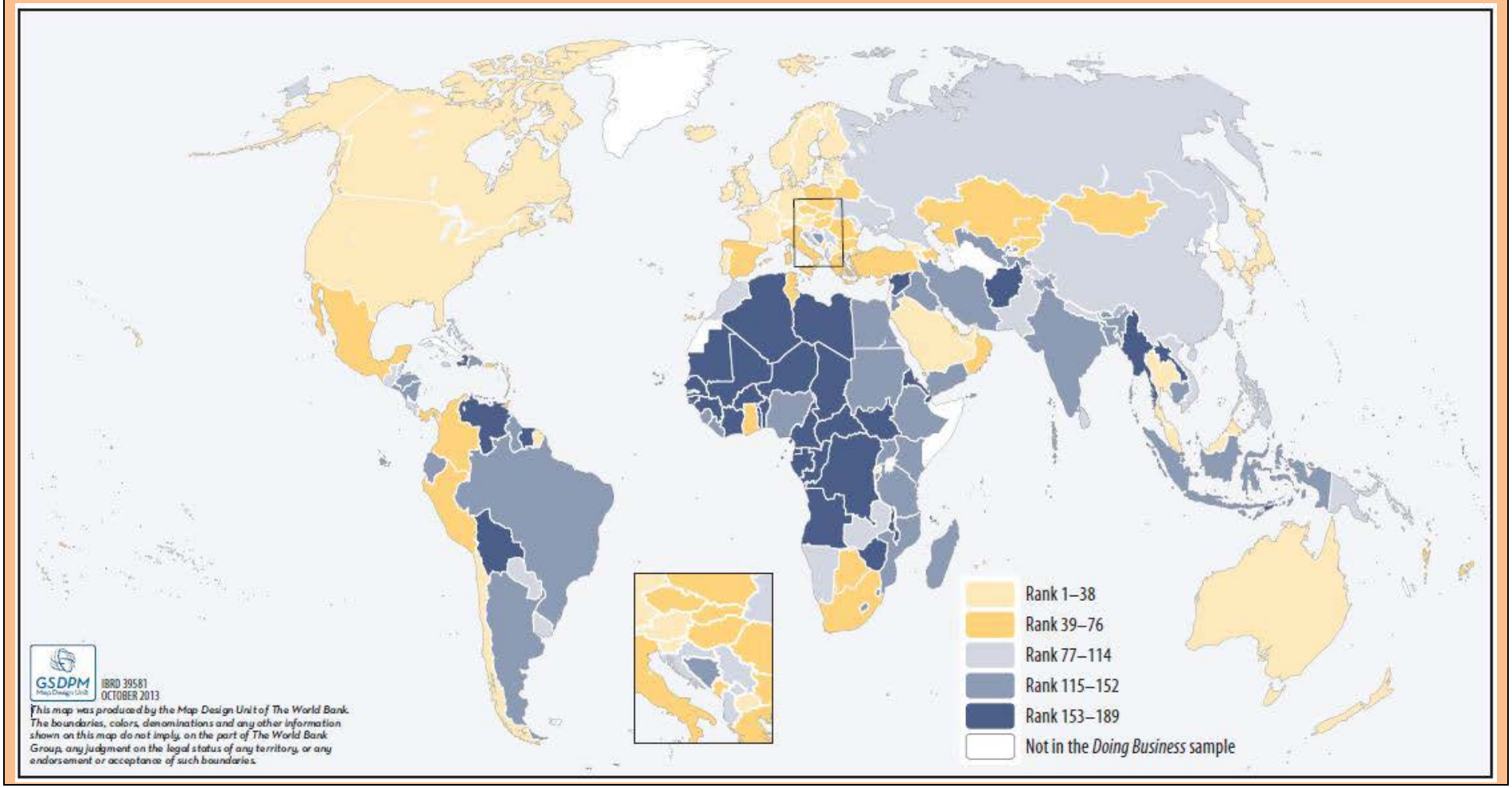
The Ease of Doing Business Program and its Indicators

The program measures changes in regulations affecting **11 areas** in the life cycle of a business:

1. Starting a business;
2. Dealing with construction permits;
3. Getting electricity;
4. Registering property;
5. Getting credit;
6. Protecting investors;
7. Paying taxes;
8. Trading across borders;
9. Enforcing contracts;
10. Resolving insolvency;
11. Employing workers.

The program presents quantitative indicators on business regulations and the protection of property rights that can be compared across 189 economies over time. However, this methodology has its limitations as it does not cover every relevant area of business. Nonetheless, it highlights the main obstacles in doing business, thus helping to identify the source of the obstacles themselves and supports policy makers in designing regulations.

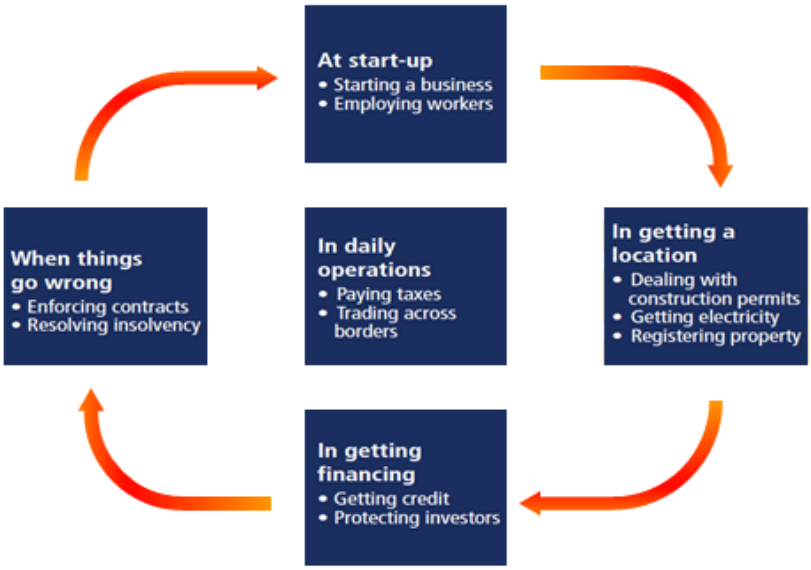
FIGURE 3.1: Where the economies stand in the global rankings (*Ease of Doing Business 2014*)



Source: *Doing Business* database, World Bank.

This project aims to deliver knowledge that will catalyse reforms and help to improve the quality of rules supporting the private sector's activities. In a global economy characterized by constant variation and evolution, it becomes essential to assess whether the rules are sensible or excessively oppressive, if they create perverse incentives or improvements, and if they safeguard transparency and encourage adequate competition. To have a tool that enables economies to progress over time and with respect to each other, the development of the building blocks for a good business environment is crucial to the creation of a prosperous world, with increased opportunities for everyone.

FIGURE 3.2: Ease of Doing Business Summary Scheme



Source: *Doing Business 2014: Understanding Regulations for Small and Medium-Size Enterprises, World Bank*.

All the points listed and explained below create a framework in which policy makers can evaluate their performance in terms of ease of doing business. The base of their actions where considered necessary, could be taken for their citizens wanting to become entrepreneurs.

Starting a business

Formal registration of companies brings many advantages at once for both companies, business owners and employees. Legal entities can live longer than their founders. Resources are pooled as several shareholders join them to start a business. Formally registered companies have access to services and institutions from courts to banks as well as to new markets. Their employees can benefit from legal protection and in addition, it results in limited liabilities for company owners. Where governments make registration easy, more entrepreneurs start businesses in the formal sector, creating more jobs and generating more revenue for the government.

Economies all over the world have taken steps in making it easier to start a business. This has been done through setting up a one-stop shop, making procedures simpler or faster by introducing technology and reducing minimum capital requirements. Most of them have

undertaken business registration reforms in stages. Among the benefits have been greater firm satisfaction and savings and more registered businesses, financial resources and job opportunities.

Dealing with construction permits

Construction permits represent an essential tool to protect the public, but it needs to be efficient, to avoid excessive constraints on a sector that plays a significant role in every economy. Where complying with building regulations is excessively costly and takes too much time, many builders would rather leave. They may pay bribes to pass inspections or simply build illegally, leading to dangerous constructions that put public safety at risk. Everyone is better off with simple, straightforward and inexpensive compliance.

Smart regulation ensures that standards are respected while making compliance easier and more accessible. Consistent and transparent rules, efficient processes and adequate allocation of resources are particularly crucial in sectors, like construction, where safety is put at risk. Governments around the world have been working on consolidating permitting requirements to ensure building safety, associated with reasonable compliance costs.

Getting electricity

Acceding to reliable and affordable electricity is vital for businesses. To counter weak electricity supply, many firms have to rely on self-supply, which is often expensive. The first step for a customer is always to gain access by obtaining a connection regardless of the electricity's availability.

Obtaining the connection is essential for the most basic operations of a business. In many economies the connection process is complicated by the multiple laws and regulations involved (service quality, general safety, technical standards, etc.). Governments are working to consolidate requirements for obtaining an electricity connection in order to ensure safety in the connection process, while keeping connection costs reasonable.

Registering Property

Pledging formal property rights is essential. Effective administration of land is part of that. If formal property transfer is overpriced or problematical, formal might go back to be informal. Property, which is informal or poorly administered, is unlikely to be accepted as collateral for loans (limiting access to finance).

Worldwide economies have been easing for entrepreneurs to register and transfer property (computerizing land registries, time limits for procedures, low fixed fees). Many have substantially reduced the time requirements.

Getting credit

Two kinds of frameworks can ease access to credit and improve its allocation: credit information systems and borrowers and lenders in collateral and bankruptcy laws. Credit information systems enable lenders' rights to view a potential borrower's financial history (valuable information when considering risk), and permit borrowers to establish a good credit history that will facilitate access to credit. Sound collateral laws allow businesses using their assets as security to generate capital, while strong creditors' rights have been associated with higher ratios of private sector credit to GDP.

Governments can increase entrepreneurs' access to credit toughening the legal rights of lenders and borrowers under collateral and bankruptcy laws, and increasing the scope, coverage and accessibility of credit information.

Protecting investors

The ability of companies to raise the capital they need in order to grow, innovate, and compete, is affected by the degree investors' protection. If the laws do not protect minority shareholders, investors may be not inclined to provide funding to companies through the purchase of shares unless they become the controlling shareholders. Effective regulations define related-party transactions precisely, promote clear and efficient disclosure requirements, require shareholder participation in major decisions of the company and set detailed standards of accountability for company insiders.

Economies with the strongest protections of minority investors from self-dealing require disclosure and define clear duties for directors. They also have well-functioning courts and updating procedural rules that give minority shareholders the means to prove their case and obtain a judgment within a reasonable time. Accordingly, reforms to strengthen investor protections may move ahead on different aspects (new company laws, securities regulations or civil procedure rules).

Paying taxes

Taxes are fundamental since they fund the public facilities, infrastructure and services that are crucial for a well-functioning economy. However, tax rates level needs to be prudently chosen, avoiding complex rules. According to the "Doing Business" report, in economies where taxes are more difficult and costly to pay, larger shares of economic activity result in the informal sector (where businesses do not pay taxes at all).

Worldwide economies have been making tax payments faster and easier by consolidating operations, reducing the payments frequency or offering electronic operations and payment. Many have lowered tax rates and achieved results. Some other economies have seen tax revenue even rise by simplifying tax payments and reducing rates, as a consequence of the reduction of tax evasion.

Trading across borders

Today's ease of trading, increasingly influenced by globalization, is vital for business. Excessive document requirements, burdensome customs procedures, inefficient port operations and inadequate infrastructure all lead to extra costs and delays for exporters and importers, stifling trade potential. Research shows that exporters in developing countries gain more from a 10% drop in their trading costs than from a similar reduction in the tariffs applied to their products in global markets.

As reported by "Doing Business" data, ease of trading across borders, is increasing over the years around the world. Governments have introduced tools to make trade easier (risk-based inspections, electronic data interchange systems). These changes help trading environment and firms' international competitiveness to develop.

Enforcing contracts

Effective commercial dispute resolution brings many benefits provided that courts are essential for entrepreneurs in interpreting the rules of the market and protecting economic

rights. Efficient and transparent courts encourage new business relationships because businesses know they can rely on the courts if a new customer fails to pay. Fast trials are essential for **small enterprises**, which may lack the resources to stay in business while awaiting the outcome of a long court dispute.

Economies, in the entire world, have been improving contract enforcement in the later years. A judiciary can be improved in different ways. One way, higher-income economies tend to enhance its efficiency by introducing new technology; another way is to reduce backlogs by introducing periodic reviews to clear inactive cases from the docket and by streamlining procedures.

Resolving insolvency

A robust bankruptcy system is essential as a filter to ensure the survival of efficient companies and reallocate the resources of inefficient ones. Fast and cheap insolvency proceedings result in the speedy return of businesses to normal operation and increase returns to creditors. By improving the expectations of creditors and debtors about the outcome of insolvency proceedings, well-functioning insolvency systems can ease access to financings, and improve growth and sustainability in the overall economy by saving more viable businesses.

A well-balanced bankruptcy system distinguishes companies that are financially distressed but economically viable from inefficient companies that should be liquidated. Yet in some insolvency systems even viable businesses are liquidated. This is about to change. Many recent reforms of bankruptcy laws have been aimed to help more of the viable businesses survive.

Employing workers

The “Doing Business” report measures flexibility in the regulation of employment, with the specific regard of the influence on hiring and redundancy of workers and the rigidity of working hours. Between 2007 and 2011, there were improvements aimed at aligning the methodology for the employing workers indicators according the International Labour Organization (ILO) standards. Only 4 of the (188) ILO conventions cover areas measured by “Doing Business”: employee termination, weekend work, holiday with pay and night work. The “Doing Business” methods are fully consistent with these 4 standards.

Employees need laws for protection against arbitrary or unfair treatment and to ensure efficient contracts with employers. Most past labour regulations’ changes resulted in an increased labour market flexibility.

3.3 THE ROLE OF SMEs IN THE GLOBAL BUSINESS ENVIRONMENT

3.3.1 AUSTRALIA

SMEs have been thoroughly investigated by Meng and Cerini (2014) as they play an essential role in the Australian economy. As reported in a study in 2005 (Australian Government), Australian SMEs (particularly innovative ones) generally seek to take their innovation to the global market through different mechanisms and channels. Offshore sale or establishment of a holding company, leading to R&D further expansion are some examples of mechanisms used. In doing so, they meet several challenges, which could be simplified through an appropriate regulatory framework. In this context, the role of the *Ease of Doing Business* program is increasingly pivotal. Using the framework proposed by the World Bank and described in paragraph 3.2.1, the profile of Australia is presented below. For further information about ease of doing business in other countries, these are available in *Doing Business 2014: Understanding Regulations for Small and Medium-Size Enterprises*, by the WB.

TABLE 3.4: Australia's Ease of Doing Business Profile (2014)

ECONOMY OVERVIEW

		DOING BUSINESS 2014 RANK	DOING BUSINESS 2013 RANK***	CHANGE IN RANK
REGION	OECD high income			
INCOME CATEGORY	High income	11	10	↓ -1
POPULATION	22,683,600			
GNI PER CAPITA (US$)	59,570	DOING BUSINESS 2014 DTF** (% POINTS)	DOING BUSINESS 2013 DTF** (% POINTS)	CHANGE IN DTF** (% POINTS)
CITY COVERED	Sydney	80.74	80.67	↑ 0.07

Source: *Ease of Doing Business Report 2014*.

High level of disclosure, good regulatory framework, and political stability are the main factors for doing business in Australia positively, providing investors with confidence and security.

Australia is one of the easiest countries in the world to do business, as demonstrated by its 11th position in the Ease of Doing Business Report, and 5th when compared to economies with a large population. Australia is also among the top five economies in the World for easy access to credit (3rd) and starting a business (4th).

Single Topics

According to the Doing Business Report 2014, starting a business in Australia requires 3 procedures, takes 2.5 days, costs 0.7% of income per capita and requires paid-in minimum capital of 0.0% of income per capita. Dealing with construction permits requires 11 procedures, takes 112.0 days and costs 13.3% of income per capita. Australia is ranked 10th on the ease of dealing with construction permits. While getting electricity requires 5 procedures, takes 75 days and costs 8.7% of income per capita and global position of Australia this area of doing business is 34th. In registering property where it is 40th, Australia requires 5 procedures, takes 4.5 days and costs 5.0% of the property value.

The Australian economy has a score of 5 on the depth of credit information index and 10 on the strength of legal rights index (higher scores indicate more credit information and stronger legal rights for borrowers and lenders). The most recent 'Doing Business' data reflects how well the credit information system and collateral and bankruptcy laws in Australia support lending and borrowing today. Over time, the data is also able to help show where institutions and regulations have been strengthened (and where they have not). That can help identify where the potential for improvement is greatest. Furthermore, data reflects how well regulations in Australia protect minority investors today, and if the protection has been strengthened.

On average, firms make 11 tax payments a year, spend 105 hours a year filing, preparing and paying taxes and pay total taxes amounting to 47.0% of profit. Globally, Australia is ranked 44th on the ease of paying taxes. According to the data (46th on the ease of trading across borders), exporting a standard container of goods requires 5 documents, takes 9 days and costs $1150. Importing the same container of goods requires seven documents, takes eight days and costs $1,170. With regards to the efficiency of the judicial system in resolving a commercial dispute, data shows that contract enforcement takes 395 days, costs 21.8% of the value of the claim and requires 28 procedures. Australia currently stands at 14th in the ranking of 189 economies on the ease of enforcing contracts.

Speed, low costs and continuation of viable businesses characterize the top-performing economies. Australia resolving insolvency proceedings take 1.0 years on average and cost 8% of the debtor's estate, with the most likely outcome being that the company will be sold as going concern[10]. The average recovery rate is 81.3 cents on the dollar. Globally, Australia is ranked 18th on the ease of resolving insolvency. One of the employing workers indicators is the difficulty of hiring index. This measure assesses, among other things, the minimum wage for a 19-year-old worker in his or her first job. Data show the trend in the minimum wage has steadily declined in 2014 after a sharp increase in 2013.

Policy makers should be aware of where their economy stands in the aggregate ranking on the Ease of Doing Business, how it ranks relative to similar economies and relative to the regional average.

Backward induction toward business reforms in Australia

2008: Australia made starting a business cheaper by slashing the registration fee for new businesses (**starting a business**).
2010: Australia made obtaining a construction permit quicker by streamlining procedures (**dealing with construction permits**).

[10] The declaration of going concern means that the entity has neither the intention nor the need to liquidate or curtail materially the scale of its operations. Specifically, a going concern is a business that functions without the threat of liquidation for the foreseeable future, usually regarded as at least within 12 months. It implies for the business the basic declaration of intention to keep running its activities at least for the next year, which is a basic assumption to prepare financial statements considering the conceptual framework of the IFRS.

2011: Australia introduced the severance payment obligation and re-employment consideration, which is applicable in cases of redundancy dismissals. Annual leave was increased and averaging of hours has now been allowed for shorter periods of time. In addition, notice period where applicable in case of redundancy dismissals, were decreased (**employing workers**).
2012: Australia clarified the priority of claims scale of unsecured creditors over all shareholders' claims and introduced further regulation of the profession of insolvency practitioners (**resolve insolvency**).
2013: Australia strengthened its secured transactions system by adopting a new national legal regime governing the enforceability of security interests in personal property and implementing a unified collateral registry (**getting credit**).
2014: Australia improved its credit information system through the Privacy Amendment (Enhancing Privacy Protection) Act 2012, which permits credit bureaus to collect account payment history with improved privacy protection (**getting credit**).

3.3.2 EMERGING MARKETS

Brazil

The SME sector is reported to affect negatively regional growth while SMEs human capital effect on growth results slightly positive (Cravoy, Gourlay and Beckery; 2009). This does not imply that encouraging SMEs in Brazil is unworthy, rather it could be interpreted as a sign that some features do not attract the right type of SMEs. For instance, institutional failures may encourage rent seekers, leading to lower growth. For the same reason, Brazil could strengthen the effect of SMEs human capital by improving institutions. The SME sector size should not be increased directly in order to promote growth but instead, focus on institutional improvement, educational policies and providing more human capital formation, to make the sector more productive.

Russia

An essential role in the modernization and integration (to the Global economy) process of Russia is supposed to be played by the innovative and export oriented SMEs (RECEP 2005). These are seen as the natural renewable reserves for increasing the volume of the exported high-tech and innovative products with high added value from Russia to international markets (Russian agency for support of small and medium business, 2012). However, financing issues represent the major hindrance to Russian SME development.
Russian law provides definitions of two categories of enterprises according to the dimension of their activities: the small enterprises and the large and medium enterprises.
The imprecision of the definition of small-size enterprises and the absence of definition of medium-size enterprises make international comparisons very difficult. Russia therefore, had to establish their own criteria to define SMEs. Consequently, even national comparisons among banks tend to show hazardous results.

India

In a developing country like India, characterized by abundant labour but low capital, the SMEs represent a major source of employment. For this reason, this sector has been included in the five-year plan by the government, but it is limited by financing, marketing and low-quality problems (IBEF, 2011).

Indian SMEs have recently emerged as dominant players in the market, but have had to face several problems:

1. lack of availability of adequate and timely credit,
2. high cost of credit;
3. lack of collateral requirements; limited access to equity capital;
4. problems in supply to government departments and agencies;
5. procurement of raw materials at a competitive price;
6. issues of storage, designing, packaging and product display.

Other significant issues are:

- the lack of access to global markets;
- inadequate infrastructure facilities like power, water and roads, low technology and lack of access to modern technology;
- problems of skilled labour for manufacturing, services and marketing;
- multiplicity of labour laws and complicated procedures;
- absence of a suitable mechanism which enables the quick revival of sick enterprises and measures to close down the unviable entities;
- issues relating to direct and indirect taxation and their procedures.

Lately, they have achieved steady growth, and their contribution to the industrial sector has been improving as stimulus to future growth. However, the institutional support to the whole SME sector in order to address all the problematic issues listed above, has been inadequate thus far.

China

Meng and Cerini (August 2014) have reported the importance of SMEs of Chinese business. 98% of Chinese enterprises are SMEs and contribute to over 60% of GDP. Since 2005, SMEs have gained the Chinese government's attention, leading to a number of policies to support them. In particular, China's economy is recently experiencing a rapid growth further boosted by the crucial role played by SMEs. Since the latest reforms and opening-up policies, SMEs have been steadily developing and adapting to the emerging business landscape. Now, they are vital for the national economy, not only in terms of enterprise numbers, but also concerning the job opportunities contribution, GDP and tax, and their innovative capabilities. Lately, Chinese SMEs have also started to cooperate with local universities and other research institutions.

Turkey

SMEs role is vital for the Turkish economy as it involves a large share of the total workforce. Thus, it has been significantly supported by their government for many years, especially after joining with the Customs Union (1996). The increasingly international framework has achieved striking results with the adoption of the Bologna Charter on SME Policies (2000).

However, Turkish SMEs average characteristics are quite different compared to many other OECD countries as they have even less employees, turnover, knowledge, high-skills and capital supporting them (OECD 2004).

On the other hand, international comparisons and achieving significant results is often difficult because of several problems Turkish firms have been facing for many years. This includes the unstable and unfavourable macroeconomic environment (high inflation, deep recession, etc.), poor adjustment policies, difficulties in assessing the effectiveness of the measures taken and loss of data due to undeclared activities. Turkey also has financing problems, as do many other countries. Various policy initiatives, undertaken in the 8th Five-year Development Plan (2001-2005), aimed to improve Turkish SMEs' productivity and international competitiveness. Given these objectives, the resulting highest priority is to strengthen the business environment by increasing capital, consolidating the government budget, reinforcing the financial sector, developing competition policy and tax systems and lowering and stabilizing inflation levels. Many programs and policies exist to strengthen SMEs, but they often seem to have less effective results than might be expected.

3.3.3 WHY SMEs FROM EMERGING COUNTRIES INVEST WITH FDI?

In literature, FDI is divided into four main areas distinguished by the motivation that has generated them. They are: natural resource seeking (Buckley et al.; 2007), efficiency seeking (Dunning; 1998), market seeking, and strategic asset seeking (Makino et al.; 2002). This distinction of intentions is important because different FDI intentions reflect different strategic purposes and is the final result of varying competitive pressure and growth target.

SMEs from Emerging Economies (EE) are able to solve the first three problems listed in the following table, while they find difficulties in solving the last issue. Strategic Asset Seeking (SAS) is the main objective which motivates those companies to move abroad and seek advanced technology, high-tech manufacturing capabilities, knowledge and managerial know-how. In order to overcome the lack of those factors in their own country and try to catch-up with competitors, maybe coming from overseas, companies are pushed to invest where all those factors are present. FDI is the most used practice in order to acquire strategic assets, overcome their disadvantages and boost their process of internationalization and innovation. The other three motivations for FDI are limited in their scope or they do not fundamentally change the structure of the company undertaking them. SAS intent is distinct from the other FDI intents, as it is assets-exploring by nature and aims to transform the investor's core competency and competitive position (Dunning and Lundan, 2008; Kogut and Chang, 1991; Makino et al., 2002). This fundamental distinction should help policy makers and companies to understand what firms from those EE are seeking, while engaging in international FDI practices.

TABLE 3.5: FDI Intents Comparison

FDI intents	Main objectives	Targets in host country	Managerial challenges
Natural Resource Seeking	*To secure stable, low-cost, and high quality natural resource supply.*	*Supply of natural resources:* • *as commodities*	*Overcoming institutional barriers to legitimize resource seeking activities.*

		• *as internal production inputs*	
Market Seeking	*To sustain or protect existing Markets (by circumventing trade barriers), or to exploit or promote new markets.*	*Host country market condition:* • *market size* • *market growth prospect*	*Simultaneously exploiting existing core competence and achieving local responsiveness to develop host market based capabilities.*
Efficiency Seeking	*To achieve economy of scale and scope, and risk diversification.*	*Low cost and availability of:* • *labour* • *natural resources* • *capital*	*Protecting and extending existing core competence by global integration of foreign operations.*
Strategic Asset Seeking	*To pursue long-term strategic objectives - especially that of sustaining or advancing global competitiveness.*	*Unique, intangible, and Organizationally embedded assets:* • *advanced technology* • *brand assets* • *managerial know-how*	*Transforming and upgrading core Competence by identifying, acquiring, and reverse-transferring intangible strategic assets.*

Source: Lin Cui, Klaus E. Meyer and Helen Wei Hu (2014) *What drives firms' intent to seek strategic asset by foreign direct investment? A study of emerging economy*. Journal of World Business (2014, **49**:4)

Factors affecting the decision in undertaking FDI actions

In the study "What drives firms' intent to seek strategic asset by foreign direct investment? A study of emerging economy", Lin Cui, Klaus E. Meyer and Helen Wei Hu, try to analyse under which circumstances companies from EE start engaging in these practices. There are several factors that affect the intention of a firm in undertaking FDI and they are generally related to governance, market structure, financial and managerial capabilities.

The findings of the study highlighted some interesting outcomes. Firstly, the exposure to foreign competitors in their home countries has a positive effect on FDI intentions. This means companies from EE whose own market has been bombarded by inflows of FDI from developed economies (i.e. the case of BRICs countries); will show a positive tendency towards SAS FDI intentions.

There were mixed results for what concerned the governance, where the hypothesis of higher incentives for Private Ownership (vis-a-vis Public Company) is supported. However, the hypothesis by which the presence of what is known as 'excess control' should have a positive impact towards FDI intents is not supported. This could be interpreted as a signal that FDI for Strategic Asset Seeking could be a solution implemented by SMEs as well.

The study has demonstrated that financial slack and past performance both have a positive effect on the intention of doing FDI overseas. This aspect is especially problematic if related to SMEs world. For the purpose of analysis, only SMEs that are performing well under financial and economic perspective will be willing to invest and once again, the problem of access to credit of SMEs arises. Finally, as an associated point, managerial capabilities in which export experience and FDI experience both have a positive impact on FDI tendencies. To reiterate, in the case of SMEs this could raise big problems, which are mainly related to the lack of experience of firms in FDI and export. Therefore, the next logical step for these enterprises to overcome such problems are to find both support, and an enabling environment in which they are able to operate easily while simultaneously seeking the strategic assets fundamental for their success.

3.4 THE STARTUP COMPANIES

Startups are a recent trend embedded in the innovation business environment and at the same time strongly connected through international networks. Startups could be seen as entities which perfectly represent the concept of Double 'I' environment, due to their important implications in terms of innovation and internationalization. Startups share common aspects with SMEs in relation to hindrances and support needed, but simultaneously they present many differences. While this topic is included within the SMEs chapter, it needs to be made clear that startups are entirely different entities compared to SMEs. Startups are included here mainly due to their size (startups are by definition really small) and for their innovative declination (the idea of a startup is based on innovative solutions). This report focuses on innovation and internationalization and clearly, startups play an important role in this context.

A startup is a company, a partnership or temporary organization whose aim is to search for an innovative, repeatable and scalable business model. In general, these companies, newly created, are in a phase of development and research for markets. Startup companies can differ by form and size, which explains why there is no clear definition by law for example. Generally, they are associated with the development of mobile apps or software; however startups can operate in a wide array of sectors ranging from ICT to biotechnology, from defence to entertainment.

A critical task in setting up a business is to conduct research in order to evaluate and develop ideas and opportunities in order to get a further understanding on the business concepts as well as their commercial potential. Business models for startups are generally found via a

bottom-up or top-down approach. A company may cease to be a startup through various milestones, such as becoming publicly traded in an IPO (Facebook), or ceasing to exist as an independent entity through merger (Xobni acquired and integrated by Yahoo) or still exists and operates independently even after the acquisition (Tumblr). These are the most extreme positive endings for a startup, since it must be considered that most of them will remain as they started for a long period or failed in one-two years (failure rate is sometimes estimated around 90%).

Startups are different compared to a normal small business, since they can count on several funding options, such as venture capital firms or business angel investors. Normally they do not tend to use normal debt issued by bank or other financial institutions. Investors are attracted by these new companies because of their high-reward ratio and high scalability. In fact, successful startups are typically more scalable than an established business as they can potentially grow rapidly with limited investment of capital, labour or land. The most diffused and famous image about startups is the one related to the hockey stick, where startups are able to level all the initial investment in a maximum of three years, and from there on be profitable in an exponential way. On the other hand, high potential reward means high potential risk of failure, which leads us back to the point of access to credit by financial institutions. Professional investors recognise the high risk of failure in startups and therefore will only invest in opportunities capable of generating high returns to compensate for this risk.

The startup sector worldwide is undergoing an important aspect to drive economic growth, with the low cost and ubiquity of building blocks for tech startups leading to more entrepreneurs tackling billion dollar markets than at any time in history. A **Startup Ecosystem** can be considered as a set of organizations including universities, funding organizations, support organizations (incubators, accelerators, etc.), research organizations, and large corporations. Generally, each of them focuses on a specific aspect of the ecosystem function and startups at their specific development stages.

A relevant part of the startup ecosystem is the set of startups founded by university, which stimulates brilliant students to commercialize their research results. In many countries (i.e. such as the US and Israel) a large proportion of entrepreneurs launch their first startup during or immediately after their undergraduate degree (for example, it has been estimated that 20% of all students at Caltech, Stanford and Berkeley, form startups before they graduate). Supporting a national network for student incubators constitutes a key element of a startup ecosystem. Indeed, a network of student startup incubators raises the entrepreneurial profile and stimulates the number and success rate of tech entrepreneurship among university and students.

Recalling what is already written, a startup can be considered as a company, a partnership or temporary organization targeting to search for an innovative, repeatable and scalable business model. In general, these companies can differ a lot, but the lifecycle of a startup could be defined by 6 stages. Of course what happens at each stage can be strongly influenced by the type of startup and so the actions taken by them.

1. **Discovery** is the first phase where startups are focused on the validation of their idea and to check if they are really solving a meaningful problem to some potential customers.
2. **Validation** is the stage in which startups are interested in verifying, thanks to early customers, whether their product/service is getting validated from attention.
3. **Efficiency** is the third step and here startups improve their business plans and improve their customer acquisition process in order to scale up with a reasonable amount of them.
4. **Scale** is the most fascinating stage, where startups literally take off and grow global very aggressively pushing hard also on the marketing side.
5. **Profit Maximization** is the fifth phase in which startups develop a portfolio of customers and products with which they operate most. This could be either based on one technology or a set of them.
6. **Renewal or Decline** is intended to be the phase in which the startup (no more a startup in this stage) has to be able to renew its offer in order to stay on the market. Using Clayton Christensen's theory of disruptive innovation, in order to not be *disrupted out of the market* (decline), the firm must be able to renew itself, its products and its business model.

Other startups lifecycle are presenting a stage in between discovery and validation called 'Seed' where the development of a minimum viable product which can be shown to potential customers, sponsors and VC in order to raise the first seed capital takes place. Then the stages will continue as described above, but without the renewal stage since the objective of the lifecycle is to describe how startups reach its maximum (which happens during stage 5). However, apart from different representations of the same phenomenon, there is almost common agreement about the average time, capital needed and evaluation for each stage and the financial sources (see table 3.6).

TABLE 3.6: Lifecycle of Startups

The 6 Stages	Av. Time	Av. Capital	Funding sources	Av. Evaluation
1. Discovery	3 - 5 months	$500 - $5,000	Cash	N/A
2. Seed	3 - 9 months	$10K - $50K	3F, Mentors	$10K - $100K
3. Validation	3 - 6 months	$100K - $300K	Business Angels, VC	$1m
4. Efficiency	1 - 2 years	$300K - $500K	VC	$3m
5. Scale	3 - 5 years	$1.2m - $5m	Bridge Funding	$3 - 15m
6. Profit Max.	N/A	Large round	IPO	$10 - 30m

Source: David Bozward (2014) and authors' elaboration.

Nowadays the number of successful startups is growing, even if the failure rate is estimated to be very high (business model failure or premature scaling are the two main reasons). This could be interpreted as the result of an intensification of entrepreneurial activity over

startups, leading to interesting outcomes like in Italy where statistics show 25/30 startups are established every week (Mattia Corbetta interview, 2014). The whole startups sector is becoming more and more important, since many innovations of a country/region come from them and a lot of MNCs are somehow substituting internal R&D expenditure with external acquisition of high-innovative startups.

Startups Incubators and Accelerators

A fundamental role in the startup world is played by the so called Incubators and Accelerators. Since in the last chapter there will be a description of the South Australian situation in respect to this argument, here the aim is to provide the theoretical background needed in order to understand these latest tendencies. Although most of the time the two words (incubators and accelerators) are used interchangeably, their real meaning is different.

Incubators could be defined as the environment in which startups are provided with guidance, advice and networks, where the term environment can be intended either in a physical or virtual way. The main aim of incubators is to provide guidance and advice to the startups in order to help them grow and be successful; most of the time those incubator programs have no specific timeframe. Moreover, they generally take little or no equity in your company, thus the result is great if your goal is to get some help and retain control of your business or be prepared to go into a more competitive accelerator program.
Accelerators in fact provide a well-structured program, which in a short period will help startups to grow both in terms of size and value, in order to get ready for a specific goal, usually to be financed by VC. However the difference is really evanescent sometimes, since the aim of both incubators and accelerators is to help young startups to get through the first stages of their business lives and eventually scale up. This stage is the most important one, since it defines the concept of startups as well. The capability of scaling up with the business is a fundamental prerequisite, which describes its capability to grow as clients and customers grow while increasing its level of performance or efficiency. Accelerators take typically anywhere from 3% to 8% or more of your company equity.
One way to help entrepreneurs in choosing the right program could be to check whether there is a match between the goals of the program and the goals of the business in the future months. If they prove to be aligned, then it is the suitable program for your startup. Normally programs can consist of some benefits for startups, including:

- Free office space
- Formal curriculum
- Mentor program
- Financing
- Links to strategic partners
- Marketing assistance
- Advisory boards
- Access to angel investors and venture capital
- Help with presentation skills
- Networking events

UBI Index – Benchmarking Incubation Globally

This index is considered the leader in performance analysis of business incubators around the world. Specifically, it offers detailed comparative performance information on the world's top performing university business incubators. A broad range of performance indicators are measured using a unique research framework, all against an established and trusted methodology well developed by researchers, practitioners and industry experts. The UBI Index Benchmark and Ranking Methodology offer detailed comparative performance information on the world's top performing university business incubators. It helps business incubators become more efficient and competitive through a wide-ranging benchmark where more than 300 incubators in over 60 countries participate. Its international research team, based in Stockholm, has been successfully building the most reliable Global Top 25 ranking of University Business Incubators in the world. The provided services include global benchmarking on key performance indicator, UBI Network (events, consulting, etc.), and publications. These are targeted towards different agents: business incubators (for learning goals), universities (for teaching), VCs (for investing), Government (for policy making).

CHAPTER 4

MULTINATIONAL COMPANIES

The WIR (UNCTAD, 1999) defines multinational corporations as "incorporated or unincorporated enterprises comprising parent enterprises and their foreign affiliates". The parent enterprise controls assets of other entities in host countries, while the foreign affiliates is the enterprise in which an investor, living in another country, owns a capital stake entailing a lasting interest in the management of the enterprise.

Multinational companies are large firms mainly coming from developed and developing economies, but recently from transition economies as well. They are predominant in certain industries strongly led by marketing and technology, and employ the most advanced techniques in their own respective fields. Moreover, MNCs are attracted by large and growing economies with stable political conditions, and entail relevant policy implications and structural changes from social and economic points of view because of their increasing international role. In fact, MNCs' investments are often seen as engines for growth and development of the host economy given the resulting benefits. Globalization and further economic development have led MNCs to search for new investment locations. Thus governments of host countries often create incentives aimed at attracting the investment of MNCs. The linkage between MNCs and FDI is so close that the motivation for the latter feature may be employed to distinguish between MNCs and other firms.

In addition to these background features, in order to further stress the importance of MNCs in the business environment, attention may be also given to the potential cooperation between MNCs and SMEs.
As seen in the previous chapter, SMEs presents limits in investing in R&D and need the help from other actors, like MNCs, especially in relation to the possibility of being involved in a value chain. Entering a new market, MNCs rely mostly on their intangible assets (technology and know-how) in order to successfully compete with local SMEs which, conversely, know deeply and better the host market. MNCs may have a positive effect on SME formation, innovation and growth within the host country since they might play a fundamental role in the international diffusion of technologies to foreign firms (local SMEs too), transferring their technologies to their affiliates.
The cooperation between these so different realities may generate considerable opportunities for SMEs from a competitive, economic and learning perspective. Thus these attempts to make themselves as much attractive as possible, for MNCs, by innovating, being willing to learn and eager to grow.

4.1 INNOVATION AND R&D WITHIN MNCs

The Research and Development sector involves three main activities: basic research, applied research, and experimental development (OECD, 2013). The former one is aimed at acquiring new knowledge by means of experimental or theoretical work. The second feature is mainly targeted towards specific practical objectives. The latter one consists of systematic work based on existing knowledge.

Basic research theoretically is carried out most by universities and research centres, while applied research tends to be conducted more within companies and especially MNCs. If we consider R&D expenditure as a proxy of innovative activity undertaken by an entity, then MNCs play a crucial role. Even if, the difficulties in measuring effectively the amount of resources devoted to R&D and the fact that innovation is a broader concept that transcends simple R&D investments.

Despite those limits, this paragraph will highlight the world trend on R&D expenditure in relation with MNCs in order to provide a picture of how this category of companies is investing resources for innovative purposes.

The top 2000 companies represented in the "EU R&D Scoreboard 2013" will be used as a benchmark for understanding the main trends. All the companies reported are investing at least more than €22.6 million in R&D, since the last one in the ranking is investing that amount of resources. The R&D expenditure/investment is calculated starting from companies' latest annual reports & financial accounts[13]. Companies keep increasing their investments in R&D in 2012 at a significant rate, even beyond the growth rate of revenues, since the increase in the investment is 6.2% while the net sales rose about 4.2%. A broader idea about the phenomenon can be found in the following table.

TABLE 4.1: Overall performances of the 2000 companies in the 2013 *Scoreboard*

Factor	World-2000
R&D investment, € bn	538.8
One-year change, %	6.2
CAGR[11] 3yr, %	6.4
Net Sales, € bn	16845.8
One-year change, %	4.2
CAGR 3yr, %	8.5
R&D intensity, %	3.2
Operating profits, € bn	1549.3
One-year change, %	-10.1
Profitability, %	9.2
Capex[12], € bn	1109.1
Capex / net sales, %	7.1
One-year change, %	9.6
Number of employees, million	48.471
One-year change, %	1.5

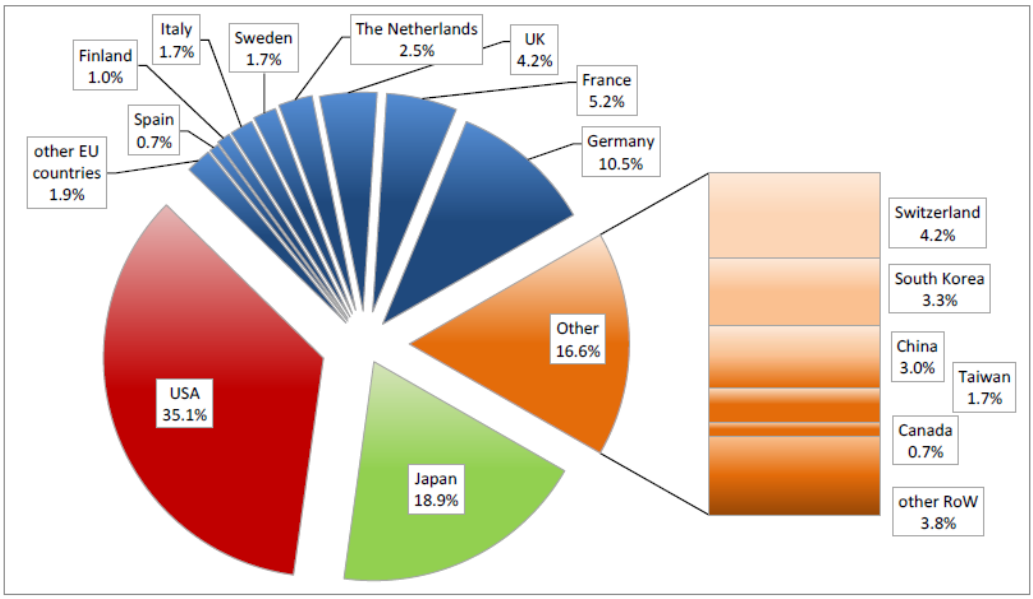
Source: The 2013 EU Industrial R&D Investment Scoreboard. European Commission, JRC/9.6DG RTD

Moving to the analysis by region, the main findings suggest that USA accounts for the most part over the 2000 companies both in terms of percentage over the total investment and in terms of the number of companies present. USA represents 35.1% of the total investment of

[11] Compound annual growth rate.
[12] Fixed capital investment.
[13] Based on audited consolidated group accounts of ultimate parent company. Companies which are subsidiaries of any other company are excluded.

€538.8bn, followed by EU with 29.4% and Japan with 18.9%. A more detailed breakdown of data is provided in the next two tables.

Figure 4.1 R&D investment by the top 2000 companies, by main world region (% of total €538.8bn)



Source: The 2013 EU Industrial R&D Investment Scoreboard
European Commission, JRC/DG RTD.

TABLE 4.2: Overall performances of the 2000 companies in the 2013 *Scoreboard*

Factor	EU	USA	Japan	Other countries
No. of companies	527	658	353	462
R&D in 2012, € bn	158.0	189.4	102.7	89.4
World R&D share, %	29.3	35.2	18.9	16.6
One-year change, %	6.3	8.2	0.4	8.8
CAGR 3yr, %	6.4	8.0	1.2	9.4
Net Sales, € bn	5974.6	3892.2	2944.0	4039.9
One-year change, %	4.3	2.9	3.3	5.8
CAGR 3yr, %	8.6	8.4	3.0	13.0
R&D intensity, %	2.6	4.9	3.5	2.2
Operating profits, € bn	483.4	505.7	131.1	429.0
One-year change, %	-18.4	-5.5	4.2	-8.9
Profitability, %	8.1	13.0	4.4	10.6
Capex, € bn	361.90	231.3	195.2	320.7
Capex intensity	7.1	6.0	6.6	8.8
One-year change, %	9.8	11.7	13.9	5.7
Number of employees, million	18.357	11.138	8.206	10.770
One-year change, %	1.1	3.0	1.3	1.0

Source*: The 2013 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG RTD*

MNC's subsidiaries are receiving increasing attention in host country innovation systems, particularly, in countries highly dominated by foreign owned companies. Interactions or links between R&D units of MNCs' subsidiaries with host country partner organisations can affect innovation dynamics in the host country. However, previous academic research suggests that the subsidiary's R&D role is crucial in this perspective. Above all, global R&D roles have been repeatedly associated with strong local links. Several factors can be identified as R&D hindrances related to the innovation system.

MNCs are increasingly seen by most policy makers as central agents in national innovation systems because of the increasing internationalization of business R&D. Accordingly, competition among countries to attract the R&D activities of MNCs has been increasing significantly in the later years. An efficient promotion of R&D-intensive FDI requires a stricter coordination between innovation policy and inward investment promotion, which are two policy areas traditionally separated (Guimon, 2013). Moreover, inward investment agencies focused on R&D-intensive FDI need to reconfigure the scope of services they provide by placing more emphasis on "after-care", since R&D-intensive FDI tends to be more evolutionary than purely greenfield (ibidem).

Specifically, FDI has a key role in international economic integration since it generates direct, stable and long-lasting links across different economies, and it is also a source of investment funding and economic growth driver, by means of the right policies.

The true challenge for policy makers is to plan a coherent and efficient strategic action encompassing the right policies by the different country's situation, but this is an extremely difficult task since it involves different government departments and agencies. In addition, the internationalization of MNCs R&D means different things to different countries. Thus there is not a unique strategy towards R&D-intensive FDI. Government strategies to attract the R&D of MNCs differ across countries depending on their size, level of technological advance, institutions, and on the existence of foreign subsidiaries in the national innovation system.

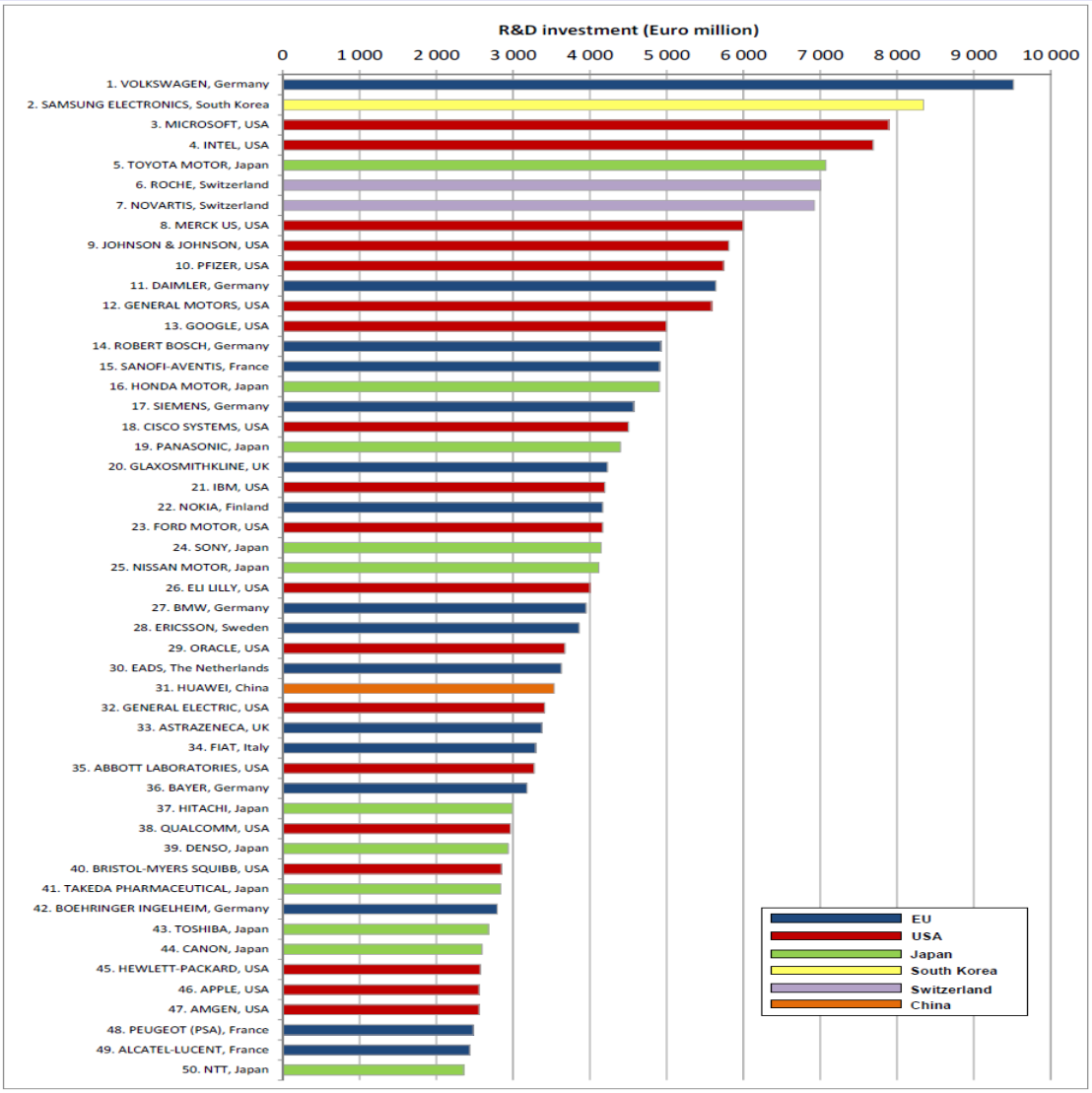
World's Top 50 R&D Investing Companies

According to data, in the 2013 *Scoreboard* there are 111 MNCs in the world investing more than €1.0bn (around A$1.38bn) each per year in R&D, and 55 companies are even surpassing quota €2.0bn. The top ten MNCs alone are investing more than €5.0bn each and constitute 13.3% of the total investment in R&D made by the 2000 companies, while it must be taken into consideration the fact that the first 100 companies represent more than 50% of the total R&D expenditure.

The leading company in terms of investment is the German car manufacturer Volkswagen (€9.5bn per year), followed by Samsung Electronics (€8.3bn) and Microsoft (€7.9bn). The German companies for the first time have also benefited from the total acquisition of Porsche AG, which boosted notably the amount of R&D reported in the data. The following

chart reports the rankings of the best 50 companies, with all the high intense R&D sectors (such as ICT, automotive, pharmaceutical, etc.) represented by their leading companies.

Figure 4.2 The world's top 50 companies by their total R&D investment (€m) in the 2013 Scoreboard.



Source: The 2013 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG RTD.

The Role of Innovation and How it Affects FDI

The interest in Foreign Direct Investment and MNCs has been increasing so much that in many countries there have been high expectations on what companies can do and generally on the FDI impact on growth and development. Indeed, FDI results are crucial due to potential and actual contribution to national economic and social development. However, the impact of FDI largely depends on the policies of the host country. It is not just a matter of liberalization since even measures of human capital and the physical and social infrastructure development can be valuable to enhance the quality of FDI that countries can attract.

Moreover, recent literature (Mugabe, 2014) has shown that MNCs tend to invest in R&D in those countries that: have a minimum domestic R&D capacity, provide legal and economic incentives for knowledge-based investments, and provide flexibility for local institutions to generate R&D partnerships with foreign companies. All those elements explain why in this report a specific and detailed section of this chapter is dedicated to the analysis of the flows of FDI.

Late technological innovation and globalization of innovation have attracted more and more MNCs as creators of innovation across national boundaries (Cantwell and Iammarino; 1998). As reported by previous literature, international IT entails various direct and indirect benefits for MNCs (Dunning, 1994), such as global technological advantages, by settling diverse network of subsidiaries (Dunning and Wymbs, 1997), and improvements in innovation capacity (Cantwell and Iammarino, 1998). FDI benefits go beyond those associated with traditional marketing strategies or manufacturing (Young et al., 1988) and include high skills development (Ó Riain, 1997) and a self-sustaining growth for the host region (Piore and Sabel, 1984). With regard to the high skills development, it has been found that a large foreign-owned ICT operation may act as a catalyst, establishing a demand for skills, which can then be met through graduate employment and the creation of complex networks, which supply training, consultancy and proprietary products and services. Such skills development may also be significantly enhanced through a diffusion of research and technological competencies (Green et al., 2001).

MNCs need to possess an ownership advantage in order to overcome the inherent difficulties of operating in different countries. Innovation yields the technological expertise that often provides the source of ownership advantage for them. Thus innovation results like a necessary precondition and an incentive for FDI.

Accordingly, more innovative firms should be characterized by more FDI but it may be deterred by the rival firms' innovation level. In some industries, the existing leaders take significant advantages of successful past innovations and therefore have a greater incentive to innovate whereas, in other industries, firms are more similar and innovation is spread across many firms. This distinction identifies a changing relationship between innovation and FDI across countries and industries.

For the newest technologies, firms generally opt for FDI over licensing on account of large transactions costs that arise because of information asymmetries. Currently, when a new technology is first created, only the innovating firm is well informed about its key characteristics. Therefore, transferring such technologies to independent firms in other countries might be rather difficult since such firms would typically not have a reliable estimate of the technology value. In this situation, the innovating firm might choose to undertake FDI by establishing a fully owned subsidiary as opposed to licensing the new technology to a foreign firm. Furthermore, internalization might also be motivated by strategic considerations: unwillingness to share the newest technologies with foreign potential competitors, worrying that a current licensee uses the technology to invent a future technology that makes it an even fiercer competitor. Both the transactions cost

perspective and strategic considerations suggest that firms will typically transfer their newest technologies through FDI and relatively more mature, and less valuable, technologies through licensing arrangements.

4.2 THE IMPACT OF FOREIGN DIRECT INVESTMENT

FDI involves the transfer of technology, financial capital and other skills (managerial, marketing, etc.), entailing costs and benefits both for home and host countries.

Empirical works concerning FDI impact are very controversial. FDI affects both home and host countries, but there are conditions and constraints to take into account in order to make positive these effects, especially for host countries.

FDI impacts on the host country can be classified into economic, political and social effects (Moosa, 2002). The economic effects entail implications for economic variables (output, balance of payments, market structure). The political issues particularly concern the national sovereignty. The social impact depends on the creation of enclaves and a foreign elite and cultural influence in the host country.

4.2.1 ECONOMIC EFFECTS

The economic impact of FDI differs either by micro or macro perspectives. Micro effects concern the structural changes in the economic and industrial organization (competitiveness). Macro analysis tends to look at FDI as a rise in foreign borrowing, focusing on the effects on trade volume, taxes, growth rate, and other relevant variables.

Economic literature, concerning economic growth and development effects, focuses on the increase in real per capita income and relates this increase to relevant variables, such as technological advance, capital accumulation, population growth and the discovery of new natural resources.
One way to assess the impact of FDI is provided by analysing the conventional multiplier process. However, this method cannot encompass the qualitative differences between domestic and FDI, which depend on different effects.

$Y = C + I + G + NX$, where *Y* is the GDP, *C* the consumption level, I the investment, *G* the government expenditure, and *NX* the net exports of an economy.

From the formula above, the following result can be derived:

$\Delta Y = \Delta I * \frac{1}{(1-\gamma)(1-\tau)+\mu}$,

Where:

- μ represents the marginal propensity to import;
- γ the marginal propensity to consume;
- τ the income tax rate.

That is, GDP variation is directly proportional to investment level variation, to the marginal propensity to consume and the income tax rate, while is inversely proportional to the marginal propensity to import and, in particular, the marginal effect of investment on GDP is equal to the multiplier.

FDI has leakages associated with domestic investment (tax, imports), but also others of its own, like the import content and remittances. Further complications may come from the association of FDI with import substitution.
FDI contributes relatively more than domestic one, since it is an important tool to transfer technology, provides higher productivity and increases the total investment in the economy more than proportionately.

FDI impacts on the host country's income and its growth considerably depends on the macroeconomic policies of that country:

- FDI is more likely to affect the host country's output if it can absorb surplus resources and improve efficiency through alternative allocations;
- if there is full employment in the host country, achieved by macroeconomic policy, then FDI inward would not influence output size since it results as efficient as any domestic form;
- if FDI can absorb surplus resources, then the output generated by net FDI remittances constitutes a net gain for the host country's output;
- if FDI can improve domestic resources' efficiency, then domestic output would rise.

As already shown by Keynes (1936), there is a direct relationship between investment and employment. FDI can directly increase employment by means of new facilities as well as indirectly by stimulating it in distribution. Moreover, it can preserve employment by acquiring and restructuring ailing firms and reduce it through divestment and production facilities closure.

Relating to the balance of payments, the impact is more relevant for developing countries (rather than for developed) since foreign exchange is considered as a scarce resource affecting growth through the foreign exchange gap. Therefore, FDI may mitigate or even worsen the constraints imposed by the balance of payments on the macroeconomic objective functions related to economic performances. In general, after that FDI occurs, the home country faces a sudden deficit, while the host country faces a small perpetual deficit as consequence of profit repatriation.

Early, Romer (1975), proposed an interesting relationship between FDI and trade volume, based on the following four steps. First, an increase occurs in the share of world manufactured exports, followed by stabilization in the trade share and rise in FDI share. Then trade share falls, as finally does FDI.
The most critical feature about this relationship is assessing whether trade and FDI are complements or substitutes. On the one hand, the first theory makes sense thinking that they are two alternative way of entering foreign markets. On the other hand, FDI is not likely to substitute trade, but rather it stimulates trade. However, there is wide consensus that

depends on whether FDI is horizontal (Markusen, 1984), or vertical (Helpman, 1984), in turn depending on various country features. Vertical FDI is likely to dominate if countries have considerably different factor endowment, while horizontal occurs when they are similar in size and relative endowments.

Last, but not least, is the crucial role played by the interaction between FDI and technology diffusion affecting economic development. In fact, technology transfers is one of the dominating issues within MNCs' discussions since technology is seen as an essential source of economic growth, trade and capital accumulation, and FDI is believed to be the major channel for the access to advanced technologies by MNCs.

Modelling FDI impact

A large number of empirical works, concerning the impact of FDI, is achieved by applying the single equation approach to time series or cross-section data. In general, models consist of an equation in which the dependent variable is the variable hypothesized to be affected FDI (explanatory variables). For instance, Borenszstein et al. (1995) studied the impact of FDI on economic growth through the equation:

$$\boldsymbol{g = f(FDI, H, Y, X)}$$

where

- *g*: is the growth rate;
- *H*: the human capital stock;
- *Y*: the initial level of output;
- *X*: is a vector composed of other explanatory variables (affecting FDI).

Alternatively, we could estimate the reverse causality linkage (Yang et al.; 2000), through an equation with FDI as independent variable:

$$\boldsymbol{FDI = f(i, E, Y, W, O, D, \pi)} \quad ,$$

where

i: is the interest rate;
E: the exchange rate;
W: the wage rate;
O : the openness to trade;
D : a measure of industrial disputes;
π: is the inflation rate.

However, this model is relatively significant since both FDI and output are quite likely to be endogenous variables affecting each other within a macroeconomic system.

BOX 4: a Literature Review over 21st Century's Empirical Investigation

The FDI role is increasingly crucial in the world economy. Thus we need theoretical and empirical investigations about the influence of FDI on inter-countries linkages. Pivotal is assessing whether it increases or decreases the trade's volume. Mundell, ahead of time, indicated a channel through which investment substitutes for trade, while later theoretical research presents cases where trade and investment may represent each others substitutes or complements. Economists try to model the basic aspects of the impact FDI on the sectoral composition of capital and labour in an economy.

Quoc Le (**2000**) compares the most relevant theoretical studies on the relationship between **trade**, FDI and **technology transfer** in order to provide a general framework focused on **growth** implications of globally integrated economies and more autarchic economies. Its main conclusion is that international trade and FDI play a key role in technology transfer and economic growth.

Technology transfer is a focal point also for Van Pottelsberghe de la Potterie and Lichtenberg (**2000**), who assess econometrically whether FDI drives it across borders. Their empirical evidence shows that a country's productivity is increased if it invests in R&D-intensive foreign countries but not if foreign R&D-intensive countries invest in it. In addition, they find the ratio of foreign-R&D benefits from outward FDI to foreign-R&D benefits from imports to be higher for large countries than for small ones.

Mayer-Fulkes and Nunnekamp (**2005**) studies results are particularly interesting as they test the impact of FDI on economic **growth** by performing **convergence regressions** derived from a model of endogenous technological change. Their analysis concludes that the true challenge of policymakers is to **improve the local conditions required to benefit from the widely perceived unique advantages of FDI**. In addition, they find evidence showing that FDI stocks do not adequately reflect FDI-related economic activities.

Some scholars also focused on the importance of **FDI outward**. Falzoni and Grasseni (**2005**) studied how investing abroad affects **productivity** and **employment** applying **quantile** regressions to Italia firms' data in order to analyse the whole distribution of firms' performance. Their results show that the extent of international production affects positively the independent variables and firms do not appear to benefit from FDI in the least developed countries (LDCs). As far as employment is concerned, FDI outward seems to negatively affect only small firms.

Daniele and Marani (**2007**) investing the determinants of FDI in the MENA* countries, focusing on the role of the quality of **institutions** as attractiveness strategy, through a **regression** analysis. They found institutions to play an important role in the relative performances of countries in attracting FDI, and suggest MENA countries deeper institutional reforms in order to improve the FDI attractiveness.

Swee-Hui Kueh et al. (**2007**) study the dynamic linkages between **FDI and trade** of ASEAN countries applying **ARDL** (AutoRegressive Distributed Lag) models. Their empirical evidence, on one hand, show that FDI and imports complement each other in the long run but imports tend to substitute FDI in the short run. On the other hand, exports tend to substitute FDI in the long run, but complement each other in the short run.

Wu and Lin (**2008**) use **threshold** regression techniques (Caner, and Hansen; **2004**) to assess whether the impact of FDI on **economic growth** depends on initial GDP, **human capital** and the volume of **trade** (threshold variables). Initial GDP and human capital result important factors affecting FDI, which is found to have a positive and significant impact on growth when host countries have better levels of initial GDP and human capital.

Bitzer and Gorg (**2008**) analyse the impact both of **inward and outward** FDI on **productivity** using industry and country level data for 17 OECD countries over the period 1973 to 2001. Controlling national and international knowledge **spill overs**, they put into question that the effects of FDI work through direct compositional effects as well as changing competition in the host country. Their findings show that, on average, productivity benefits from inward FDI. On the other hand, a country's stock of outward FDI results, on average, negatively associated with productivity. However, these effects are substantially heterogeneous across OECD countries.

* The Middle East and North Africa (MENA) is an economically diverse region including both the oil-rich economies in the Gulf and countries that are relatively resource-scarce (with respect to their population). In particular, the region includes: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, West Bank and Gaza, and Yemen. These countries strongly hinge on the price of oil and the legacy of economic policies and structures (emphasizing a leading role for the state).

Hubler and Keller (**2008**) empirically study the impact of FDI inflows on **energy intensities** of developing countries. First, they show that a simple **OLS** (Ordinary Least Squares) estimation (traditional literature) suggests energy intensity reductions from FDI inflows, consistently with the expectations of energy saving technology transfer through FDI. However, this method results spurious. Therefore, we use macro level data and apply panel estimation, which lead to the result that FDI inflows reduce energy intensities of developing countries in general. In addition, interactions of FDI with country-specific characteristics do not show significant effects, either.

Ma (**2009**) finds a positive effect of FDI on **GDP** by applying an **OLS** regression model: $GDP = \alpha\ C + \beta\ S + \gamma\ FDI + \delta\ FI + \varepsilon$, where *C* represents the consumption (public and private), *S* the savings, *FI* the total fixed asset investment.

Particularly relevant is the literature provided by Groh and Wich (**2009**) investigating why some countries are more attractive than others by means of a **composite index**, based on three key factors: **economic activity, the legal and political system, business environment, and infrastructure**.

Goodspeed, Martinez-Vazque and Zhang (**2010**) investigate the influence of three host country's **taxation, governance, and infrastructure** on the host's FDI stock, according to the different development levels of the host country. FDI results were sensitive to the host country's taxation only in developed countries, but not in developing countries, were sensitive to host country's governance and corruption in both of developed and developing host countries (more for developing countries), and were sensitivity to the host country's infrastructure quality in both of them.

Unlike traditional literature, Desbordes and Verardi (**2011**) show that there is little macroeconomic evidence about the positive impact of FDI on **productivity** growth in recipient countries, by means of an instrumental variables (**IV**) estimator since they are robust to outliers.

Omankhanlen (**2011**) analyses the impact of **exchange rate and inflation** on FDI and its linkages with economic **growth**, in Nigeria, applying **linear regression**. The study reveals that FDI follows economic growth fostered by trade openness, exchange rate affect FDI, while inflation does not.

Caporale, Pestana Barros and Damasio (**2013**) analyse FDI in 27 Asian countries, from 2003 to 2011, using a panel data **quantile** regression in order to take into account the data heterogeneity and allowing for the **GDP** growth rate endogeneity (robustness tests). Their results respect expectations according to which bigger economies are more FDI-attractive.

Iwasaki and Suganuma (**2013**) show that FDI significantly affects the **trade volume** between Russia and developed economies by applying a **panel data** to estimate gravity model of Russian trade.

Tretter and Ramirez (**2013**) look at a cross-section of ASEAN-member countries (1995-2011) and study the effect of **foreign investment policies on FDI** flows applying a **panel fixed-effects regression**. Overall results are encouraging for economic growth, in general, and growth of FDI inflows, in particular.

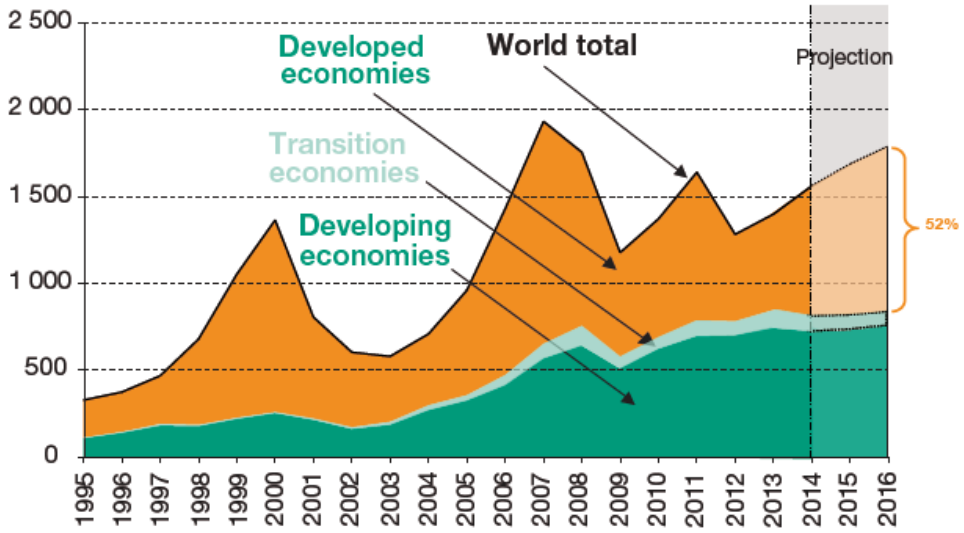
Jude and Levieuge (**2013**) assess the impact of FDI on economic **growth** conditional on the institutional quality of host countries since they see institutional heterogeneity as explanation for the mixed results of previous literature. The use of **Panel Smooth Transition Regression (PSTR**) allows identifying both the heterogeneity and the **threshold** of institutional quality affecting the relationship between FDI and growth. Their results have relevant policy implications in developing countries: institutional improvements should precede FDI attraction policies in order to benefit from FDI-led growth. In addition, they point out that some features of institutional quality have an immediate effect on fostering FDI-led growth, but others need consistent efforts.

An alternative approach, meta-regression analysis, is applied by Bruno and Cipollina (**2014**) who explain and summarize late findings from the empirical literature focusing on the FDI's effect on **firms' performances** by collecting all the relevant firm level quantitative studies to run a regression of regressions, focused on Enlarged Europe. They find a positive indirect effect of FDI on productivity and on economic growth in EU (limited in magnitude). Furthermore, the effect of FDI on growth is more relevant for new EU Members after 2001

4.2.2 GLOBAL INVESTMENT TRENDS: World Investment Report 2014

This paragraph will report the latest trends in terms of Foreign Direct Investment (FDI), relying entirely on the 'World Investment Report 2014' as source of data and information. After two periods of declining inflows FDI from developed countries, due to the two different financial crises, the total amount of them rose in 2013 reaching the level of $1,452 billion. The projections said that by 2016 developed economies will be able to reach a percentage of 52% over the global share of FDI inflows (see figure 4.3). The forecasts for attraction of FDI are positive for those economies, such as United States, Canada and Australia. This is mainly due to the fact that developed economies have been affected a way more from the economic crisis, compared to developing countries.

Figure 4.3: FDI Inflows, Global and by Group of Economies (Bln $)



Source: World Investment Report 2014, UNCTAD.

Developing countries and transition economies constitute half of the top 20 economies ranked by FDI inflows (table 4.3). Mexico moved into 10th place, mainly thanks to the acquisition of Grupo Modelo by the Belgian brewer Anheuser Busch which explains most of the FDI increase. China recorded its largest ever inflows and maintained its position as the second largest recipient in the world.

TABLE 4.3: Ranking of the top 20 host economies for FDI (2011-2013)

Pos.	2011	2012	2013
1.	United States	United States	United States
2.	China	China	China
3.	Belgium	Hong Kong, China	Russia Federation
4.	Hong Kong, China	Brazil	Hong Kong, China
5.	Brazil	Singapore	Brazil
6.	Australia	Australia	Singapore
7.	Russian Federation	Russian Federation	Canada
8.	United Kingdom	United Kingdom	Australia

9.	Singapore	Canada	Spain
10.	Canada	Ireland	Mexico
11.	France	Chile	United Kingdom
12.	India	Spain	Ireland
13.	Italy	France	Luxembourg
14.	Spain	India	India
15.	Switzerland	Indonesia	Germany
16.	Chile	Mexico	Netherlands
17.	Mexico	Norway	Chile
18.	Netherlands	Sweden	Indonesia
19.	Poland	Colombia	Colombia
20.	Luxembourg	Kazakhstan	Italy

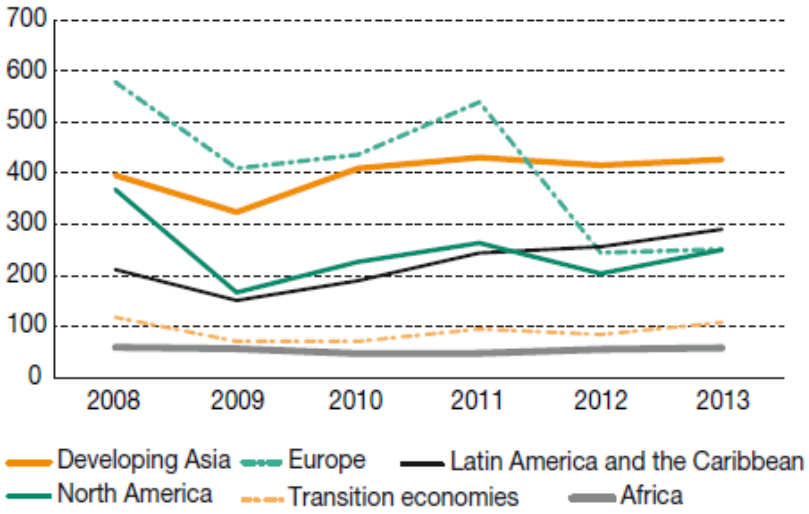
Source: elaborated on data provided by UNCTAD FDI-TNC-GVC Information System, FDI/TNC database.
Note: British Virgin Islands are excluded from the ranking because of its nature as an offshore financial centre.

Among **BRICs** countries it is notable the performance of China which reached its highest level of FDI inflows ($124 billion) and Russia which increased its inflows by almost 55% compared to the year before and moved to third position in the top 20. At the same time, Russia registered an increase also in the outflows investments of almost 94%, which is a solid signal of the potential capability of investment of Russian companies. It must be highlighted that China has slowed down its rate of growth over the last year when compared with the year before (2011/2012).

FDI INFLOWS

Developing Asia remains the world's largest recipient region of FDI flows (figure 4.4). All subregions saw their FDI flows rise except West Asia, which registered its fifth consecutive decline in FDI. The absence of large deals and the worsening of instability in many parts of the region have caused uncertainty and negatively affected investment. FDI inflows to the Association of Southeast Asian Nations (ASEAN) reached a new high of $125 billion – 7% higher than 2012.

Figure 4.4: FDI Inflows, by region, 2008-2013 (Bln $)



Source: World Investment Report 2014, UNCTAD.

North America FDI inflows raised by 23% as a result of different acquisitions by Asian investors in the region, with the largest operation carried out by Japanese telecommunications group Softbank for $21.6 billion in order to acquire Sprint Nextel, the third largest wireless network operator in the US. Also notable is the takeover of the Canadian oil and gas company, Nexen, by China National Offshore Oil Corporation[14] (*CNOOC*) for $19 billion; and the $4.8 billion acquisition of the pork producer Smithfield by Shuanghui, the largest Chinese takeover of a US company ever registered.

After remaining almost stable in 2012, at historically high levels, FDI flows to ***Latin America and the Caribbean*** registered a 14% increase to $292 billion in 2013. Excluding offshore financial centres, they increased by 6% to $182 billion.

In contrast to the preceding three years, when ***South America*** was the main driver of FDI flows to the region, 2013 brought soaring flows to Central America. The decline of inflows to South America resulted mainly from the almost 30% slump noted in Chile, the second largest recipient of FDI in South America in 2012. The decrease was due to equity divestment in the mining sector and lower reinvested earnings by foreign mining companies as a result of the decrease in commodity prices.

FDI inflows to ***Africa*** grew by 4% to $57 billion. Southern African countries, especially South Africa experienced high inflows, even if the growth is explained by intra Africa FDI inflows and outflows. Concerning ***Europe*** and especially developed economies we can observe a great recovery of Spain, Italy and Germany compared to 2012.

For our research it is important to underline the performance of the whole **APEC** region, as a potential attraction of FDI, with half of the global flows going to countries belonging to that group. It must be highlighted that seven out of the first ten host economies in the world belong to that group (US, China, Russia, Hong Kong, Singapore, Australia and Mexico).

FDI OUTFLOWS

Total FDI outflows in 2013 amounted to $1.41 trillion, up from $1.35 trillion in 2012 with a growth rate around 5%. The best investing economy is still United States and the composition of the podium did not change from the previous year, with Japan and China respectively second and third (see table 4.4).

TABLE 4.4: Ranking of the top 20 investing economies with FDI (2011-2013)

Pos.	2011	2012	2013
1.	United States	United States	United States
2.	Japan	Japan	Japan
3.	United Kingdom	China	China
4.	Belgium	Hong Kong, China	Russia Federation
5.	Hong Kong, China	Germany	Hong Kong, China
6.	Germany	Canada	Switzerland
7.	China	Russian Federation	Germany

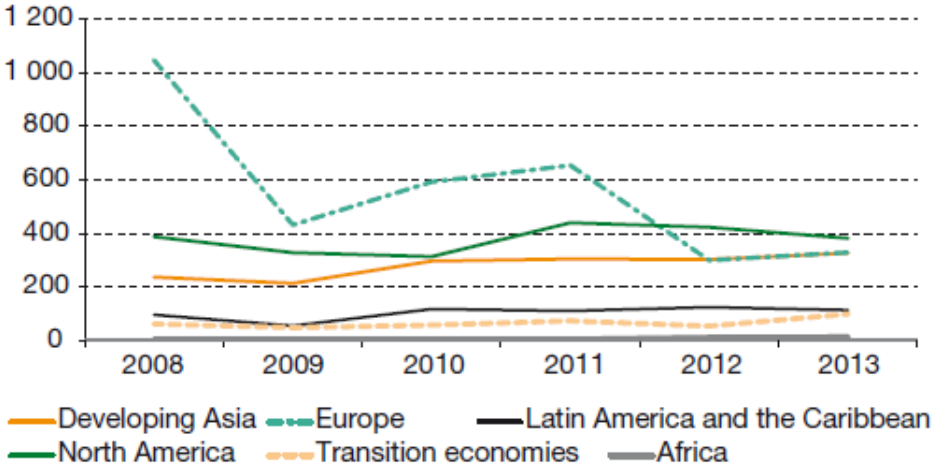
[14] CNOOC is the largest offshore oil and gas producer in China.

8.	Russian Federation	Switzerland	Canada
9.	France	France	Netherlands
10.	Italy	United Kingdom	Sweden
11.	Canada	Republic of Korea	Italy
12.	Switzerland	Sweden	Republic of Korea
13.	Spain	Mexico	Singapore
14.	Netherlands	Chile	Spain
15.	Sweden	Norway	Ireland
16.	Republic of Korea	Ireland	Luxembourg
17.	Singapore	Malaysia	United Kingdom
18.	Austria	Austria	Norway
19.	Chile	Singapore	Taiwan province, China
20.	Norway	Taiwan province, China	Austria

Source: elaborated on data provided by UNCTAD FDI-TNC-GVC Information System, FDI/TNC database.
Note: British Virgin Islands are excluded from the ranking because of its nature as an offshore financial centre.

Compared to the year before, as already mention in the introduction, the best rate of growth belongs to Russia which was very close to double the amount of outbound FDI of 2012. Other good performances in terms of growth rate can be seen in ***Europe***, where Netherlands, Spain, Luxembourg and Italy have performed very well compared to the previous year and in total EU outflows grew by 5% to $250 billion. When comparing the rankings of the best host economies, there are more countries belonging to developed economy and less from developing or transition economies group. This highlights the fact that despite the huge amount of resources going to those countries, their capabilities to invest through FDI is still limited. Moreover, figure 4.5 is providing evidence of the declining performance of European countries, which in the last five years have lost their leadership for FDI outflows. Although, in 2013 signals of recovery can be seen thanks to the already mentioned outstanding performances of Netherlands, Spain, Italy and Luxembourg to which is added the great investment effort of Switzerland.

Figure 4.5: FDI Outflows, by region, 2008-2013 (Bln $)

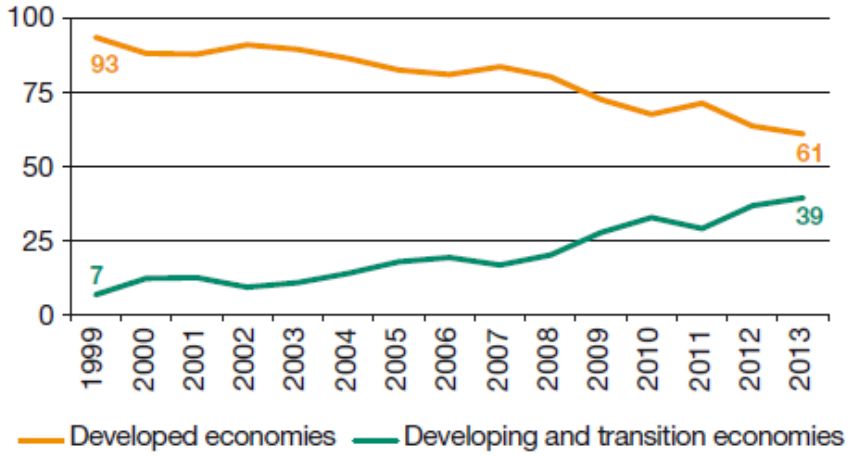


Source: World Investment Report 2014, UNCTAD.

In fact, flows from ***developing economies*** remained solid rising by 3%, and FDI from these economies reached a record level of $454 billion in 2013. However, the performance among developing regions turns out to be really heterogeneous, with countries from Asia and Africa performing really well, while those from ***Latin America and the Caribbean*** declined. It must be considered that the most important country in the Caribbean region, namely British Virgin Island, has not been included in the ranking due to its nature of offshore financial centre. ***Developing Asia*** remained a large source of FDI, accounting for more than 20% of the world's total. It displayed a rising performance of 8%, which means $326 billion of FDI, even if with diverging trends among subregions.

FDI flows from ***developed countries*** continued to stagnate with a value that is mostly unchanged from 2012 – at $857 billion – and still 55% off their peak in 2007. Investments from the largest investor (US) dropped by 8% to $338 billion, mainly led by the decline in cross-border mergers and acquisitions. Finally, as we can see from the following graph (figure 4.6) there is a tendency of convergence, over the percentage share of FDI outflows in the last fifteen years.

Figure 4.6: Share of FDI outflows by group of economies, 1999–2013 (Percent)



Source: World Investment Report 2014, UNCTAD.

FDI BY SECTOR AND INDUSTRY

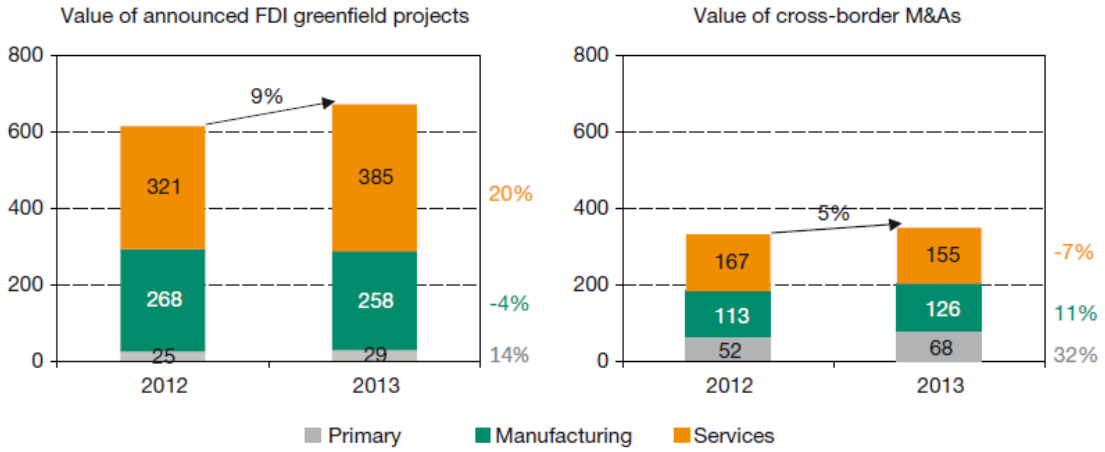
If we divide the FDI into the three main sectors: primary, manufacturing and services we can observe some interesting paths among different regions. The primary sector regained space by increasing its value of announced Greenfield projects to $29 billion and M&As to $68 billion. Developed and transition economies presented a Greenfield activity very close to zero, leaving to developing countries the biggest part of the investments in that sector (+40%).

The manufacturing sector showed a decreasing tendency over Greenfield projects around 4%, but it was offset by an increase in the value of cross-border M&As of 11%. The textile and clothing industry conversely are the most active within the sector, with a value of announced FDI Greenfield projects of $24 billion. On the other hand companies in the automotive industry are following the decreasing trend for the third year in a row. If we move to mergers and acquisitions, the activity in developed economies slowed down to 20%,

while developing countries enjoyed a fast rate of growth mainly driven by food, beverage and tobacco industries.

Services represent the only sector that is presenting a negative trend for M&As, but at the same time is performing best for Greenfield projects (+20%). The most required service in developing economies is business services, for which the value of announced greenfield projects tripled compared to 2012. Developing countries look for both capabilities and high level skills in developed countries. This gives evidence about the fact that already developed economies should value that offer in order to attract capital coming from developing and transition economies.

Figure 4.7: FDI projects, by sector, 2012–2013 (Bln $)



Source: World Investment Report 2014, UNCTAD.

BOX 5: When does FDI generate Spill Over?

The attraction of Foreign Direct Investment has always been seen as a positive signal for the hosting economy. It means that the country, for different reasons, is able to attract the interest of foreign companies to invest there due to a specific condition or factor that is not present in their home country. These investments have been widely analysed in the past, and nowadays it is quite a common opinion that they generate positive effects on the hosting economy. The so called "spill-over effects" are basically externalities of economic activity or processes which are affecting also entities not directly involved in that specific activity. The effect generated by FDI in the hosting country can be considered under the perspective of spill-over effects, which raises the question on when does FDI generate positive spill-overs for the hosting economy.

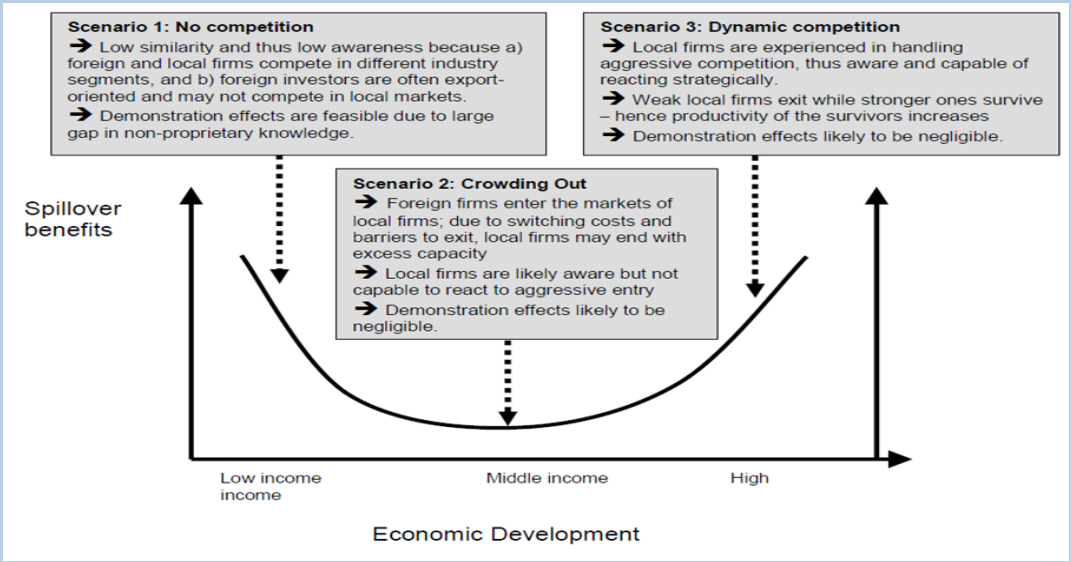
Obviously FDI going to a completely developed country, such as Australia for example, cannot be compared to FDI outflows going to developing or transition economies. The purposes leading those investments could be completely different, because of the different nature of the countries in terms of the level of development. The work of **Meyer and Sinani** (July 2008) addresses specifically this topic, with a meta-analysis suggesting some interest and important results. Starting from the awareness-motivation-capability framework of Chen (1996), the paper tries to explain the response to foreign inwards activities.

The only presence of foreign well developed companies is not sufficient to guarantee positive spill-overs, indeed the presence of the so called absorptive capacity resulted as fundamental. Absorptive capacity is the ability of a firm to absorb technology, knowledge and best practices (routines) from outside the company and specially from foreign companies in that case. This capacity can be improved thanks to investment in R&D or thanks to investment in high-skilled human capital able to capture knowledge from outside and internalize it. In broader terms, it could be said that the ability of a country to absorb positive spill-overs, thus in reality its ability to make them occur, is strictly related to the host country's level of development. This level can be evaluated as a result of different factors, which in the study mentioned above namely are: per capita income, human capital and institutional development.

The results of their hypotheses testing suggest that productivity spill-overs are related in a U-shaped form to the level of development of the hosting countries. In other words, countries with both low and high levels of income are the ones that are going to benefit most from positive spill-overs. Basically, there is the presence of three scenarios (low/medium/high income economies) in which the medium situation, despite most of the other occasions, is the most unfavourable one. In that case, foreign investors tend to enter the same product and factor markets as local firms, creating a steeling effect on the market which generates excess capacity for local firms, making them struggle in the face of FDI competition. The so called Crowding Out situation is likely to happen, where local firms are somehow aware of the presence of foreign ones, but they are not able to react to that presence and positive spill-overs will hardly take place.

In low income economies or with low level of development, the technology gap between local firms and MNCs investing through FDI is likely to be considerable. In this context, standardized knowledge brought by foreign investors is not prevented from diffusion, since is considered basic knowledge from the incoming companies and the only observation could bring significant positive effect on local firms. Those positive effects tend to disappear while moving to a higher developed economy, where the simple observation is not enough in order to generate positive spill-overs, and MNCs are starting to care about protecting the diffusion of such knowledge. Moreover, foreign investors in less developed economies tend to segment the market, by operating in different market segment or by focusing simply on the top of the pyramid and leaving the mass production of the bottom part to local firms.

The last scenario as showed in the graph below is the one in which the hosting economy presents a high level of development and local firms will in the end be engaged in dynamic competition. Foreign and local companies compete in the same market segment, so the awareness of the entrants is high and there will be a sort of engagement/interaction between them able to improve the utilization of knowledge and human capital capabilities.



The meta-analysis conducted by Meyer and Sinani (2008) have confirmed statistically the proposed differences in the three scenarios of the model. FDI spill-overs are influenced by the specific level of development of the hosting economy, with respect of three dimensions of development: income, human capital and institutions. As clearly understandable from the graph, both low and high level are likely to benefit most from FDI spill-overs. "In poor countries, demonstration effects may create spillovers with little direct interfaces, while in advanced economies spillovers result from complex competitive interactions and from local firms' strategic reaction to the entry of foreign investors in their industry. This analysis highlights that policy instruments to facilitate such spillovers may need to be quite different" (Meyer, and Sinani; 2008). Policy makers should be aware of those differences and create policy in order to avoid being stuck in the middle. In the case of Australia, the economy is already considered as fully developed and the objective of the institutions should be to control the process by which local big companies engage in dynamic competition with foreign ones. Perhaps at the same time, they should support the SME's sector in order to internalize most of the externalities created by FDI and carry them through the process of scaling up, and thus avoiding a struggle in the middle. Fostering the innovation process and the investment in high skilled human capital is a must in order to create the absorptive capacity described above, especially in SME's.

REGIONAL TRENDS

Asia continues to be the world's top FDI spot, accounting for nearly 30% of global FDI inflows. The total of $426 billion of FDI inflows is primarily due to the outstanding performance of East Asia, with China as whole (including Hong Kong province) and Japan as the two main attractors of capital. The second most important subregion is the South-East Asia, mainly thanks to Korea and Singapore (see figure 4.8a and 4.8b). When the analysis moves to FDI outflows the result does not change and, as in the previous case, West Asia and South Asia are experiencing very low levels of FDI exchange.

Figure 4.8a: FDI inflows 2007–2013 (Bln $)

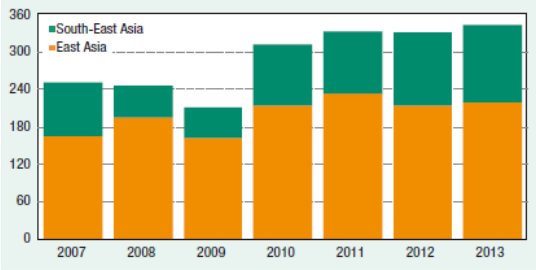
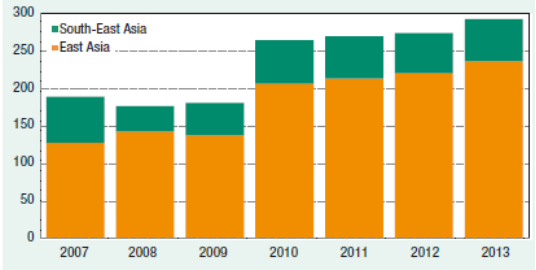


Figure 4.8b: FDI outflows 2007–2013 (Bln $)



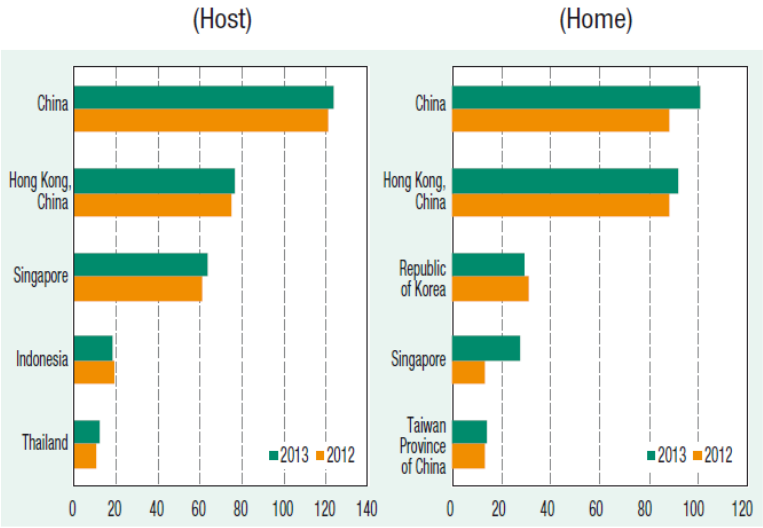
Source: World Investment Report 2014, UNCTAD.

The prospects for the future remain positive and the acceleration in the regional integration contributes to raising the level of FDI flows. As part of a renewed effort to bring about economic reform and openness, new policy measures are being introduced in trade, investment and finance thanks to the newly established China (Shanghai) Pilot Free Trade Zone. Performance of ***South-East Asian countries*** is expected to improve, especially for ASEAN low-income economies. FDI inflows to ASEAN members rose by 7% in 2013, moving from $118 billion of 2012 to $125 billion of 2013. However, there is still a huge gap between economies such as Singapore or Malaysia, and all other ASEAN countries defined as low-income economies. Countries of this group experienced very different performance, with Myanmar, for example, which increased its inflows of 17%; while Cambodia and Lao People's Democratic Republic remained almost stable over the period. Nevertheless, those countries are benefiting a lot from the investment cooperation among the major economies which allows TNCs to invest in the neighbouring countries of the most developed ones more easily. The launch of the negotiation for establishing RCEP (Regional Comprehensive Economic Partnership) gives even a more positive outlook to the whole region, and if signed the agreement will establish the largest free trade area in the world by population. It will involve the ***ASEAN*** countries, plus another six which already have separate FTA agreements with the association (Australia, China, India, Japan, Korea Republic and New Zealand).

China is growing constantly even if its growth rate for FDI inflows is slowing down; in fact in 2013 China's outflows grew faster than inflows (see figure 4.9). By attracting up to $124 billion of inflows, with a large growth attributable to cross-border M&A (from $10 billion in 2012 to $27 billion in 2013), China is narrowing its gap against the world leader for inflows (United States). At the same time, as briefly mentioned above China has strengthened its position among the best investing economies and forecasts say that within two years its

outflows are expected to surpass its inflows. Perhaps, it could be interpreted as important evidence that China should no longer be considered a developing or transition economy.

Figure 4.9: FDI flows East and South-East Asia, top 5 host and home economies, 2012–2013 (Bln $)



Source: World Investment Report 2014, UNCTAD.

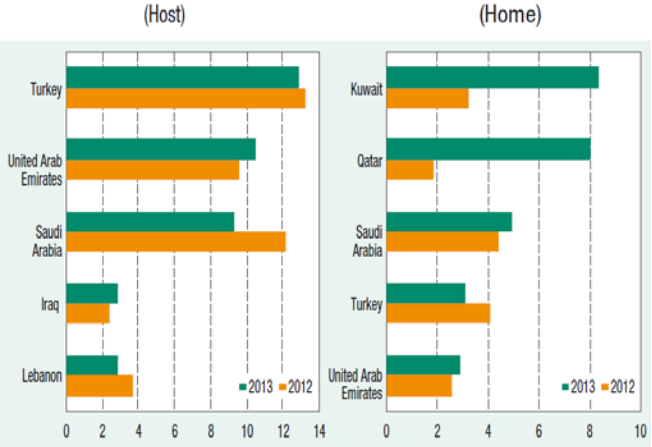
India represents basically the only notable country in South Asia, even if its performance related to outflows shrank in 2013. The whole sub-region registered a growth of 10% for FDI inflows, even if the total amount of announced Greenfield projects dropped dramatically by 38%. In contrast, the growth was led by the growing amount of cross-border M&A which rose by 70%, mainly due to some big acquisition of foreign companies in India. The macroeconomic uncertainties continue to be a concern for investors in India, which is still the dominant recipient and investor in South Asia, but with significant problems. The inflows, grew due to some big acquisitions (Relay from Netherlands and Mylan from United States) while Indian firms saw their outward FDI drop to merely $1.7 billion in 2013. Probably, this is a consequence of the domestic economic problems which seem to have deteriorated the international expansion capabilities of firms. Facing a weak economy and high interest rates at home, some Indian companies with high financial leverage sold equity or assets in order to improve cash flows. The according result was a reverse equity investment from $2.2 billion in 2012 to $-2.6 billion in 2013.

The Indian rupee depreciated significantly during 2013 and, together with high inflation, they have contributed to pose some doubts on foreign investors. Moreover, the recent round of retail liberalization in 2012 made by the Indian Government in order to boost investments and improve efficiency has not yet generated the expected results. The organized retail sector in India is expected to grow to a market worth $260 billion by 2020 accordingly to Boston Consulting Group forecasts. In 2006 with the first round of liberalization in the retail sector, there was a jump in the annual FDI inflows compared to the years before, from merely $60 million on average to over $700 million in 2009. However, after an initial boost, the policy lost its momentum and together with the world economic crisis the inflows diminished to a range between $390 million and $570 million in recent years. The second round of liberalization, with an opening up of multi-brand retail in 2012 is

not generating the same results as the first one. Perhaps the Government should follow different approaches in order to attract foreign FDI, like non-equity forms of TNC participation, and at the same time focus on solving the macroeconomics problems that are afflicting Indian companies and people.

Turkey remained ***West Asia***'s main FDI recipient in 2013, although flows decreased slightly, remaining at almost the same level as in the previous year – close to $13 billion. United Arab Emirates is still growing in terms of inflows and gained the second position by narrowing the gap with Turkey that presented a decrease for the second consecutive year (see figure 4.10). After a small decrease in 2012, Kuwait regained momentum in 2013 by increasing its outward investments performance (increase of 159%) and by strengthening its first position. Qatar followed the same path and jumped from fifth position to second. Meanwhile, Turkey saw its FDI outflows performance decrease following its growth in 2012.

Figure 4.10: FDI flows, West Asia, top 5 host and home economies, 2012–2013 (Bln $)



Source: World Investment Report 2014, UNCTAD.

Inward FDI remains uncertain for the region and for Turkey mainly due to rising political issues, which affect not only the directly interested countries but the other countries as well. The FDI flows to/from the West Asia region would have been much more substantial without the presence of such political turmoil. However, FDI outflows from West Asia in total rose by 64% mainly boosted by rising flows from Gulf Cooperation Council[15] countries, which thanks to their relative small sized economies and high levels of foreign exchange reserves, they likely will continue to increase their effort in undertaking outward FDI practices.

The entire region, but especially the GCC countries and their petrochemicals industry, is facing new challenges arising from the new shale gas revolution in North America. Together with the aim of developing even more the internal industrial capabilities of the oil and gas sector, the goal of diversifying their economies is also present. GCC Governments have undertaken since the mid-2000s the development of large scale petrochemicals projects in joint ventures with international oil companies, which resulted in a significant expansion of the region's petrochemicals capacities. Simultaneously, some MNCs of GCC countries are

[15] The GCC is a regional intergovernmental political and economic union including all Arab states of the Persian Gulf excluding Iraq. That is, its member states are the Islamic monarchies of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

starting to invest in North America in order to exploit the shale gas boom. The main example is the Abu Dhabi's State-owned International Petroleum Investment Company: NOVA Chemicals, among the first in investing in plants overseas to exploit the low-cost North America ethylene. Rather than focusing on expanding capacity, they need to leverage their partnership with petrochemicals MNCs to strengthen their knowledge and skills base in terms of technology, research and efficient operations, and to establish linkages with the global manufacturing MNCs that use their products.

Latin America and the Caribbean was able to attract investment up to $292 billion, excluding the offshore financial centres they increased by 6% to $182 billion. The outflows of FDI declined to a level of $115 billion and if we exclude again the financial centres the decrease is about 31% to a total amount of just $33 billion. It appears clear from the following graphs (figures 4.11a and 4.11b) that the most important share of outflows is related to offshore financial centres, where basically the capital is only passing through, while the contribution of South America and Central America without financial centres is relatively small.

Figure 4.11a: FDI inflows 2007–2013 (Bln $)

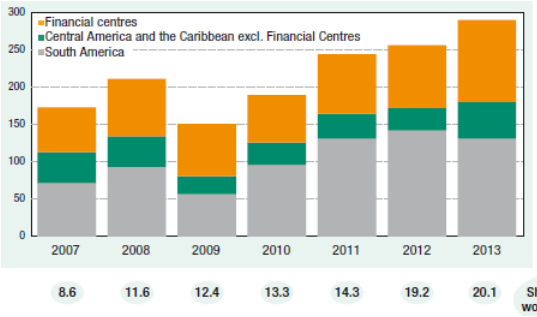
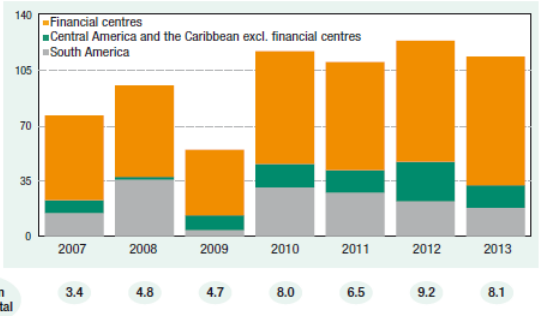


Figure 4.11b: FDI outflows 2007–2013 (Bln $)



Source: World Investment Report 2014, UNCTAD.

After three years of consecutive strong growth, FDI to South America decreased and Central America and the Caribbean continued to drive FDI growth to the region. The biggest performance was by Mexico, but mainly due to one mega-acquisition of Grupo Modelo by a Belgian company for $18 billion, which more than doubled inflows of the country. Significant growing rates have been registered also in Panama and Costa Rica, as a result of infrastructure investment projects in the first case and by nearly tripling the real-estate acquisitions by non-residents in the latter.

Brazil registered only a slight decline from 2012 of 2%, reaching a level of $64 billion Flows to the primary sector soared by 86% to $17 billion, powered primarily by the oil and gas extractive industry (up 144% to $11 billion), while flows to the manufacturing and services sectors decreased by 17% and 14%, respectively. FDI to the automobile and electronics industries bucked the trend of the manufacturing sector, rising by 85% and 120%, respectively. FDI outflows, as already mentioned, reached $115 billion in 2013 and excluding offshore financial centres, they declined by 31%. The decline is the result of both a 47% decrease in cross-border acquisitions from the high value reached during 2012 ($31 billion)

and a strong increase in loan repayments to parent companies by foreign affiliates of Brazilian and Chilean TNCs.

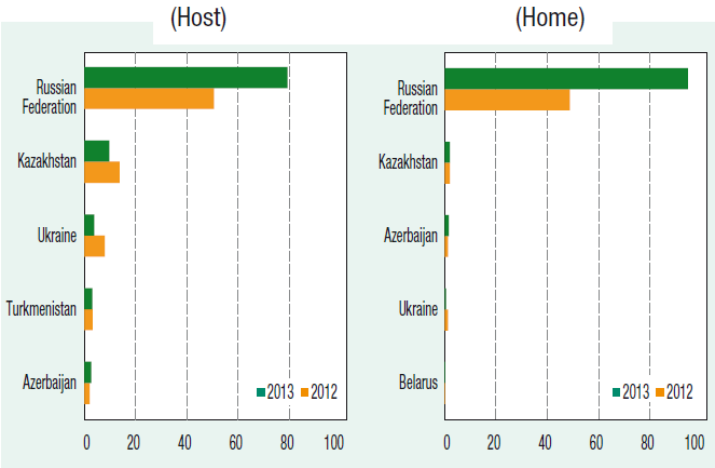
FDI prospects will be strongly influenced by the developments in the primary sector, especially related to the new opportunities in the shale oil and gas industry in Mexico and Argentina. YPF (Yacimientos Petroliferos Fiscales) is the state-owned energy company which is the main player in the Argentinian market and it has already secured some investments, like a $1.2 billion joint venture agreement with Chevron (United States). Indeed, Mexico is going to have a tremendous boost from the ending of 75-year state monopoly of the oil sector, which will open up opportunities for foreign investment as well. In the manufacturing sector, the two main economies for FDI are Brazil and Mexico; however they are implementing different strategies. The latter resulted to be export-oriented by an efficiency-seeking behaviour, while Brazil tends to be more domestic-market-oriented. As a result, these different strategies generated different export structures in the two sub-region (South America vs Central America and Caribbean) and two different participation patterns to Global Value Chain. Due to Brazil's strategy, the whole sub-region resulted to be more focused on primary products and commodity-based manufacturers, while Central America presents a predominating tendency towards exports and manufactured products.

The main example is the automobile sector, where Brazil and Mexico are respectively the seventh and eighth largest automobile producers and the fourth and sixteenth largest car markets, globally. The Brazilian automobile value chain is strongly domestic-market oriented; in which only 13% of vehicle production is exported (67% of exports are absorbed by MERCOSUR[16] countries). On the other hand, in 2012, Mexico exported 82% of its production in the automobile sector, with 64% of it going to US as end market. Brazil, however, instead of relying on low labour cost as a fundamental factor like Mexico, it is leveraging on the advantage of having a large internal and regional market. That characteristic, coupled with a government policy introduced in the 2000s to provide greater incentives for innovation, R&D and development of domestic productive capacity, have led to more integration of local suppliers into the automobile value chain, the development of local innovation and R&D capabilities and the significant attraction of international FDI.

[16] Mercado Común del Sur. Sub-regional bloc comprising Argentina, Brazil, Paraguay, Uruguay and Venezuela. Its purpose is to promote free trade and the movement of goods, people, and capital.

Transition Economies registered a record level of FDI flows to/from in 2013. The Russian Federation was the world's third largest recipient of FDI and the world's fourth largest investor, mostly due to a single large deal (see below graph).

Figure 4.12: FDI flows, Transition economies, top 5 host and home economies, 2012–2013 (Bln $)



Source: World Investment Report 2014, UNCTAD.

In total, the amount of FDI inflows to transition economies increased by 28% in 2013, reaching a value of $108 billion with Russia as a main (and only) driver of this growth. In fact, inflows to Kazakhstan and Ukraine declined principally due to the political instability of the two countries and especially of the latter one. In South-East Europe most of the FDI inflows were driven by privatization processes in the service sector. Albania and Serbia are the two main examples, where FDI literally jumped when compared to the year before, thanks to the acquisition of public owned companies by foreign investors from Azerbaijan and Abu Dhabi (UAE). Developed economies remain the main investors in those countries, even if the presence of FDI coming from developing economies has been on the rise (China especially). The outward performance has jumped as well, increasing by 84%, but as briefly mentioned above this is due mainly to one mega-acquisition that took place in Russia Federation. The second and third active economies on the FDI outflows scene are Kazakhstan and Azerbaijan respectively, even if the gap between these countries and the Russian economy is in the range of round $80 billion. Almost all (95%) of the outward stock from South-East Europe and CIS countries (Commonwealth of Independent States) is due to the expansion abroad of Russian TNCs with market-seeking aims.

Russia Federation appears clearly as the most important recipient and investor among those countries, particularly if we consider BRICs countries it presents the highest growing rate compared with 2012. The Russian Federation saw FDI flows grow by 57%, reaching $79 billion. Foreign investors were motivated by continued strong growth in the domestic market coupled with productivity gains. They primarily used intra-company loans from parent companies to finance these investments. Investors also continued to be attracted by high returns in energy and other natural-resource-related projects. The FDI growth was also due to the acquisition by BP (United Kingdom) of an 18.5% equity stake in Rosneft (Russia Federation) as part of a bigger deal between those two companies. As a result, in 2013 the

UK was the largest investor in the Russian Federation for the first time, accounting for an estimated 23% of FDI to the country. This equity stake investment was part of the payment for the acquisition made by Rosneft of TNK-BP (BP received also $12.5 billion in cash), whereas the other owner (A.A.R. Consortium) which was an investment vehicle based in British Virgin Islands was paid all in cash. This huge deal had a double effect on FDI data of Russia Federation, since $55 billion was added to the outflows as the total paid by Rosneft to complete the acquisition and, at the same time, by paying BP half with equity stake participation, the result was an increase in the FDI inflows as well.

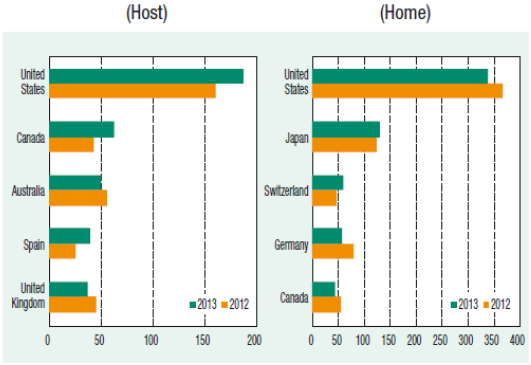
The prospect for the future remains uncertain, mostly because the regional conflicts tend to deteriorate the investors trust and the deepening stand-off between the EU and the Russian Federation over Ukraine might affect their FDI relationship. Especially, because European Union has the largest share of inward stock in transition economies, accounting for more than two thirds of the total and about 60% of Greenfield projects and M&A have Russia as a target. Indeed, it seems that all tensions are not affecting FDI from developing countries in the same way with the Russian Direct Investment Fund – a $10 billion fund to promote FDI in the country – very active in fostering partnerships and relationships with foreign investors (I.e. Abu Dhabi Emirate).

Developed Economies after the great decrease of 2012 for both inflows and outflows, in 2013 they show some tendency of recovery. The total amount of inflows grew by 9% to a level of $566 billion, while the outflows reaching $857 billion were almost unchanged compared to 2012 ($852 billion). Despite the overall increase in inflows, recovery was concentrated in a smaller set of economies; only 15 of 39 economies registered a positive trend. Inflows to Europe were $251 billion with a growth rate of 3% over 2012, where Italy and Spain were the best performers with a robust recovery (Spain received the largest flows in Europe in 2013). In the meanwhile, inflows to North America rebounded to $250 billion with a 23% increase, making United States and Canada the largest recipients among developed economies. The increase was primarily due to large inflows from Japan in the US and a doubling of US FDI to Canada. The third host economy between developed countries resulted to be Australia, even if it is registering a declining trend of 12%, to $51 billion.

Figure 4.13: FDI flows, Developed economies and top 5 host and home economies, 2012–2013 (Bln $)

Range	Inflows	Outflows
Above $100 billion	United States	United States and Japan
$50 to $99 billion	Canada	Switzerland and Germany
$10 to $49 billion	Australia, Spain, United Kingdom, Ireland, Luxembourg, Germany, Netherlands, Italy, Israel and Austria	Canada, Netherlands, Sweden, Italy, Spain, Ireland, Luxembourg, United Kingdom, Norway and Austria
$1 to $9 billion	Norway, Sweden, Czech Republic, France, Romania, Portugal, Hungary, Greece, Japan, Denmark and Bulgaria	Denmark, Australia, Israel, Finland, Czech Republic, Hungary and Portugal
Below $1 billion	New Zealand, Estonia, Latvia, Slovakia, Croatia, Cyprus, Lithuania, Iceland, Gibraltar, Bermuda, Slovenia, Finland, Malta, Belgium, Switzerland and Poland	New Zealand, Iceland, Estonia, Latvia, Cyprus, Bulgaria, Romania, Lithuania, Slovenia, Bermuda, Malta, Croatia, Slovakia, Greece, France, Poland and Belgium

[a] Economies are listed according to the magnitude of their FDI flows.



Source: World Investment Report 2014, UNCTAD.

The increasing level of outflows from developed countries was more widely shared, with 22 economies presenting an increase. Outflows from Europe grew by 10% to $328 billion, of which $250 billion intra-EU flows, with Switzerland becoming Europe's largest direct investor. European FDI flows have fluctuated considerably from year to year and they presented diverging trends among major European countries.

The two main examples are Germany, which saw inflows more than double from $13 billion in 2012 to $27 billion in 2013 and France, where in contrast, inflows declined by 80% to $5 billion. Compared to Europe, outflows from North America lost another 10%, slipping to $381 billion. The effect of an increase in reinvested earnings abroad by US TNCs, was countered by the increasing transfer of funds back to Europe as decline of intra-company loans. Outflows from Japan rose for the third successive year, rising to $136 billion, led not only by big investment in the US, but also by market-seeking FDI in South-East Asia which helped Japan strengthen its second position as largest direct investor.

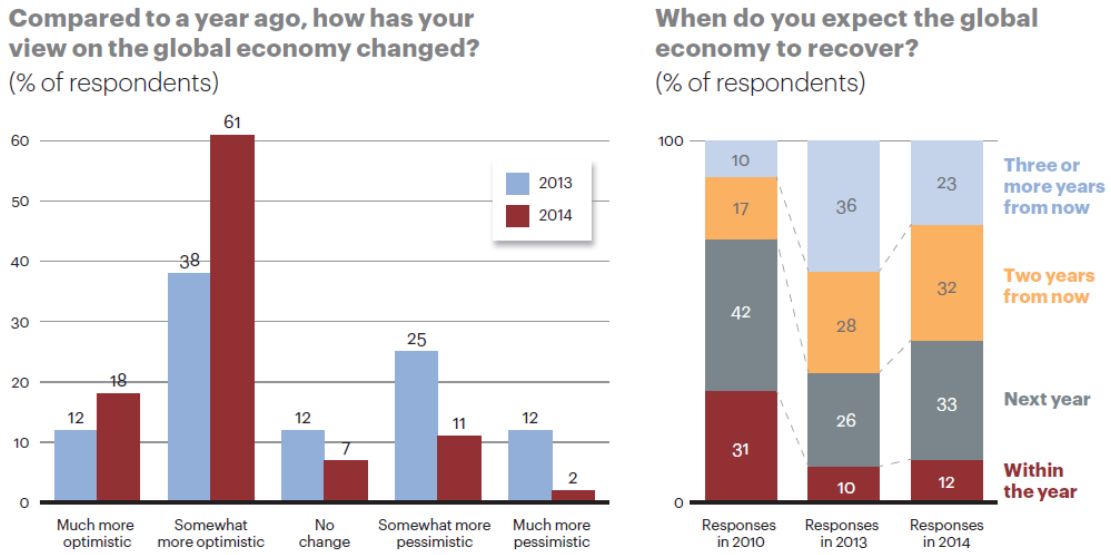
Special interest required the evolution of the negotiation of Transatlantic Trade and Investment Partnership (TTIP), commenced in summer 2013 and supposed to finish by 2015 or in early 2016. If the agreement successfully takes place, it will lead to the creation of the world's largest free trade area with considerable repercussions over FDI intents and policies. It must be considered that together EU and US represent more than 45% of global GDP and FDI among those countries constituting on average half of the global FDI flows.

4.2.3 FDI CONFIDENCE INDEX

The A.T. Kearney Foreign Direct Investment Confidence Index analyses predominant trends, and ranks countries by expectations on FDI variations due to political, economic, and regulatory changes in the coming years. It provides insights by business leaders' economic outlook. The FDI Confidence Index is calculated as a weighted average of the number of high, medium and low responses to questions about the likelihood (expectations) of direct investment in a market over the next three years. Index scores depend on non-source-country responses. Higher Index scores are associated with more attractive investment targets.

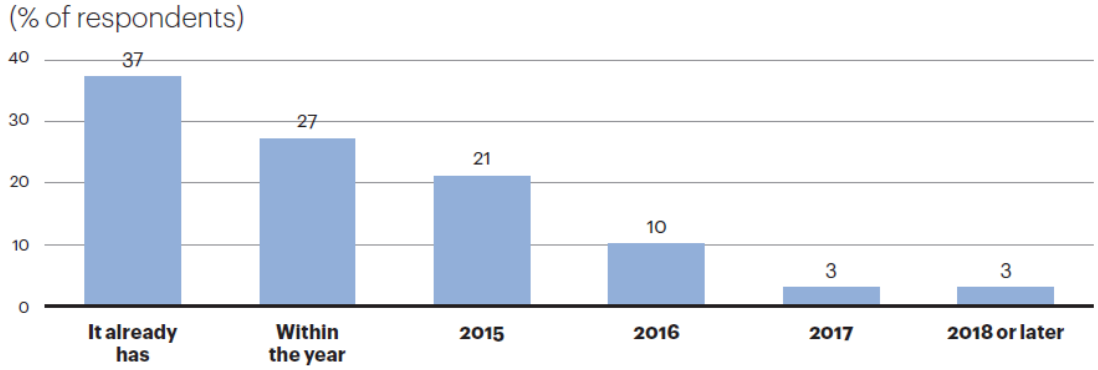
The A.T. Kearney Foreign Direct Investment Index analyses trends and ranks countries according to how changes in their political, economic and regulatory systems are likely to affect FDI inflows in the following years. It is constructed by employing main data from a proprietary survey administered to senior executives of the world's leading corporations.

Figure 4.14: changing outlook on the global economy



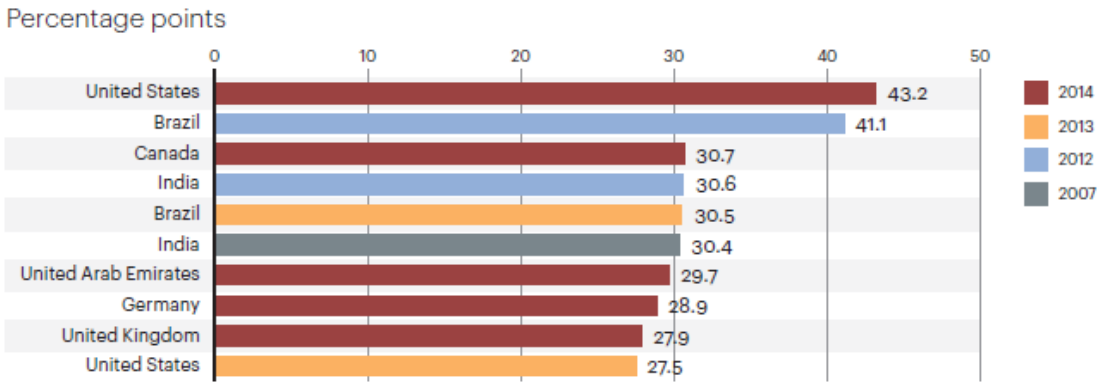
Source: A.T. Kearney Foreign Direct Investment Confidence Index®, 2014.

Figure 4.15: When will your company's FDI return to its pre-crisis level?



Source: A.T. Kearney Foreign Direct Investment Confidence Index®, 2014.

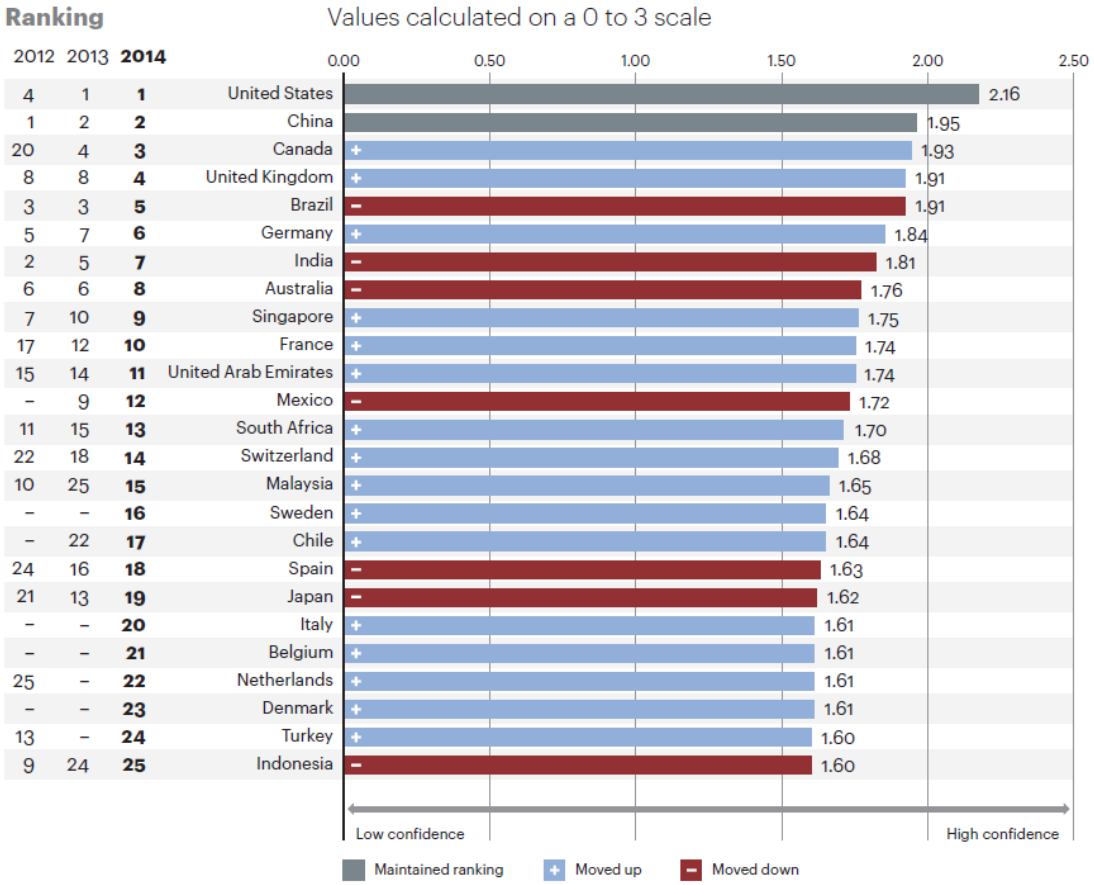
Figure 4.16: differential between positive and negative outlook for top 10 (2007-2014)



Source: A.T. Kearney Foreign Direct Investment Confidence Index®, 2014.

Looking at the FDI confidence index, despite the slow and uneven economic recovery, business leaders now feel more confident about the global outlook. This optimism is leading to increased FDI levels during this year, and has the potential to become a self-fulfilling prophecy.

Figure 4.17: 2014 FDI Confidence Index® ranking and scores



Source: A.T. Kearney Foreign Direct Investment Confidence Index®, 2014.

These results are likely to reflect the actual strategic plans of MNCs since several countries are pursuing ambitious trade liberalization policies affecting positively FDI expectations and actual results.

Asia Pacific

Asia lures nearly one third of overall FDI and it continues to be a top destination. This region is showing more resilience than others in spite of the investors' continuing reluctance. **China**'s second position (first in 2012) is led by its populous consumer market and highly developed manufacturing base, but not any more by low cost labour force given the rapid wage increases and rising transport costs. India is losing positions (from fifth to seventh) because of the limits imposed by the government on FDI in telecommunications, credit information, defence production, and asset construction.

Australia (from sixth to eighth) appear to have been hurt by global commodity slowdown, but still remains within the top ten (for the fourth time in a row) thanks to its diversification

strategy, high-technology manufacturing, and innovative products. Moreover, it is home for significant R&D facilities.

Singapore gains one position (9th) but there remain good expectations, beyond the good regulatory framework, low corporate tax rate, talented workforce, and significant R&D headquarters, for the possibility of free trade between EU and ASEAN countries.

Malaysia (15th) is attempting to move up by exploiting its competitive position in electronics, automotive, and manufacturing.

Japan is losing position (19th) but is still attracting investors by means of significant regional headquarters, logistics HUBS, and R&D locations, fostered by its large market size and talented workforce.

Indonesia (25th) is still growing led by a consumption-driven and resource-rich economy, but its unsecure regulatory system discourages investors.

Americas

This area has been performing well in the late years, mainly led by **United States** (first place) and Canada (third), followed by Brazil and Mexico with good scores as well (respectively 5th and 12th). Chile is improving too (from 22nd in 2013 to 17th in 2014). Latin America keeps encouraging investors by boosting its middle class and energy markets, especially thanks to NAFTA renascent manufacturing base. In addition, no other country, other than the US, has reached the same level of optimism after the great recession. Over the last two years, the US has carried out its first-ever national investment promotion effort, SelectUSA, which provides one-stop shop for foreign investors to receive advice on starting a business. A further luring feature is represented by the energy sector revolution due to the expansion of shale gas production.

Canada reaches its new all-time peak thanks to its high-tech expertise, and high-skilled workers, particularly focused on R&D.

Brazil is included within the top five destinations and, in particular, represents an increasingly frequent destination for the other emerging markets.

Mexico falls by three positions compared with the previous year, but it still represents significant beneficiary of the extensive ties with the US economy (low labour and logistic costs) as an attractive location for final assembly of components.

Chile is rising in ranking thanks to its stable economy and investment climate.

Europe

The **United Kingdom** gains positions, in spite of the uncertainty due to the announcement of an in-out EU referendum, especially since London is still one of the world's premier business HUBS as home for several global headquarters.

Germany keeps luring investment (sixth) since it represents the world's leader in advanced manufacturing location and a safe and rewarding business environment.

Top ten destinations include **France**, rewarded by its effort to increase its own competitiveness, especially by making public expenditure more efficient and administrative processes simpler.

Switzerland keeps raising its position (14th) thanks to its exceptionally high level of life quality and competitive business environment.

Sweden's high-skill labour force and innovation enable the Scandinavian country to be included into the index for the first time.

Belgium's attraction depends mostly on its large number of logistic and life-science industries.
Netherlands has had a more difficult time than other Northern European countries but, has attracted high-quality investments thanks to its strategic location, sound business environment, and talented workforce.
Denmark keeps gaining position by means of a lower corporate taxation, an increasing R&D tax credits, and other measures fostering competitiveness.
Turkey returns to the index as a fundamental platform between Europe and the Middle East and a large domestic market.

Middle East and Africa

UAE takes back its 2010 position following the opening of new areas for foreign investment.
South Africa moves up two spots mainly as a result of the prominence of large M&As.

Investors' Expectations

The index described as well as investment analysis, in general, is mainly based on likelihood and expectations, features that highly involve uncertainty and requires theories beyond the traditional economic ones to well understand them.

Investors are still concerned about economic uncertainty, but the worst is expected to be over. Companies are eager for investments with attractive risk-adjusted returns. Late trade agreements and recovering global economic growth are likely to push up FDI trends. After the Great Recession, companies have started to look at strategic plans with a new perspective especially by monitoring global macroeconomic trends. They are more chastened by trends volatility and uncertainty, so they try to monitor them more closely.
Most world countries are carrying out aggressive trade liberalization policies affecting FDI. The Trans-Pacific Partnership trade agreement negotiations now include the United States and another 11 countries. At the same time, the US and the EU are attempting to realize the largest free trade agreement in the world. Transatlantic Trade and Investment Partnership (T-TIP) is expected to raise combined US and EU nearly $300 billion. All these negotiations have already affected companies' leader plans on FDI allocations.

4.2.4 A BEHAVIOURAL APPROACH

Behavioural finance seems to get a better picture of the reality than standard economic theories. Exploiting behavioural finance may be more suitable to explain the determinants of financial crises and prevent them rather than stopping them afterwards. In spite of this field's findings, its practical applications are still limited to improving investment strategies. For instance, investors could exploit the behavioural bias of other market participants, attempting to invest before most of them recognise their error.

LIMITS TO FDI ECONOMIC THEORY

Simon (1955) argued that economic agents often play in order to "satisfice" rather than optimize. This is why the rational economic theory is not considered reliable to explain investors' behaviour.

It is increasingly acknowledged that the higher the uncertainty level the better behavioural studies can identify key variables affecting FDI location decisions. FDI analysis is usually focused on the several determinants of the investment and their changing role, but sometimes it would be more suitable to enrich this theory looking at the manager behaviour whose role is crucial in this decision making process.

Assessing whether to invest locally or overseas, a rational decision maker wants to maximize the net present value of his investment. For this purpose, he needs to collect information and assume or compute a given discount rate correlated with the investment risk. Substantially, this decision depends above all on the manager's expectations.

Previous literature shows several variables affecting costs and benefits form FDI. MNCs deciding about foreign investment attempt to increase profit in different ways, such as exploiting specific advantages (marketing skills, innovation and technology, cheaper access to capital, etc.) over local competitors in the host economy in order to compensate the additional cost of investing abroad.

As explained by Knickerbocker, firms across the same industry are likely to invest in the same (host) markets in order to mitigate risk and to exploit the possible "second-mover advantage". In the proximity-concentration model, Horstmann and Markusen (1992) explain the two-way horizontal FDI when it becomes cheaper than exporting.

The attempt to be more cost-efficient is another potential driver of FDI location decision. Additional explanations are provided by the fragmentation of production processes into different levels based on different relative factor endowments.

The main behavioural approach was developed by the Scandinavian school, which looks at the "physic distance" as a key factor for the location decision. Johanson and Vahlne (1977), in particular, analysed the differences in language, education, business, culture and industries.

All these views are valid but simplistic within decision making models. Actually, FDI decisions require a considerable amount of information, and consist of small sequential decisions taken over time through a long-term perspective. Simultaneously, variables affects FDI are changing unpredictably, and decision makers may be affected by various events. A deeper view of FDI decision has to include the behavioural components, like the significance of managers' cognitive characteristics.

Other relevant variables are, of course, the uncertainty and incapability to assess the changing complexity of the environment.

To sum up, behavioural rules are generally usual choices typified according to their location over time. Behavioural economics studies exploit psychology background to complement the traditional approach incapable to understand the complexity of decision making processes.

BEHAVIOURAL RULES TO ASSESS FDI

According to the work of Pinheiro Alves (2008), behavioural rules are valid to explain information collection and selection, and the final FDI location decision. The taxonomy of these rules is presented in the table below.

TABLE 4.5: Taxonomy of Behavioural Rules

TYPE	Intrinsic	Extrinsic
Past	Learning, Hindsight bias, Sunk costs, Mental accounting, Break-even effect, house money effect	Historical anchoring, Cultural anchoring
Present	Framing, Representativeness	Availability, Feelings, Fairness, Herding, Cascading, Signalling, False consensus bias, Reputation-biased herding, Inter-expert inconsistency
Future (strategic inconsistencies)	Overconfidence, confirmatory bias	

Source: Pinheiro Alvers, R. (2008). *Behavioural determinants of foreign direct investment*.

The first row refers to the past. Mental accounting may explain investment decisions but not their exact location since risk taking agents are differently influenced by prior gains and losses. Past experiences of managers are not taken into account. Findings from Thaler and Johnson (1990) indicate that people may be more risk-averse when investing to earn money and more risk-lover when having the prospect of losing because they fail to adapt to recoverable losses. Accordingly, a recoverable loss might induce adventurous behaviours, revealing that decision makers are more willing to invest more in faltering ventures if they believe they could recover present losses. The same authors find that investors with prior gains may be more willing to take higher risk ("house money effect") as long as the potential loss is lower than the prior gain. In this situation, investors are comfortable in taking controlled risks and losses, a clear situation of mental accounting, that explains how past (good) experiences affect current decisions of managers.

Strategic inconsistency arises when firms' strategic plans are not long-term-based. There cannot be profit maximization without a clear strategy.

In regards to the future, expectations may lead to overconfidence when relevant information is not taken into account, leading in turn to suboptimal decisions. In fact, managers tend to overestimate their control over variables, likely to be emphasized by mistaken beliefs and illusory correlation. Overconfidence may be entailed even by the trend of economic agents to interpret information confirming their prior beliefs.

One of the most significant rules, among the extrinsic ones, is the anchoring, that is when behavioural outcomes are affected by the specific starting point employed in order to assess

the social state (Frey, 2001). There is evidence about the relevance on how historical and cultural practices affect present behaviour. The cultural and historical backgrounds are strictly correlated since the former one may be originated by the latter one determining the concept of "physic distance".

Moving to the second row, the present type, normal and regular events are usually underestimated, while recent or well publicized events tend to be overestimated. This bias is likely to affect FDI decisions since in those situations; events' frequency is evaluated by the ease with which its occurrence is remembered (Tversky and Kahneman, 1982). Indeed, individual behaviour is based on both private information and others' influence but the latter prevails over the former leading to similar decisions.

In addition to these rules, moral constrains should be taken into account, from family, friends, institutions, and so on.

The Role of Risk and Uncertainty

Among the FDI location's aim other than making profits, the attempt to mitigate risk and uncertainty associated with the markets has resulted crucial according the latest literature. This view complements the traditional one on FDI.

For instance, expectations are assumed to be inherently uncertain and to reflect people knowledge and attitudes, as well as their behaviour to prepare for events in advance. We can observe that by looking at a simple intertemporal investment choice. The decision makers, aiming at long-term profits, have to take into account expectations through the discount factor, or "time preference".
The discount factor is often assumed as equal across firms but it is unlikely to be so, entailing further complications.

Heiner proposed the Competence-Difficulty Model (1983; 1985) comparing the competence with the difficulty of agents in selecting most preferred alternatives in decision making. The gap between these two features reveals uncertainty about how to employ information in decision making. The model focuses on two kinds of variable, environmental and perceptual. The former one constitutes of the influence from time in the different environmental (economic, political and cultural) backgrounds, whereas the latter one indicates how agents perceive the connections between their behaviour and the environment that is how they react to information. In particular, this second features includes both individual intrinsic and extrinsic characteristics. The gap between these two variables (difficulty and competence) leads to the degree of uncertainty (U= D - C). The higher the instability, the more unreliable is the decision making process leading managers to need complementary behavioural rules to face uncertainty and reach a final decision.

Evidence

In order to complement economic theory about FDI decisions, we increasingly need a behavioural approach. Previous literature show that behavioural rules are able to explain

about 50% of FDI location decisions (Pinheiro Alves, 2008). In particular, the C-D model predicts that decision makers rely on actions adaptable to recurrent situations while ignoring actions that are appropriate in unusual circumstances. Economic theory should start focusing more on how decisions are made and not only on why.

However, the behavioural approach needs to focus more on understanding the role of contextual issues like the influence of each firm's culture and history and the individual characteristics of managers, including culture and other moral variables. This way, we could be able to find further determinants for this study.

SUBJECTIVE WELLBEING AND LIVEABILITY AS ATTRACTIVENESS STRATEGY

Liveability of territory (life quality perception) has been considered as a strategic driver towards entrepreneurship and competition. This feature includes several aspects such as life quality, environmental sustainability and competitive economy.

There is evidence showing that life quality appears to be an asset for investment attraction and a competitive advantage that every country should enforce in order to receive FDI.

Technological innovation has been a key to the knowledge economy success. So far, we have assessed it mostly according to an organizational and explicit objective outcome of knowledge creation capacity of a country. However, subjective wellbeing has increasingly become a key feature of the human capital which positively affects developing countries. It may particularly be interesting to look at the relationship between the independent inventors and subjective wellbeing like Wicramasinghe et al. tried to do with Sri Lanka data (2011). This non-high income country is characterized by inventors being successful subjectively but not objectively. That is, they feel happy about what they achieved, and it might depend on their assessment of existing objective outcomes and optimism on what they are hoping to achieve in the future. There is empirical evidence suggesting that subjective wellbeing of independent inventors might lead them to keep committing to innovate even under not favourable conditions.

More and more competitive states, such as Singapore, put a lot of effort and resources in trying to achieve a high grade of liveability and subjective wellbeing in general. From Singapore's experience, life quality clearly is an asset for investment attraction and a competitive advantage that all regions interested in receiving FDI should endorse.

Stockholm's case study is a good and complete example for understanding how considerations about quality of live have been implemented in a location which has been defined, by fDi Intelligence of The Financial Times, European Region of the Future. Cities and regions are evaluated according to six categories: economic potential, human resources, cost effectiveness, quality of life, infrastructure and business friendliness. In addition to these criteria, the FDI promotion strategy is also considered, using detailed information about promotion strategy. The most striking results show that countries can be attractive for the

ICT sector regardless of the economic situation, i.e. thanks to the transparent and creative business environment.

FDI PREDICTION

Probability of FDI

In spite of the well spread use of probabilistic models in studying FDI models, there is not enough focus on the role that FDI factors play on the probability of an FDI relationship between two countries, mostly because of the lack of data. It should be examined deeply given the acknowledged importance of FDI factors, in particular, looking at policy and non-policy determinants. For instance, Gusinger and Loree (1955) find empirical evidence supporting the significance of some non-policy variables like political stability, cultural distance, GDP, and infrastructure. The distinction between policy and non-policy variables is arguable, but the focal point is given by considering the effects of these factors on policy-making aimed at raising FDI attractiveness.

In these studies, the use of probabilistic models, such as probit and logit, is very frequent since they are characterized by research questions with qualitative properties.

Predicting FDI probability

Brandao de Brito and De Mello Sampayo (2003) investigate the optimal timing and probability of FDI in a context of uncertainty and irreversibility (of the investments). They find that FDI is likely to take longer in the presence of higher **uncertainty related to the future** path of **attractiveness** in both locations and higher the **share of capital committed** by the firm to the host country. On the other hand, it is likely to occur sooner if associated with a higher level of foreign **attractiveness of home** country, higher **discount rate** and **correlation between attractiveness** in both locations. Indeed, as previously asserted, FDI entry results to negatively depend on the host country's attractiveness volatility, on relative labour costs and on the share of capital already invested in that location. The entry of firms depends positively on the discount rate and on the correlation between the attractiveness of home and host countries. Therefore, as the empirical evidence shows (Brandao de Brito and De Mello Sampayo, 2003) FDI depends not only on the relative attractiveness but rather on the uncertainty about the potential attractiveness

Increasing FDI likelihood

FDI flows can be crucial from several points of views for a country. Previous literature suggests countries use institutional and cultural channels to promote their familiar and reliable results according to investors abroad (Vasileva, 2011). From the institutional size, joining international organizations or agreements could be a good strategy while, from the cultural point of view, shared language and history result prominent factors (Asia-Pacific region). Among the other key variables reported in literature, openness to trade results particularly significant.

Limits to research

Currently, there are several limits to this analysis. It would be desirable to extend it to industry and firm level, but present data does not appear to be able to support this. In fact, there is shortage of bilateral datasets about the FDI flows preventing any analysis across

industries. Other limits can be found in the investment motivations of MNCs. They often do not have much choice since they are resource-oriented and dependent. Thus the near-home bias is not likely to be affected by physical proximity but rather towards more institutional or cultural familiarity. Furthermore, current databases do not provide any information on the FDI profitability.

4.2.5 FDI POLICY IMPLICATIONS

After analysing FDI trends, we need to conclude discussing the policy actions available to attract FDI. Some emerging countries are attracting increasing FDI flows, in particular R&D-intensive FDI inflows. However, many developing countries lack the wide and dynamic markets that BRIC countries can use as a bargaining tool to lure R&D, and they also lack the technological infrastructure, human capital, and specialized cluster that companies look for when they have to decide where to settle their R&D centres. Indeed, countries that fail to raise their technological capabilities are likely to be excluded by global innovation networks. Velde (2001) argues that pro-active and strategic FDI policy interventions, affecting the dynamic trends of national comparative advantages, are necessary in order to avoid the risk of a low-skill, low-income trap. Then, Lall (2004) asserts that the need for policy interventions has become stronger due to the fast development of globalization and technological advance. Attracting R&D-intensive FDI requires a more proactive intervention, unlike generic FDI policies which can rely largely on investment liberalisation along with marketing and promotion.

Developing countries usually face more hindrances in attracting R&D and need more relevant interventions from the government in order to solve or avoid market and the systematic failures. For instance, they face a market failure when, deciding the allocation of R&D centres within global innovation networks, they lack perfect information, leading to biased decisions. Accordingly, they need policy interventions in the form of FDI promotion. Another example of market failure is when, in R&D investment, firms are not sensitive to the positive externalities of knowledge creation and so they tend to under-invest in R&D. This would entail a need for policy interventions to improve the intellectual property rights.

Another justification for policy interventions in the systematic inefficiencies can be found (Smith, 2000). Policy makers are expected to intervene when the knowledge generation and diffusion system does not contribute efficiently to innovation and technological progress because of the lack of well-linked networks between the different agents of the system, due to various reasons, such institutional weakness. So, the government's role extends further to facilitating linkages and enhancing the dynamism of the national innovation system.

On the one hand, the role of innovation policy is to improve the investment climate for R&D by identifying the strengths and weaknesses of the national innovation system. On the other hand, the role of inward investment promotion is to improve the image of the country as an R&D location and to provide targeted services to both current and potential foreign investors in FDI.

TABLE 4.6: Policies towards inward R&D-intensive FDI

POLICY OBJECTIVES	CORRESPONDING POLICY INSTRUMENTS
Enhancing R&D investment Climate	• University, Research Centres, Science Technology parks • Human capital and foreign talent attraction • Fiscal and financial incentives to business R&D • Systemic policies to stimulate linkages and interaction • Intellectual property rights regime
Targeting R&D in FDI support	• International promotion of national technological capabilities • Pre-investment services to MNCs • Post-investment services to MNCs
Reaping the benefits from inward R&D-intensive FDI	• Building cluster and linkages around MNC subsidiaries • Supporting collaboration through R&D incentives

Source: *Global trends in R&D-intensive FDI and policy implications for developing countries* (Guimon, 2013).

4.3 LINKAGES WITH SMEs

There are a number of studies highlighting the FDI's potential benefits, to host economies, including additional sources of capital, technology and knowledge transfer, employment generation, skills enhancement and human capital development, and enterprise development through linkages and spill-over effects. They include increasing international trade integration too.

These potential benefits can be summarized in seven main types of linkages and spillover effects:

- Backward Linkages with Suppliers: new market opportunities for local firms.
- Forward Linkages with Customers, including marketing outlets, which may be outsourced.
- Linkages with Competitors: Foreign investors may set new standards, which local firms may seek to compete with.
- Linkages with Technology Partners: Some MNCs may initiate common projects with indigenous SME partners, including joint ventures, licensing agreements and strategic alliances, which are an important potential source of technology and know-how for firms in the host economy.
- Other Spillover Effects, including demonstration effects (investors demonstrate new and better ways of doing business to local firms), representing an innovation driver, and human capital spill-overs (trained personnel leave the inward investor to work for a local enterprise and/or set up their own business).
- Enhancing FDI-SME linkages in developing and transition economies.
- Understanding the rationale for clients (MNCs) outsourcing products and services to suppliers (SMEs with capability to meet stringent quality, cost and delivery standards of

MNCs) would clarify implications for SMEs and their development for enhanced FDI linkages.

Studies indicate four main reasons for outsourcing:

1. Productivity gains: Where suppliers are able to produce specialized inputs, the SME partner has a certain bargaining power and, simultaneously, they are likely to positively affect FDI.
2. Factor cost advantages (lower wage costs).
3. Numerical flexibility (overflow subcontracting, in response to demand peaks).
4. Functional flexibility (responding to fluctuations in demand) based on a multi-skilled workforce and flexible equipment.

After assuming sound macroeconomic policies and political stability (the lowest minimum condition that will attract FDI), enhancing FDI-SME linkages is a matter of implementing support measures to improve the competitiveness of local SMEs. Building the capacity of local SMEs will require facilitation by intermediaries.

A program of FDI-SME linkage support would need to consist of two distinct components:

a) a host of linkage promotion services, and
b) technical and management upgrading services, including training and consultancies to internalize the requirements of the MNC, complemented by access to finance to integrate any new technologies into the existing production process.

The linkage promotion program may involve all or some of the following elements:

- Improving the flow of information about potential local suppliers to potential MNC purchasers and about supply opportunities to potential suppliers through the development of a national Website and/or business directories,
- Organization of “meet-the-buyer” events, including visits to MNC production sites, seminars where the MNC clarifies its procurement processes, quality requirements, etc.

Cooperation between SMEs and MNCs

As asserted by Lassini (2012), SMEs' competitive action can be based also on a "supply-chain partnership" within fragmented industries serving customers who are in the process of concentration. Large firms can gain a lot from SMEs: growth in firm size, risk mitigation, limited new investments, greater production flexibility, technological innovation, and so on. All these results can be achieved through different channels, such as joint ventures, sub-supply networks, franchising, and many others. We can analyse the various forms of relation between MNC and SMEs by means of a simple model highlighting drawbacks, advantages and attractiveness conditions for SMEs.

MATRIX OF COOPERATION FORMS

	Moderate substitutability of MNC by SME	**High substitutability of MNCs by SME**
Moderate substitutability of SME by MNC	SME dependent on MNC	Independent firms
High substitutability of SME by MNC	Supply chain partnership	MNC dependent SME

Source: Annushkina, O.; Carcano, L.; Lassini, U.; and Visconti, F. (2012). *SMEs and Strategic Management: Tools and methods to fill the gap.*

MNCs' substitutability depends on the importance of the contribution of the SME, its number of costumers and the specificity of its investments to the large firm. SMEs' substitutability depends on the importance of the MNC contribution, alternative sources availability, the specificity of its investments and the confidence that the MNC will respect rules and obligations.

The cooperation forms shown in the figure have strategic implications for SMEs beyond economic benefits, such as strategic autonomy degree, learning opportunities, changes in the competitive positioning, and relationship risks.

The combination of the two high forms of substitutability leads to independent firms. In this case, the large one should be made aware of the mutual benefits of stronger cooperation and make itself more attractive by improving flexibility, innovation and research potential.

The combination of high substitutability of the SME by the MNC and moderate for the opposite form leads to a dependence relationship (no strategic autonomy) of the SME on the MNC, characterized by negotiations based on the price of goods traded, decisions based on the discrepant bargaining power of the larger firm, which will try to maximize the economic benefits of the relationship. In this situation, the SME has to make itself irreplaceable thus increasing its autonomy degree. The combination of the two moderate forms of substitutability generates a supply chain partnership, characterized by longer contract durations (compared to the previous situation), negotiation based on several factors (not only the price), and joint decision-making in which the SME plays a role, and sharing of the economic benefits from cooperation. In this case, the SME can strengthen the relationship through different channels like investing in innovation, by showing willingness to grow and learn operating methods of larger firms, and so on. In the case of dependent firms, the SME should grant exclusivity rights to the other one, or vice versa.

CHAPTER 5

SOUTH AUSTRALIA: THRIVING HUB

"South Australia is the place where people and business thrive". This is the vision of the Premier, J. Weatherill. His approach to government is based on a partnership between strong business, strong government and strong community (*Helix models*). The Premier's economic priorities and actions reflect this partnership. In one of the latest reports of the Government of South Australia, the ten economic priorities are identified as follows:

1. Unlocking the full potential of South Australia's resources, energy and renewable assets;
2. Premium food and wine produced in our clean environment and exported to the world;
3. A globally recognised leader in health research, ageing and related services and products;
4. The Knowledge State, **attracting various students** and **commercialising our research**;
5. A growing destination choice for international and domestic travellers;
6. Growth through **innovation**;
7. The best place to **do business**;
8. Adelaide as the heart of a vibrant state;
9. **International connections and engagement** promotion;
10. **Small businesses** have access to capital and global markets.

The first five priorities highlight five key sectors. The second five are priorities enabling and facilitating economic development across all parts of the South Australian economy.

5.1 KEY ECONOMIC PRIORITIES

PRIORITY 1

South Australia is characterized by abundant resources and a respected regulatory framework. To maximize benefits from the abundance of resources, they keep supporting exploration and development, and exploit the activities generated by mining and energy to create new intellectual property, jobs, and global business opportunities. They also keep protecting the natural environment ensuring a shared access to land and an efficient use of natural resources.

PRIORITY 2

The increasing world demand for high quality food and wine, combined with South Australia's strong reputation for food safety, biosecurity and product integrity, creates relevant opportunities for the region. Centres of excellence in food and agricultural research help them export ideas, intellectual property, products and services.

PRIORITY 3

South Australia is well-located to develop innovation in ageing, ensuring wellbeing and productivity, and can create world leading businesses around this market. The South Australian Health and Biomedical Precinct is one of the largest health precincts in the southern hemisphere, and adds to the state's reputation for health and biomedical **research and innovation**. The idea is to maximise research goals in order to lead to the development of new industries.

PRIORITY 4

Collaboration and co-investment between global and local industry and research institutions will drive the development of South Australia as a hub of **knowledge creation and innovation**, especially in mining, resources, and defence. The strong reputation for knowledge sharing and collaboration will lure a growing number of students from all over the world to sustain a rich pool of **talented workforce**.

PRIORITY 5

South Australia is characterized by a unique and compelling landscape and story attracting international travellers from around the world. The Government ensures that visitors are able to access the state easily. Then once they arrive, all the touristic system must work properly in terms of infrastructure and service offers, in order to always exceed their expectations.

PRIORITY 6

The business environment evolution of South Australia is based on the ability to employ new methods and **advanced technologies** in order to create globally competitive high-valued firms. Its innovation ecosystem is characterized by infrastructures, financing, information, institutions, and skilled people supporting companies to take risks and benefitting from the business changes rewards. Developed manufacturing and engineering projects in major research areas sustain an ecosystem composed of creative and innovative firms.

PRIORITY 7

South Australia offers several opportunities as a location to **do business**: high-skills workforce, high quality infrastructure, affordable land and a supportive government. The latter one is working to reduce hindrances to business growth and to ensure that **regulation supports** opportunity rather than create obstacles.

PRIORITY 8

Adelaide, the South Australian capital, is characterized by an **advanced economy**, **world-class universities** and a **thriving multicultural heritage**. It is pivotal that the capital competes nationally and internationally for people and investment and that it represents the cultural, economic and social hub of the state.

PRIORITY 9

The State's prosperity depends on its **international connections**, **alliances** and **exports**. It lures **FDI** connecting itself with overseas markets, capital and know-how. South Australia needs to keep working on its multiculturalism to attract people with new innovative ideas, entrepreneurship, cultural connections and capital.

PRIORITY 10

The growth, variety and elasticity of the State's economy mostly depend on **small business expansion** since more than 140,000 businesses, in South Australia, employ less than 20 people. This kind of business results to be the most effective to create **job opportunities**. Government and small businesses, in collaboration with banks and market researchers are determining local and international opportunities, accessing domestic and international markets and securing capital to make business and employment opportunities grow across South Australia.

5.2 INVESTING IN PROSPERITY THROUGH THE "DI" ENVIRONMENT

"*Transformation of knowledge, combined with business creativity, leads to new products and market opportunities*" (Economic Statement 2013, Government of South Australia).

The Government of South Australia is committed to an economy which encourages the creation of innovative and outward looking enterprises, which collaborate with each other and internationally for their mutual benefit. In this way South Australia can contribute to Australia's economic prosperity and growth. This necessarily involves the transformation of South Australia's traditional sectors, such as manufacturing, into sectors heavily based on intensive knowledge.

The report of the Australian Council of Learned Academies (ACOLA) 'The role of science research and technology in lifting Australian productivity', commissioned by the Chief Scientist for the Prime Minister's Science, Engineering and Innovation Council (PMSEIC), has pointed out three major conclusions:

1) Building Australia's future industries will depend on adopting technological innovation to develop high-value products and services for a global market.

2) Improving collaboration in Australia, between businesses and between business and publicly funded research, will significantly enhance innovation. International collaboration is also critically important. Both domestic and international collaboration improves the productivity and competitiveness of Australian technology-based firms.

3) An innovative workforce that combines technical and non-technical disciplines, and enables good business management, is essential to underpin the competitive advantage of Australian industries and realise opportunities to lift productivity.

The three conclusions lead together to the importance of both innovation and internationalization in the nowadays economy, which ultimately are the main drivers of this report. South Australia's economy heavily relies on **small businesses** and, in particular, on **entrepreneurs** who are willing to take a risk and **innovate**. A focal point is provided by addressing the market factors that hinder the creation of new generations of entrepreneurs in the State. The activity are focused on the actual generation of entrepreneurs, already running a business, and simultaneously new entrepreneurs such as university students

(international and domestic) or foreign direct investors. Accordingly, different measures have been undertaken in order to support the local creation and proliferation of businesses.

Science, research, education and innovation go straight to the heart of the South Australian capacity to develop a sound business environment, which brings lasting benefits to the country. The government considers its excellence in science, research and innovation as a key factor to success in solving emerging challenges, with the long term goal to be a global leader in these fields. This requires a strong **cooperation between research institutions, industry and government** (*Triple Helix Model*) as already investigated within the South Australian environment by Serrao and Tortorici (2013). Moving the analysis to a *Fractal Innovation Ecosystem* there is a growing need for innovation networks and knowledge clusters to arise, in order to cope with the changing surrounding environment. The idea of a presence of a multi-level, multi-modal, multi-nodal and multi-agent system of systems points out clearly the importance of the relations among different entities in the ecosystem. Businesses, Universities, Research Centres and Government are strictly interconnected between each other, which obviously could create some issues, but at the same time give the possibility to exploit new opportunity for co-operation, co-opetition, co-evolution and co-specialization.

BOX 6: The South Australian Knowledge-based hubs: Tonsley and SAHMRI

Tonsley represents a clear example of a potentially successful strategy, which takes advantage of the spatial concentration of firms and academic facilities in order to produce cooperation, innovation, agglomeration economies and a good strength for R&D FDI attraction. This project, undertaken by the South Australian Government to foster vibrancy, innovation and international competitiveness, aims at creating a new industrial future in the State and Tonsley is the heart of it. Tonsley is a high-value manufacturing and knowledge-based industry hub, where manufacturing, research and training capabilities work in cooperation. Entrepreneurial businesses in mining, energy, construction, clean technology and health will find Tonsley to be an intelligent, integrated precinct providing access to South Australia's highly skilled and trained workforce. This is the outcome of the redevelopment of the former Mitsubishi Motors Australia Limited site until 2008, then acquired from the South Australian Government in 2010. It occupies an area around 64 hectares, placed 10km south of the Adelaide CBD.

The target sectors for the Tonsley redevelopment include, but are not limited to:

- Clean tech (renewable energy, water, environment and building technologies)
- Health and medical (medical devices, tele-health)
- Mining and resources (remote mining technologies, simulation)
- Functional food
- Instrumentation (rapid prototyping, integrated management systems)
- Process control and automation.

The focus on these sectors reflects the South Australian awareness that the development of an industry cluster will lead to a greatest prosperity for Tonsley investors, occupants, workers, and for the South Australian economy.

This synergistic cluster benefits from:

- South Australia's highly skilled and capable workers
- The presence of the Flinders University's school of Computer Science, Engineering and Mathematics and the New Venture Institute in the park
- TAFE SA's Sustainable Industries Education Centre (SIEC) with more than 8,000 students trained in sustainable building and construction occupations every year
- The presence of international high-tech company such as Siemens, with which the South Australian Government signed a Memorandum of Understanding (MOU) to become a strategic partner in the Tonsley project.

All these elements will foster prolific links between business, education and research, leading to knowledge and innovation production connecting to product commercialization through a variety of essential and strategic industries.

The South Australian Health and Medical Research Institute (SAHMRI) is the response to challenges facing the health and medical research and arise from the *Review of Health and Medical Research in South Australia*, which recommended the founding of a dedicated, flagship research institute for South Australia. Commissioned by the South Australian government in response to this recommendation in 2008, the Federal Government allocated $200 million to build the research facility. SAHMRI is a 25,000 sqm, iconic building, situated in the northern part of Adelaide's CBD and was officially opened in November 2013. It employs more than 600 outstanding researchers working together to develop more effective cures for some of the most challenging diseases. The project was founded by the South Australian Treasurer, the South Australian Minister of Health, the Department of Further Education, Employment, Science and Technology(DFEEST), the University of Adelaide, Flinders University and the University of South Australia, reaffirming the joint commitment, public and academic, for the development of science and technology in South Australia. SAHMRI represents an innovative model of cooperation, first time used in Australia, in which researchers from all South Australia's universities will work jointly on 7 research themes: Aboriginal Health; Cancer; Healthy Mothers, Babies and Children; Heart Health; Infection and Immunity; Mind and Brain; Nutrition Metabolism.

According to a report elaborated by Ernst and Young on the economic impact of SAHMRI, during the first seven years of operation, the projected return for the State would be AU$277 million but this is just the direct effect on the South Australian economy. In fact, as David Cochrane, Ernst and Young partner, affirms, a more complete calculation should consider all the social economic effects like the attraction of conventions to Adelaide, the attraction of new business, the commercialization of the research outcomes, the retention of talents in South Australia, the improvement of knowledge and community growth. Adding all these variables, they are likely to be worth even more than the direct economic contribution.
In addition, in the next five years SAHMRI will be fused with the New Royal Adelaide Hospital hosted in a new research building for medical research and training. In that way jointly they will be the largest health and

Science, research and innovation play a crucial role in achieving the goal of transforming South Australian economy by improving productivity and competitiveness, especially in some sectors: manufacturing, agriculture, mining, health, and many others. The rapid technological advances and the critical role of ICT are already raising employment opportunities in knowledge-based sectors and contributing by a considerable percentage of Australian GDP. Nonetheless, research centres and institutions are accelerating investment to keep and become increasingly competitive. Moreover, they are attempting to improve community understanding and support for science and research since it is essential to attract people into the many emerging career opportunities.
In doing so, there are seven key pillars[17] the government takes into account:

1. Investing in people, who represent current and future **research leaders**;
2. Investing in science, technology, engineering and maths skills to drive **innovation** and growth;
3. Investing in research to build strength points;
4. Industry **collaboration**, **entrepreneurship** and **commercialisation**;
5. Building strategic **international** partnerships;
6. Increasing wellbeing through publicly funded research;
7. Investing in strategic infrastructure.

The approach of a double "I" environment presented in this report, is already been implemented by South Australia to some extent. Region's priorities, as well the seven key

[17] Government of South Australia (2014). Investing in science: an action plan for prosperity through science, research and innovation. The Department of Further Education, Employment, Science and Technology, January 2014.

pillars, taken individually are already addressing aspects that belong to the innovation or internationalization sphere. The future challenge for the state is to address them as a unique issue, so that policies will be aligned completely in order to exploit synergies, and SA citizens will be able to benefit at most from the virtuous circle of local socio-economic development. In the following paragraphs, the different aspects of the environment based on innovation and internationalization will be analysed from the South Australian perspective.

5.2.1 INNOVATION IN SOUTH AUSTRALIA

The Knowledge Space in South Australia is highly developed and it is mainly based on its six universities:

- The University of Adelaide
- The Flinders University of South Australia
- The University of South Australia
- Carnegie Mellon University (US)
- University College London (UK)
- Torrens University Australia (US, Laureate International Universities network)

South Australia tends to be unlikely associated to innovation as the stereotype is still linked to the old concept strictly related to natural resources, especially the mining sector. Actually research and innovation is happening all around, affecting positively everyday lives. One might be surprised by knowing how much research from South Australia is making a difference. To improve the understanding of the links between tangible outcomes and life-changing impact of research and show a view of the university as a connected hub of ideas, one could look at some past successful examples. South Australia, in fact, has a long tradition of attracting and generating excellence in education and has been the home of six Nobel Prize laureates: Sir. William Henry Bragg (Physics), Prof. William Lawrence Bragg (Physics), Sir. Howard Walter Florey (Medicine), Prof. J. Robin Warren (Medicine) and Dr. J.M. Coetzee (Literature).

Together with those academic institutions, the education and research landscape of South Australia relies on a number of research centres, national and international, which are important stakeholders of the local innovation ecosystem. These research institutions are located in five key precincts:

- Mawson: focused on the Manufacturing, Mining, ICT, defence, automotive and electronics industries;
- Florey: medical sciences research and basic research capabilities;
- Flinders: marine and related research activities, biotechnology;
- Thebarton: bioscience;
- Waite: agribusiness, food and natural resources.

In detail, the national research centres present in South Australia are: four Federal Government's Cooperative Research Centres (CRC), the Commonwealth Scientific and

Industrial Research Centre (CSIRO) and the Defence Science and Technology Organisation (DSTO). These last two research institutions are of particular relevance in their respective fields. The CSIRO supports mostly agribusiness, natural resource management and manufacturing R&D. The DSTO is focused on research in the defence sector and is linked to the state's universities in attracting defence and related ICT companies to South Australia. Parallel to these major national Research Centres, South Australia hosts a number of other major research-intensive institutions engaged in R&D activities:

- The South Australian Health Medical Research Institute (SAHMRI), which is the South Australian flagship health and research institute;
- The South Australian Research and Development Institute (SARDI), which is the State Government's research institute specialising in agricultural, aquatic, environmental and biodiversity sciences;
- The Airborne Research Australian;
- The Australian Wine Research Institute (AWRI);
- The Australian Centre for Plant Functional Genomics (ACPFG), internationally well-known and recognised.

Cooperative Research Centres in South Australia

The CRC is a long term program, by the Australian Government, providing a bridge between industries, universities and other research institutes. The State Government invested A$1.2 million across ten Cooperative Research Centres generating more than A$30 million, and providing more than 220 companies with R&D services, employing around 265 people, and facilitating multilateral international collaboration (Canada, China, Germany, India, Japan, Spain, UK). In addition, technologies developed by the CRC will enable old industrial land to be developed creating substantial benefits by lowering cost (more savings), increasing decontaminated land values, and improved health outcomes.

South Australia is renowned for its innovation success fostered by some key factors: a strong research community, entrepreneurial businesses, significant creative communities, effective government, high levels of education and an ability to collaborate, all supported by dependable infrastructure and existing links to national and global markets. Investing in science, research and development can significantly impact on South Australia. Therefore it becomes essential to improve these capabilities, aiming to increase the research output and their quality. These can help to attract tertiary students and established scientists, providing also greater opportunities to local scientists and leading to an overall improvement of living and economic performance.

For this purpose, the South Australian Government established the ***Premier's Research and Industry Fund*** (PRIF), which is focused on the areas where the State can have the biggest impact in a local, national and international level.

Over the last 9 years, from its foundation in 2004, the PRIF has provided funds to researchers up to nearly AUD32 million. The grants awarded by PRIF are based on 5 funding programs:

1. **South Australian Research Fellowship Program:** The aim of this program is to "attract and retain world class researchers with leading-edge expertise to enhance the State's research capabilities." The number of South Australian Research Fellowships offered has increased to 2 per year, each worth up to $1 Million over four years.
2. **International Research Grants Program:** It supports "South Australian scientific and technological researches that are been undertaken with an international partner", encouraging cross-sector interaction to develop high quality, innovative and collaborative research activities. The recipients of the grants will be funded up to $100,000 yearly for a maximum of 4 years.
3. **Collaboration Pathways Program:** It supports "new research collaborations in development, or to assist existing research groups to leverage support". The recipients of the grants will be funded up to $500,000 yearly for a maximum of 4 years.
4. **Innovation Voucher Program:** Its aim is to stimulate SMEs to work with a research provider (technical research, design validation, prototype, and innovative production process development) in order to develop new manufactured products or systems, improving productivity and business performance.
   The recipients of the grants will be funded with a voucher between $10,000 to $50,000 on a competitive basis to collaborative projects designed to enhance the productivity or industry diversification of SMEs.
5. **Catalyst Research Grants Program:** it supports early career researchers working with industry and the wider community. The object of the research should target research activities relating to the State Government's seven strategic priorities. The grants will be awarded to a maximum of $30,000 for a term up to 2 years.

All the programs showed a discrete success rate in the last year, as showed in the table below (table 5.1).

TABLE 5.1: Summary of *Premier's Research and Industry Fund* Programs

Program	Grant (up to)	Years (up to)	No. of Applicant (2013)	No. of Grants Awarded (2013)	Success Rate (%)
South Australian Research Fellowship Program	$250,000	4	8	3	37,5%
International Research Grants Program	$100,000	4	15	5	33,33%
Collaboration Pathways Program	$500,000	4	23	6	26,08%
Innovation Voucher Program	$50,000	1	44	22	50%
Catalyst Research Grants Program	$30,000	2	32	10	31,25%

Source: http://www.statedevelopment.sa.gov.au/what-we-do/premiers-research-and-industry-fund and author's elaboration.

For the year 2014-15, the South Australian government has allocated $4.2 million to the Premier's Research and Industry Fund. In addition to this, an extra $2 million a year will be allocated to the Fund in order to expand the initiatives following the recommendation of the Premier's Science and Industry Council. A specific budget has been allocated to each program; however this is subject to change depending on the number of applications received.

Moreover, the Government particularly supports South Australian businesses to build this capacity in an ever changing global landscape. Programs supporting innovation include:

- BioInnovation Grants and Incubator;
- Business Model Innovation Series;
- Competitive Foods Initiative;
- EChallenge;
- Innovyz Start;
- Small Business Innovation Research (SBIR) Pilot Program.

Business Model Innovation Series

In the current high cost environment, innovation creates value for both the customer and the business. This program is designed to help manufacturers understand how to appropriate the value they create for customers. In fact, most firms are experienced in creating value through efficiency or technology, rather than determine how to capture the value they have created back to their business.
It was delivered by the Chair of the Advanced Manufacturing Council, Professor Göran Roos, in partnership with the Australian Industry Group, with the specific intent to help manufacturers learn how to embed innovation in their firm's business model.
The series is delivered over seven one-day modules, each approximately three weeks apart. Each course is limited to ten non-competing firms, and each business is expected to have three participants, including the Chief Executive.

ANZ Innovyz Start Program (Adelaide and Sidney)

The Innovyz START Institute runs the ANZ Innovyz START accelerator program and the ANZ Innovyz BRIDGE program. ANZ Innovyz BRIDGE was designed as a follow-on program for a select group of companies which have graduated from ANZ Innovyz START and have received investments and/or a large contract. The BRIDGE program extends 3-6 months after graduation and enables companies to cross the chasm between "startup" and "initial growth", the stage when so many companies fail. ANZ Innovyz START is a 13-week accelerator program looking for companies using web 2.0, software or mobile apps to deliver their break-through product or service. Three person teams are selected to be collocated in the accelerator. With the mentorship of experienced business leaders, the teams learn to grow their companies in the accelerator. Upon acceptance into the ANZ Innovyz START program, founders agree to share 8% equity with Innovyz START. ANZ Innovyz START accepts applications from both Australian and international companies. The final goal of this project is to foster the entrepreneurial ecosystem in Australia by empowering entrepreneurial CEOs and their teams with insights and skills suitable to commercialise innovation and rapidly scale their companies.

SBIR Pilot Program

This program is targeted to help small businesses develop products that can solve specific problems faced by some Government agencies. It assists companies to undertake research, develop solutions to meet Government agency's needs, and finally commercialise the solution more broadly. The program runs in two phases:
1. The first feasibility stage will last up to six months, with contracts awarded up to a maximum of $100,000 per company. At the end of this stage, contracted companies are expected to have developed their concept and demonstrated the feasibility of the technology.
2. Ideas funded in the first phase may be given a second stage contract aimed to product development. This phase covers more detailed R&D and, by the end, companies are expected to have a fully-functional prototype ready for commercialisation.

Adelaide Research and Innovation

The Government of South Australia means to increase commercialisation and innovation in order to build and improve the relationships between industry, research, education and markets. In fact, collaboration is crucial to commercialisation and innovation since it requires keen links between research and industry, understanding of market changes, and the ability to react to them. The future growth of the economy will especially depend on the new technologies, and SMEs that better know them. In line with this, the strategic plan of the Government of SA (*Investing in science: an action plan for prosperity through science, research and innovation.* January, 2014) is based on six focal points:

1. Align research within university towards local industry challenges;
2. Support industrial innovation by investing more in management capability and innovation clusters;
3. Support university research students to commercialise new ideas and gain industry-based experience;
4. Seek to lure more VC supporting commercialisation opportunities and research centres;
5. Enable greater release of government data to promote innovation;
6. Drive greater innovation within the Government.

ECIC in the University of Adelaide

The University of Adelaide is ranked among the top 1% of universities in the world. The University is also a member of the Group of Eight, constituting Australia's leading research-intensive universities. It is one of South Australia's largest employers providing 3,800 direct and 2,600 indirect jobs. Its research income is more than $155 million per year and contribution to the local economy is reported to be around $1.4 billion. Beyond the 4 campuses in Adelaide, there is also a satellite campus in Singapore, the Ngee Ann Adelaide Education Centre.

The Entrepreneurship Commercialisation and Innovation Centre's mission is to stimulate innovation through its research, teaching, and community engagement activities including the Australian eChallenge and ThIncLab Commercialisation Accelerator.

The Australian eChallenge has been stimulating Australian entrepreneurship since 2001. It is a student entrepreneurial competition based around the development and submission of a strategic business plan for an early-stage entrepreneurial venture. Teams compete for prizes and the prestige of being nominated the most outstanding Australian eChallenge entrepreneurial venture of the year. Moreover, each year a team from the Australian eChallenge is selected to participate in International competitions, such as the Global Venture Labs Investment Competition (Austin, Texas). The Australian eChallenge is made up of a teaching and learning environment including: specialised workshops conducted by field expertise; the opportunity to work supported by business mentorship; connection with members of the business and research community; and the opportunity to enrol in the eChallenge as a course. Many participants have developed successful businesses, proving that the Australian eChallenge can create true commercial perspectives helping South Australia to thrive.

The ThIncLab Commercialisation Accelerator promotes innovative and entrepreneurial postgraduate students of the University of Adelaide to unlock the commercial potential of research, business concepts or services. Specifically, it aims to help develop a strategic business plan. The program is delivered using a combination of non-traditional learning and teaching styles, including online training, face-to-face workshops with experienced industry and government professionals, hands-on support, mentoring, presentations, and business incubation support services.

Technology commercialisation: ITEK (University of South Australia)

ITEK Ventures Pty Ltd is the technology commercialisation company of the University of South Australia, which aims to facilitate the translation of research outcomes into products and services by creating a commercial return and getting a positive social impact. Its team consists of highly qualified professionals with experience in business development, intellectual property management, licensing, finance and law, aiming to bridge the gap between academia and business understanding. They offer different services, such as: commercialisation and legal advice; research collaboration and networks; intellectual property management; product licensing, company formation and capital raising.

ITEK leverages the needs of industry against the core capabilities and intellectual assets of the University of SA in order to create opportunities for industry to engage with it, and to secure commercial interest in innovative technologies that have commercial applications.

UniSA's focal research areas are: advanced manufacturing, health sciences, ICT, mining, and sustainable technologies.

New Venture Institute (Flinders University, Adelaide)

The New Venture institute (NVI) arises from the collaboration between the Flinders University Business School and Flinders Partners, the University's commercialisation arm. Starting in June 2013, its *aim is to connect Flinders University's staff, students and resources with external businesses, entrepreneurs, students and innovators to create and foster an entrepreneurial community in Adelaide.* NVI promotes entrepreneurship and supports high-growth businesses to positively affect South Australia by focusing the resources of Flinders University, with programs ranging from a co-working space for startups, entrepreneurship education, mentoring, and innovation management consultancy to a student internship program.

One important initiative is called Venture Dorm, which provides an educational environment for people who want to learn how entrepreneurs build new ventures. In less than 12 weeks the idea is to provide people with the right set of skills needed for nowadays business environment. Flinders University is recognizing that the traditional business teaching is unsuitable for new ventures, as the lack of real experience in bridging the gap between theory and practice is hindering future generations of entrepreneurs.

The eNVIsion Incubator is one of its latest initiative and provides space to teams of start-ups in order to get together and work on their businesses. It includes several features such as: Weekly pitch sessions, rotating mentors-in-residence, direct access to university resources and an eNVIsion concierge who plays an essential role connecting teams to the people and resources they need. The creation of this place is important for startups in order to have a

physical place where to work, but simultaneously can generate a cluster effect by putting together several startup teams with many different innovative ideas.

5.2.2 STRATEGIC INTERNATIONAL PARTNERSHIPS

As reported in "*An action plan for prosperity through science, research and innovation*" (Government of South Australia, 2014), the government is engaged to promote investment in SA building and improving strategic international partnerships, through international collaboration in R&D as a key driver. The strategy from the action plan above is planned by leveraging on three recommendations:

1. Promote university's research capabilities to attract investment and develop local industry;
2. Support collaborative research between domestic and international research institutes to address shared challenges and build and improve reputation;
3. Promote SA as a top destination for international students, given the Science Technology, Engineering and Mathematics (STEM) results.

For these purposes, the Government will establish a coordinating committee to facilitate international research and expand the International Research Grant Program included in the Premier's Research and Industry Fund to new global research links.

Studying in South Australia is rewarding: Adelaide is safe, sophisticated and a modern hub, characterized by a multicultural population of 1.2 million people. Adelaide's three long-established universities have been popular with international students for several years and are regularly highly placed on international rankings. One essential distinctive feature is represented by their international agreements, in particular for PhD programs.

Flinders University has formal exchange agreements with several universities in Asia, Europe, Scandinavia and the Americas that allow exchanging students for one or two semesters each year. The University of Adelaide's Study Abroad and Exchange programs allow students who are already enrolled at universities abroad to study in Adelaide for one or two semesters. The University of South Australia is modern, progressive and international. It provides a network of exchange partners well developed all over the world, ranging from Europe (11 different countries), Americas (3 different countries) and Asia (9 different countries).

Moreover, to reiterate in Adelaide are present some of the world's best universities, like Carnegie Mellon University from the US or the University College London from the United Kingdom.

TABLE 5.2: How many international students are there studying in South Australian Universities?

Adelaide / South Australia Universities	***Onshore International***	***Domestic***	***Total***	***International Proportion***
Flinders University	2,331	15,054	17,385	13.40%
The University of Adelaide	6,328	16,953	23,281	27.20%
University of South Australia	6,070	23,868	29,938	20.30%

Source: *http://www.australianuniversities.com.au/directory/student-numbers/*

INTERNATIONAL ENGAGEMENT

"*South Australia's future prosperity remains intrinsically linked to our ability to engage effectively in the highly competitive international arena*" (J.Weatherill).

South Australia wants to be recognised internationally as a globally engaged, dynamic regional centre, and a resource-rich and rewarding investment location, which offers an innovative and competitive business environment and values global partnership. The Premier's vision aims to attract entrepreneurs, scientific researchers and international students, and make people see South Australia as a destination of opportunity for migrants settling in Australia. In order to innovate and thrive, the South Australian Government should nurture international strategic partnerships providing mutual benefits through economic synergies, research and development collaboration, capacity development, or cultural enrichment targeting shared objectives.

The government of South Australia recognises innovation to be able to come from within and outside of the state, and is eager to learn and adapt from global best practice in areas that match with its strategic goals. For international engagement to be effective, communication and dynamic relationships results are pivotal.

Specifically, since its first introduction (2004), South Australia's Strategic Plan has been an ever-evolving project shaping the future by choice, and not by chance. It enables the State to move forward in a systematic way towards the goals it is expected to achieve by 2050. Most targets require access to international markets, or cooperative international partnerships.
In an increasingly and globally interdependent and competitive landscape, an external focus is essential to South Australia's social, economic and environmental sustainability, especially since some key sectors' growth can occur only through integration with global markets.
Thus Government is looking beyond its national borders in order to capture opportunities and maximise the state's capacity to keep the living standards high. Successful international engagement is considered critical to realise the full potential of the state.

Moreover, investment attraction is a major priority as new investment can be a catalyst for innovation, higher-value manufacturing and increased trade. Australia is well placed geographically to take advantage of the increasing developments of the Asian region and, in meanwhile, can even consolidate the developed and mature relationships with Europe and North America where, often through our shared history, language and culture, established partnerships keep supporting South Australia's growth and development.

Invest South Australia

South Australia has unprecedented opportunities for investment. “Invest South Australia” has been established to help investors discover these opportunities, with a team of experienced finance and corporate professionals, promoting South Australia's $100 billion development channel to the Australian and global investment community. Its networks in the state's business community, including with local project leaders, allow connecting to significant investment-ready opportunities, introducing to capital sources both from domestic and international markets. In particular, they provide investors with: information on key sectors of the South Australian economy; access to South Australian Government expertise in key sectors; links to South Australia's renowned case management team (to simplify dealings between government and investors in major projects); and access to South Australia's experienced professional services industry for local expertise.

Source: http://www.statedevelopment.sa.gov.au/what-we-do/invest-in-south-australia

ASEAN

Asia is reported to constitute the largest trading market for South Australia by ABS 2013 (65.3% of exports and 61.4% of imports). Specifically, ASEAN countries exports amount to 17.2% and 22.3% for imports. These trading ties have been underpinned by international engagement between South Australia and South East Asia, already existing for several years, and characterized not only by migration, cultural and education exchanges, but also by trade and investment. In fact, Australia-ASEAN cooperation was formalized in 1974. The South Australian Government works with the diverse stakeholders, such as community, business and industries, to strengthen the relationships in the region since the world’s economic focus point is moving toward it. In so doing, the Government of SA wants to look beyond the traditional partnership and secure long-term thriving. Its geographical proximity and historical links with South East Asia provide a unique advantage. An important commitment signal was sent through the government’s “New Colombo Plan”, aimed at developing closer international ties with Asia through educational scholarships and exchanges, with an initial focus in Singapore, Japan and Hong Kong, three of the most significant current investors in Australia. Recently, the 40th anniversary of the partnerships between Australia and ASEAN has represented a unique opportunity to launch new strategic directions. Free trade agreements are being continuously negotiated, like that one between Australia, New Zealand and ASEAN. Currently, another pivotal agreement is in progress, the Trans Pacific Partnership. Moreover, Australia has bilateral agreements in place with its important investors of the area, Singapore, Malaysia and Thailand.

South Australian industry and business organisations play an increasingly essential role in supporting commercial relationships with South East Asia through extensive networks and connections. This is clear looking at their trade relations. In particular, their most important export destinations, in this area, Malaysia, Indonesia, Vietnam, Thailand and Singapore. The latter one represents the largest two-way trading partner in the region.

South East Asia is an increasingly crucial source of investment and offers significant opportunities for South Australia. At present, Malaysia and Singapore are South Australia’s main sources of inward FDI from the South East Asia. The former one focuses on tourist accommodation, wine, food and agribusiness, shipping, airlines, real estate, utilities and telecommunications. The latter one invests mostly in tourist accommodation, airlines,

utilities, and agribusiness. Recently, investment from Thailand has been increasing as well, in tourist accommodation and energy sector above all.
In order to attract further its neighbour countries, the Government of South Australia has committed to improving the sectors reflecting its competitive advantages: defence, resources and energy, premium and food wine, health and biomedical industry, tourism, education, and creative industries. Its strategic plan is mainly aimed at deepening and broadening existing partnerships with Malaysia, Singapore and Indonesia, and redefining focus on Thailand.

Japan

The Australia–Japan partnership is the closest and most mature in the *Australasian* region, and is significantly important to both countries' strategic and economic interests.
Japan is Australia's second largest trading market (A$70.8 billion in 2013) and third largest source of foreign investment stock (A$63.3 billion in 2013). With specific regard to **South Australia**, it was the fourth largest for both export (5.8% share) and import market (8.5%), in 2012-2013 (Austrade, 2013).
Australia's stable political, business and investment environment makes it a critical supplier to Japan of clean and safe food products as well as minerals and energy. To further strengthen the economic relationship, Australian Prime Minister Abbott and Japanese Prime Minister Abe recently (8 July 2014) signed the Japan Australia Economic Partnership Agreement.

The development of the post-war Australia-Japan relationship can be deepened through three main phases: the establishment of a major trading relationship with Japan shortly after Second World War (Commerce Agreement, 1957); a process of broadening the (mostly cultural) relationship (NARA); and the emergence of a more complete partnership including on important political and security objectives (Joint Declaration on Security Cooperation, 2007; conclusion of negotiations on the JAEPA, 2014).

Looking at FDI flows (fDI Markets, 2013), Japan results the first largest source (31.16% overall) in Australia, and the third in **South Australia** (16.86%). Japanese investment in Australia has recently extended beyond the traditional areas of natural resources to diverse sectors such as financial services, infrastructure, information and communications technology, property, food and agribusiness. The JAEPA will boost Japan’s diverse and growing investment in Australia, generating employment growth including in regional Australia. Australian companies and individuals also target Japanese businesses for investment, and Japan is Australia's sixth largest destination for foreign investment. In 2013, Australia's stock of investment in Japan was A$$50 billion.

Australia and Japan are natural partners with highly complementary economies. The agreement will bring their economies and societies even closer and reinforce the already strong relationship. The agreement will deliver significant benefits to Australian farmers, manufacturers, exporters, service providers and consumers. More than 97% of Australia’s exports to Japan will receive preferential access or enter duty-free when JAEPA is fully implemented. Currently, JAEPA is by far the most liberalising trade agreement Japan has ever concluded.

India

A trade agreement between Australia and India would support to widen the base of merchandise trade by addressing tariff barriers and behind the border restrictions on trade in goods. There is significant potential to expand trade in services between these two countries. An FTA could facilitate growth in services trade by reducing barriers faced by Australian service suppliers and by increasing regulatory transparency. An FTA could facilitate and encourage investment by reducing barriers, increasing disclosure and improving investment protections. To this date, India is the tenth largest trading market (ABS, 2013).

South Australia, in particular, is well positioned in supporting India's growth and benefitting from it since it recognises it as the world's largest democracy and a thriving power. So these two countries have recently developed a strong partnership, based on culture, education and investment. In particular, South Australia's support is aimed at helping India to achieve its socio-economic goals by improving its own industrial power. The success of this relationship depends on local and international cooperation between government, education, industry, and the broader community. This engagement strategy, focuses on trade and investment (*South Australia – India engagement strategy,* July 2014. The Government of South Australia, Department of State Development). There are increasing opportunities for India to invest, especially in mining, well supported by the exported goods, expertise and services generated by the partnership. India's rapid urbanisation is expected to attract FDI and further opportunities in South Australia. Furthermore, engagement with the Indian diaspora may be crucial to affect its governmental policy. Since South Australia has the potential to achieve strong and sustained growth, it can support India's fast growth as a knowledge-based economy by sharing expertise, resources and services. As a result, India is the second largest FDI (flow) source (19.70 % overall), according to fDI Markets data (2013), and the fourth largest trading market (third for exports).

China

As already investigated by the report of Meng and Cerini (August 2014), South Australia and China enjoy a mutually beneficial and prosperous relationship. China is South Australia's largest two-way trade partner, with its exports including a range of mineral resources, unpackaged agricultural commodities and wine. China represents the fifth largest FDI (flow) source both for Australia and South Australia (fDI Markets, 2013). In particular, South Australia is attracting Chinese investment in the resources sector, the wine industry and property. The largest proportion of overseas students coming into South Australia is from China, and the Chinese business migrant community in South Australia is growing and flourishing, bringing investment and jobs. However, South Australia has a 26-year sister-state relationship with Shandong province, the third largest provincial economy in China and, in November 2013, Qingdao has become the Friendly Cooperative sister city of Adelaide.

South Australia's rich natural resources, high education level institutions, lower cost of living, and sound environment are highly attractive to the Chinese market.

Yet, South Australia lacks brand presence and the sheer scale of the Chinese market presents many challenges for South Australian businesses. Accordingly, the Government of South

Australia has developed a specific Chinese Engagement Strategy in order to boost the cooperative relationship, and different kinds of activities are currently underway.

South Australia has the potential to achieve strong, sustained growth, due largely to the strength of a suite of major projects led by, but not confined to, those in resources and energy and defence. The opportunity is to leverage resource projects to develop local value chains in areas such as high-value manufacturing and services, and other knowledge-intensive activities. This requires an active stance in relation to its industry participation policy, and the development of local capacity and capability.

China's growth provides South Australia with significant opportunities, particularly for the manufacturing and service industries. South Australia also has a good opportunity to develop well-connected and internationally recognised commercial centres of intellectual and technical excellence, focused on problem solving within the State and the Asian region. International partners would accelerate the diffusion and application of knowledge in the local economy of both sides and help build international recognition for their capabilities and competitive strengths. Opportunities exist to deepen research collaboration with Chinese entities on common problems and challenges, leveraging existing and future South Australian research strengths.

The Government of South Australia (*South Australia – China Engagement Strategy,* July 2014) has identified the following strategy:

- Focusing within and between government and industry in order to ensure engagement with China relating to strengths and capabilities;
- Understanding how China is changing and respond effectively to that;
- Helping Australia's businesses become '"China ready" identifying and securing opportunities from its growth and development;
- Strengthening government, business, social and cultural ties to underpin mutual economic benefits from the relationship with China.

Moreover, in the meantime, South Australian delegations have recently visited China to deliberate future collaboration opportunities. The South Australia-Shandong Cooperation and Development Forum, and its *High Level Working Group* was founded in April 2013. Food and wine promotional events were held in Hong Kong, Jinan and Qingdao. A joint venture agreement was signed between Basetec Services and Shandong Sinoma Jinling. China-Australia Centre for Health Sciences, which is a joint research and education centre between the University of of South Australia and Shandong University, was opened in 2013. In 2012 the Zhendong Australia-China Centre for Molecular Traditional Chinese Medicine was established in Adelaide, a partnership between the University of Adelaide, the Shanxi College of Traditional Chinese Medicine and Zhendong Pharmaceutical Company to uncover how traditional Chinese medicine affects the human body in an effort to integrate it with Western medicine.

EUROPE

In 2013, European countries held Australian FDI stocks to a value of A$163.8 billion (around 26%) over top 20 source countries. In fact, Europe is a particular important strategic and economic partner for Australia. Among the first twenty countries to invest (FDI stock) in Australia, eight are from Europe, according to the ABS statistics (2013). Some European

countries have already established specific relationships with **South Australia**. In fact, Europe already held 12.1% of exports and 17.5% of imports of South Australia in 2013. The key sectors, for the State, are Health and Biomedicine, Agribusiness, Natural Resources, Gold, Petroleum, Solar and Wind Energy. South Australia's most relevant exports towards the European countries are Natural Resources, especially Oil and Oil seed. In addition, as most of them are exporters of pharmaceutical products and medicine equipment to Australia, they represent a high potential source of products and expertise to the South Australian Health and Medical Research Institute. Focusing more on European Union, from 5 to 9 April 2014, EU Economic and Commercial Counsellors undertook a mission targeted to understand more about the South Australian economy, trade and investment opportunities for EU businesses. From this visit a final report was published highlighting the main opportunities of cooperation.

United Kingdom and Australia have an extensive economic and trade relationship. The UK is Australia's 7th largest two-way trading partner for goods and services trade, their 9th largest export market and our 7th largest source of imports. The UK is also their leading European trade partner as well as in South Australia (globally 9th). In addition, the UK is Australia's second most important foreign investment destination, and the fourth largest FDI source in South Australia. Minerals represent Australia's leading export, but its wine industry is an increasingly relevant sector in trade with the UK, the second most valuable wine export destination. Australian wine has been the market leader in the UK for a decade, which could represent an important opportunity for South Australia in order to better penetrate this market. Finally, some recent growth areas include premium fruit, meat and organic produce.

The importance of continental Europe for Australia and SA is undeniable. Perhaps the most important country could be **Germany.** It shares strong ties in innovation and research as shown by more than 300 partnerships and cooperation agreements between their universities and research institutes. In particular, Germany is Australia's third most important research partner. In fact, it is ranked among the top partner countries for CSIRO[18]'s international engagement including several collaboration areas, such as ICT, food safety technology and food processing, solar technology, materials science and engineering, crop science, science education programs or radio astronomy and aerospace research.

Germany innovation and research strategies are based on the differentiation by quality, and sustainability, and is aimed to invest wherever there is genuine excellence in these areas. Thus, the Australian Government is encouraging the internationalization of research and industrial collaboration by the German "Mittelstand", the engine room of the German economy, opening to the opportunity of targeting and attracting new investment. ABS data indicates also that Germany was the 9th largest FDI stock in Australia in 2013.

With specific regard to South Australia, statistics show Germany to be the 7th largest FDI flow source (fDI Markets, 2013) and the 15th (2nd in Europe) trading market (Austrade, 2013).

Other important relations with European countries could be found in **Switzerland,** in the **Benelux area** and Italy. The first one is a relevant investor in Australia as reported by ABS statistics: it was the 7th largest FDI stock source in Australia in 2013. With specific regard to South Australia, statistics reported Switzerland to be the 9th most important FDI flow source (fDI Markets, 2013). The Netherlands represent an important investment and trade partner

[18] The Commonwealth Scientific and Industrial Research Organisation is Australia's national science agency and one of the largest and most diverse research agencies in the world.

for Australia. In particular, the Netherlands look to be its relevant FDI stock source, given their fourth spot (A$29.4 billion) in ABS rankings (2013), and are also the second largest export market from Europe (third for South Australia). Recently (February 2014), the two countries have defined a closer economic and strategic relationship, within a joint foreign ministers' meeting in Canberra. They have been sharing common views on major foreign and trade issues so much that they have decided to work more closely to solve them, in particular, through increasing export and trade channels above all. Australia has traditionally kept a strong investment engagement with Belgium too. The Belgium-Luxembourg Economic Union (BLEU) is one of Australia's largest investors with AUD7.8 billion of FDI stock (ABS 2013). In addition, Belgium is the 20th world's largest trading market, and the fourth in Europe, with regards to SA (Austrade, 2013).

Italy has constantly provided both inspiration and leadership to the process of European integration through some of the most prominent figures of its political and cultural life and through a pro-European sentiment which is strongly integrated in its civil society and which has constantly been reflected in very high turnout rates at the European elections (65% in 2009, against an average of 43% for the 27 Member States). Italy is actively engaged in major substantive issues of both the internal and external EU agenda.

Italy's strengths are in its SMEs and their evolution (dimension and capitalization). Opposed to the idea of a "scale revolution", that is not only impossible in Italy, but would destroy the capabilities, the flexibility and the talents that have made the "Made in Italy" brand so prominent around the world. Italian SMEs give a sound economic contribution and guarantee Italian prominence in World Export. 5 million enterprises that employ 90% of the Italian work force (15.8m employees) belong to that category. These companies are known for their niche specialization and the quality and reliability of their products. Their value-add is equal to 70% of the total, their exports are equal to round 70% of total internationalization and their export propensity is higher than Germany.

The Government of **South Australia** has established various activities of cooperation with Italian Regions mainly based on scientific research and technology transfer. These initiatives fit well into regional strategic plans allowing promoting universities on a mutual basis, research centres, and high-tech companies to share mutual priority areas.

Since 2008 the SA Government has jointly funded scientific/technological projects (in the fields of agro-food, remote-sensing, water, transport, nanomaterials, photonic, biosensors) and international workshops. Three high-tech joint ventures between SMEs from the two countries have been set up. The Office of International Engagement (DPC) has also hosted 27 interns from Italian Universities (Bocconi-Milan, Trento and PoliTo (3 month internships)). This strategy has won strong support from the State's higher education and research sector, as collaboration between SA institutions and international partners has been fundamental in opening up additional opportunities for scientific, higher education and commercial application – particularly as EU funding is not directly open to Australian scientists.

NORTH AMERICA

The South Australian Strategic Plan includes, as a priority, strengthening their mature relationships with North America where the established partnerships keep underpinning the

State's growth and development, especially thanks the shared history, language and culture characterizing them.

Australia and **Canada** grant each other preferential tariff rates on a limited range of products agreed under the CANATA since 1960 (revised in 1973). As CANATA pre-dates the multilateral trading system, most of its provisions have been outdated by tariff reductions achieved by WTO. Australia and Canada are both participating in the negotiations for the TPP free trade agreement. Austrade has offices in Toronto and Vancouver aimed at pursuing Australia's trade and investment priorities. There are important investment ties between Australia and Canada thanks to the Canadian stable investment environment. More than 80 Australian companies operate in Canada, and Canada mostly invests in resources and manufacturing.

Canada will host the next Australia-Canada Economic Leadership Forum in mid-2015, an exercise in 'private sector diplomacy' including business, academia and other non-government players in order to contribute to the development of the bilateral relationship. Moreover, Canada results the eighth most important investor (FDI stock) in Australia (ABS 2013), as well as the eighth largest FDI flow source in South Australia.

The **United States** is the world's largest economy, one of the major drivers of the global economy, and a world leader in terms of international trade and investment, R&D expenditure, stock market capitalisation and share of large global corporations. Although the US applies foreign investment restrictions in some sectors of the economy, foreign investors are, in general, treated equally with respect to domestic business. There are no restrictions on moving capital in or out of the US or on the repatriation of profits. A protocol amending the double taxation convention for Australia and the US entered into force on July 2003 in order to improve International Tax Compliance and to implement the Foreign Account Tax Compliance Act (in force from June 2014).

The US is Australia's most important economic partner country, considering both goods and services trade, as well as investment stock. It is the largest two-way investment partner of Australia and the second for South Australia (9.5% of exports, 11.3% of imports). In particular, it is the second largest FDI flow source in Australia (after Japan), amounting to 16.21% overall, and the largest one in South Australia by 20.31% overall (fDI Markets, 2013). In addition, it is the most important FDI stock source (ABS, 2013).

With the Australia-United States Free Trade Agreement (2005), more than 97% of Australia's non-agricultural exports to the US (excluding textiles and clothing) became duty free and two-thirds of agricultural tariff lines went to zero. Under AUSFTA, for the first time, Australian companies have access to the federal government procurement market in the US and the government procurement markets of 31 US states. This has raised bilateral trade by around one third. In particular, the agreement involves different industries and sectors, creating several benefits:

- The removal of duties on most non-agricultural exports from Australia;
- Improved access for Australian agriculture;
- Introduction of full access for a range of Australian goods and services;
- Better legal protection and fair treatment for Australian service providers.

Australia and the US have a record of working together closely to promote global trade liberalisation for over 50 years, worked closely in establishing the G20, and together in global and regional trade and economic forum, including the WTO and the APEC forum. They are also negotiating the TPP agreement.

5.3 BioSA INITIATIVE OF SOUTH AUSTRALIAN GOVERNMENT

The most relevant initiative in South Australia, which implements the approach of a double 'I' environment and could be analysed as a best practice, is **BioSA**. It is a business accelerator growing high-tech industry focusing on job creation, business startups and bringing local, **innovative** products and technologies to local and **international markets**. Indeed, it strongly targets innovation and internationalization and seeks only partners who aim to market globally as it sees internationalization as the key to innovation and business development. The organisation has significantly affected the bioscience sector, yielding company and job growth, increase in exports and attraction of investment capital over the last 13 years.

BioSA is a public corporation and a Subsidiary of the Minister for Science and Information Economy with a direct line of reporting. It receives annual funding from the South Australian Government of around A$5.5 million. BioSA is a Government initiative, differing from Government departments since it has more degrees of freedom in risk management and strategic authority. That has allowed it to be outward looking and industry engaging and deliver high impact industry assistance.

This initiative is not based on mere guidelines, but on concretely helping entrepreneurs better understands their business, what they need and how they can be supported, by means of money, facilities, networks and business development strategies. Thanks to a successful strategy of provision of grants, management expertise, access to capital and infrastructure; BioSA has facilitated the creation of 75 bioscience companies in South Australia, bringing the total number in SA to over 100. BioSA's strategy key features can be grouped into three broad areas:

1. business development assistance and establishing effective networks;
2. providing access to capital and finance;
3. growing the physical infrastructure available to the industry.

1. As already said before BioSA is not only providing access to finance, but also infrastructure and knowledge. Helping the new business to evolve and develop is fundamental, as already written in this report, most startups fail due to business model failure or premature scaling. Here is where there is a need for a support to business development in terms of management skills and effective networks. This value-add has made the most difference to the industry over the past decade. BioSA evaluates about 40 new technologies a year and on average provides grants to about 10 or 12, and between two and four new companies are formed each year through its various initiatives. The premature scaling to the USA is a phenomenon well recognized, and an appropriate networking effort could help businesses to scale up through Europe first, and then move globally. Other times the support to the

possible business development can start even before, with a program such as the IP fund, where BioSA created a $1 million Intellectual Property Fund (IP Fund) in order to assist university inventors/researchers in their early stages and fight the decreasing tendency in applying for IP protection. The results after its introduction (2011) are remarkable with the three local universities that together reach almost three times patent applications.

2. Access to financial resources has been stressed many times as a crucial factor for SMEs and startups within the report. BioSA is managing a grant program (at early stages of business development) for high-growth businesses, with investments that range from $10,000 to $250,000 through state government funds. On average, over the past five years, for every $1 provided in a BioSA grant, firms were able to attract an additional $3 from private investment capital, to generate $4 in sales and to attract $5 through external grants. BioSA grants became repayable in 2012, so when a company successfully commercializes its products or services, BioSA enjoys some financial flows back at a negotiated rate. Over 12 years of activity, the grants program has provided $35 million in grants to more than 80 companies and has attracted ten times leverage. The companies involved develop, manufacture and/or sell innovative products and services from Adelaide to interstate and world markets. They vary from companies producing a wrist watch to detect the symptoms of low blood sugar levels in diabetics to others producing batteries combining high power and large capacity. Some successful stories include:

In order to be complete, BioSA facilitated the creation of a venture fund management company (used by companies in the market-entry phase). Terra Rossa Capital (TRC) was established in 2006 and even though it shares the location with BioSA, it operates in a complete independent way. Over the years TRC was able to raise up to $20 million in private investment capital, and invested in 11 companies mostly in South Australia. Eight out of the 11 TRC investee companies had previously secured a BioSA grant, demonstrating the value of a strong working relationship between TRC and BioSA. Up to now TRC is the only venture capital fund of its type in the state. Its investment of about $20 million of superannuation money has leveraged an additional $65 million in private co-investment and approximately $15 million in Federal Government grants.

3. In order to grow the physical infrastructure available to the industry and simultaneously create a cluster for innovation and internationalization excellence, BioSA established its two

business incubators. They are located in the high-tech precinct of Thebarton, close to the north-west side of the vibrant capital of South Australia: Adelaide. It allows for sharing of resources between companies, collective learning and exchange of experiences, and often includes exchanging staff. Companies lease space from BioSA (sophisticated laboratories and offices accordingly to their needs) and they share board rooms and amenities. Companies remain in a business incubator for up to five years. By that time, they have either outgrown the space and must move on, or the business is not going as well as anticipated and their lease is not renewed by BioSA. Being part of BioSA's incubation program generates mainly two effects, which are high business retention and the increase in the likelihood of business success. International research on the effectiveness of business incubation has demonstrated that 84% of companies graduating stay in the local community for at least five years, while 87% of incubator graduates stay in business for more than five years. There are over 800 technical incubator buildings in the world, and South Australia is leading this initiative in Australia. It is well established that investment in business incubators provides the highest return on any government investment when it comes to job creation. In fact, a Grant Thornton report demonstrated that incubators provide up to 20 times more jobs than community infrastructure projects like water, roads, bridges and ports. Its first business incubator building, 'BioSA incubator', was financed by the South Australian Government and opened by the Premier in 2008. It was fully leased prior to opening and has been at capacity ever since. BioSA was not been able to obtain further government funding for an additional building, 'Tech Hub', which instead was acquired and customised through private finance. The new building, operational since late March 2014, is also over 90% leased and together with the first building are going to welcome soon the 200th employee. High-tech advanced manufacturing industries are the key to diversifying South Australia's economy, and business incubation is the key factor to build these industries. In doing so, by supporting emerging innovative companies, BioSA is guaranteeing future employment and attracting investment to South Australia.

BioSA's industry sector is growing fast and has growth constraints, which the South Australian Government can easily address, concerning the high-tech space and startup business, which are expected to be the future of the South Australian economy. BioSA has been acting both as a virtual and physical business incubator and following international best practice in business assistance. In doing so, it also plays a crucial role in supporting the innovation ecosystem. Such ecosystem is strongly based on a solid background of R&D, and in the funding process of that research, BioSA plays a crucial role. It bridges the gap between the early stages of research which is often supported by the government and universities, and the last stages where the product must be marketed and commercialised by securing private funding. The BioSA initiative is the only one dedicated to that purpose, and shows how a small government organisation can sharply affect industry development, link industry with research and foster a vibrant startup ecosystem.

CONCLUDING REMARKS

"It is clear that there is a link between innovation and internationalization: firms need to innovate in order to be able to compete in foreign markets: on the other hand internationalization may lead to innovation as a result of so called 'learning-by export/internationalization' effects" (Meng and Cerini, 2014).

Following this conclusion from Meng and Cerini in a past DPC report (August, 2014), here are highlighted considerations and data in order to understand the current trends of innovation and internationalization within the global landscape, including a specific regard on South Australia. Nowadays, the true challenge, for policy makers as well as for business leaders, is to create a sound and competitive business environment in order to enable firms of all sizes to well-perform. This environment is suggested to be based on a double 'I' approach where Internationalization and Innovation are handled together in order to extract the best from all the possible synergies. The interconnection of the two aspects is receiving more and more attention by scholars and pundits nowadays, as the simultaneous systematic approach of the issues from a policy maker perspective will generate a virtuous cycle of socio-economic development. Under this double 'I' environment approach, the SMEs and MNCs present different features, performance and opportunities:

- The SMEs represent a factor of balance at the micro and macroeconomic level. The underlying idea is that SMEs are complementary with MNCs, but have a higher impact in terms of jobs creation. Especially those SMEs that are engaging high-tech innovative activities. Two thirds of the newly created jobs are owed to this sector since the creation costs associated to new jobs are relatively lower. However, there are a number of barriers that may hinder the entrepreneurship culture and the creation of rapid growth innovative and international SMEs, and hence impede the ability of economies to achieve full employment and economic growth. The main challenges are: an appropriate regulatory framework, access to finance, access to market and innovation and entrepreneurship promotion. Policy makers of all OECD countries are involved in setting-up the appropriate actions and policies to understand the business environment conditions that a new entrepreneur will have to face in the creation process of a new firm. Particular attention is needed for the Startups sector, which is receiving growing interest worldwide as a new source of innovation, internationalization and local economic development.

- MNCs are predominant in certain industries strongly led by marketing and technology, and employ the most advanced techniques in their own respective fields thanks to a large amount of resources available. In terms of Innovation (R&D), those companies resulted to be the most investing ones, with the global top 10 MNCs (such as Volkswagen, Samsung, Microsoft, Novartis, etc.) investing more than € 70 billion each year all around the world (USA, EU, South-East Asia, Japan, etc.). Their international role, in fact, is increasing since their investments are often seen as engines for growth and development of the host economy. The linkage between MNCs and FDI is so close that the motivation for the latter feature may be employed

to distinguish between MNCs and other firms. Generally those firms are attracted by large and growing economies with stable political conditions, and entail relevant policy implications and structural changes from social and economic perspectives. Thus, even if the problems observed with SMEs are overcome by nature, MNCs still need an enabling environment in order to be attracted.

Implementing a double "I" environment approach is something that has been already addressed by the South Australian Government. SA's ten economic priorities aimed at improving the regional innovation and R&D competitiveness, enhancing high-value industries, and strengthening connections among University, Industry and Government (*Helix/Fractal Models*). A good example is the Tonsley redevelopment, where MNCs like Siemens, and high innovative SMEs are clustering together in order to leverage on interconnections and strengthen their networks.

Governmental policies and efforts are directed towards the two aspects of the environment even if some space for improvement, in terms of alignment, exists. Some local best practice like BioSA, could be used as a prototype of a double 'I' environment approach organization. Other possible future areas of interest where a double 'I' approach could present some remarkable results are:

- Investments in Science and broadly speaking in scientific research, leveraging on the actual base of research centres and strengthening its international network of cooperation. Furthermore, to make it profitable, that research needs to be aligned with companies in the best performing sectors in the economy.
- Engagement of future generations of young entrepreneurs starting from university. Entrepreneurial culture is a fundamental aspect of the double 'I' environment and acts as the solid base on which building the future of the region. A long term perspective is needed in order to not fall into generational trap as have other countries (such as Canada[19]). Looking at world recognized best practice in terms of startups' and companies' creation during the university studies, could represent a possible solution in order to catch up with world innovation leaders' countries, develop home students' talent and attract the brightest international ones.
- Addressing the SMEs in order to overcome the barriers presented in the report and enhances the potential for innovation and internationalization. The possibility of Joint Ventures (JV) with international partners in order to import/export high level knowledge could prove to be a turning strategy for the state economy.

All these aspects will indirectly affect MNCs as well, as by creating a vibrant international ecosystem for innovation; the region will be able to attract more FDI to intensive knowledge sectors.

The Double 'I' environment approach receives further importance in the light of the new Australian Government *"Industry Innovation and Competitiveness Agenda: an action plan for*

[19] http://research.cibcwm.com/economic_public/download/if-20121113.pdf

a stronger Australia" (October 2014). Improving competitiveness is necessary in order to sustain and improve the living standards of all Australians and in doing so the Federal Government is refocusing its priorities, revitalising Australia's business and entrepreneurial drive, to prevent Australia's economy from drifting. Through this Competitiveness Agenda, the Government aims to achieve four main ambitions relating to:

- Business Environment
- Labour Force
- Infrastructure
- Industry Policy

With regard to the *Business Environment,* the Government will make it easier and more cost effective to do business through a set of actions designed to reduce the burden of regulation and taxation and improve access to international markets, in order to enhance domestic and international competition.
Concerning the second ambition, the *Labour Force*, the Government is committed to enhance the skills of the Australian labour force by improving Australia's education and training system, attracting the most talented to Australia, returning the workplace relations systems to the sensible centre and helping parents stay in the workforce.
The third ambition is the Government's commitment to increase public investment and foster greater private investment in *Infrastructure,* and improving infrastructure project selection, funding, financing and delivery.
Finally, the Government is refocusing the *Industry Policy* to support innovation and entrepreneurship. Industry policies will be retargeted to leverage on Australia's strength and speed up the growth prospects of their high potential SME and most promising sectors. The Government will foster winning strategies by businesses that spend their own money and take their own risks. The Government is also committed to better translating Australia's good ideas into commercial success.

Clearly, this action plan seems to embed the Double 'I' environment approach. Firstly, the importance to make it easier and cost effective to do business in Australia, second the idea to increase the skills of the Australian workforce, third to increase public investment and encouraging greater private investment in infrastructure and finally the ambition to refocus the industry policy in order to drive innovation and entrepreneurship.
Some of these 'elements' have been extensively stressed throughout the whole report as together they aim at building a more competitive Australian environment, able to attract international partners to co-invest in the country. This approach is crucial to improve a local vibrant ecosystem able to enhance the competitiveness of the country, which in turn is able to attract national and international partners to invest locally due to the attractive power of the Double 'I' environment in which they will have the possibility to operate.

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ANNEX

Annex 1 – International Organizations

OECD

OECD is an organization whose cooperation is based on the commitment to democracy and market economy, by providing more opportunities to compare policy experiences, answering mutual problems, identify good practices and coordinate domestic and international policies of its members.

The OECD aims to solve economic, environmental, and social issues, by acting from peer pressure to improve policy and implement non-binding instruments that can occasionally lead to binding treaties. For this purpose, it cooperates with businesses, trade unions and other representatives of civil society. For instance, collaboration with the OECD, regarding taxation, has fostered the growth of a global web of bilateral tax treaties.

The OECD policies aim to: achieve high sustainable economic growth and employment and a rising standard of living while maintaining financial stability, and thus to contribute to the development of the world economy; and contribute to the expansion of world trade on a multilateral, non-discriminatory basis. Among the objectives, there is also the economic thriving of both member and non-member countries. As a result, 25 non-members participate as regular observers or full participants in OECD Committees, and about 50 non-members are engaged in OECD working parties, schemes or programmes. The OECD explores the possibilities for enhanced co-operation with selected countries and regions of strategic interest to the OECD, giving priority to South East Asia.

United Nations

The UN is an intergovernmental organization promoting international cooperation, and it is based on five main organs: the General Assembly, the Security Council, the Economic and Social Council, the Secretariat, and the International Court of Justice. The UN Charter asserts that each of its primary organs can establish various specialized agencies to accomplish its duties. Among the most renowned agencies, there are the FAO, ILO, UNESCO, UNHCR, UNIDO, the World Bank, and the WHO.

UNCTAD

The United Nations Conference on Trade And Development is the main organ of the UN General Assembly dealing with trade, investment, and development issues. The goals of this organization are the maximization of trade, investment and development opportunities within the developing countries, and the support in their efforts to integrate into the world economy. Specifically, the primary objective is to formulate policies concerning every aspect of development including trade, aid, transport, finance and technology.

The UNCTAD grew from the view that existing institutions such as IMF, WB, and WTO were not suitably organized to deal with the particular issues of developing countries.

WTO

The WTO is a rules-based, member-driven organization, that is, all decisions are made by the member governments, and the rules are the outcomes of negotiations among members. It aims to supervise and liberalize international trade. In particular, the WTO deals with trade

regulations of member countries by providing a framework for negotiating and formalizing trade agreements. Its main functions are to oversee the implementation, administration and operation of the covered agreements, and provide a forum for negotiations and for settling disputes. Moreover, it is WTO's duty to review and propagate the national trade policies, and to ensure the coherence and transparency of trade policies through surveillance in global economic policy-making, as well as its priority to assist developing, least-developed and low-income countries in transition to adjust to WTO rules and disciplines through technical cooperation and training.

APEC

Asia-Pacific Economic Cooperation is an agreement rather than an organization, but it is equally influential at an international level. It was established in 1989 in response to the growing interdependence of Asia-Pacific economies and the regional trade blocks developing in other parts of the world. APEC works to raise living standards and education levels through sustainable economic growth and to nurture a sense of community and an appreciation of shared interests among member countries. Members amount roughly to 40% of the world's population, nearly 54% of the world's gross domestic product and about 44% of world trade.

APEC is characterized by three main economic pillars: trade and Investment liberalisation, business facilitation, and economic and technical cooperation.

When APEC was established (1989), the region’s average trade barriers stood at 16.9%, but was reduced to 5.5% in 2004.

As far as business facilitation is concerning, between 2002 and 2006, the costs of business transactions across the region was reduced by 6%, thanks to the APEC Trade Facilitation Action Plan (TFAP). Then, between 2007 and 2010, a new Trade Facilitation Action Plan has been endorsed.

With specific regards to free trade, it is important to highlight the proposal for a Free Trade Area of the Asia-Pacific (FTAAP). It would create a free trade zone that would considerably expand commerce and economic growth in the region. The economic expansion and growth in trade could exceed the expectations of other regional free trade areas such as the ASEAN plus Three (ASEAN + China, Japan, and South Korea). However, the development of the FTAAP is expected to take many years, and would involve fundamental studies, assessment and negotiations between members.

IMF

The IMF's goal was to support the reconstruction of the world's international payment system post the Second World War. Countries contribute funds to a pool through a quota system from which countries with payment imbalances can temporarily borrow money and other resources. Through this fund, and other activities such as surveillance of its members' economies and the demand for self-correcting policies, the IMF works to improve the economies of participating countries.

The IMF is self-defined as an organization working to foster global monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and reduce poverty around the world. The following are its main objectives: to promote international economic co-operation, international trade,

employment, and exchange-rate stability, including by making financial resources available to member countries to meet balance of payments needs.

WB

The World Bank is a UN international financial institution (MDB) that provides loans to developing countries for capital programs. The World Bank is a component of both the World Bank Group and the United Nations Development Group. Its official goal is to reduce poverty. Its decisions must be guided by commitment to promote foreign investment and international trade and to facilitate capital investment.

Annex 2 – Global Innovation Index 2014 Rankings

Country/Economies	Score (0-100)	Rank	Income	Rank	Region	Rank	Eff. Ratio	Rank
Switzerland	64.78	**1**	HI	**1**	EUR	**1**	0.95	6
United Kingdom	62.37	2	HI	2	EUR	2	0.83	29
Sweden	62.29	3	HI	3	EUR	3	0.85	22
Finland	60.67	4	HI	4	EUR	4	0.80	41
Netherlands	60.59	5	HI	5	EUR	5	0.91	10
United States (USA)	60.09	6	HI	6	NAC	**1**	0.77	57
Singapore	59.24	7	HI	7	SEAO	**1**	0.61	110
Denmark	57.52	8	HI	8	EUR	6	0.76	61
Luxembourg	56.86	9	HI	9	EUR	7	0.93	9
Hong Kong (China)	56.82	10	HI	10	SEAO	2	0.66	99
Ireland	56.67	11	HI	11	EUR	8	0.79	47
Canada	56.13	12	HI	12	NAC	2	0.69	86
Germany	56.02	13	HI	13	EUR	9	0.86	19
Norway	55.59	14	HI	14	EUR	10	0.78	51
Israel	55.46	15	HI	15	NAWA	**1**	0.79	42
Korea, Republic of	55.27	16	HI	16	SEAO	3	0.78	54
Australia	55.01	17	HI	17	SEAO	4	0.70	81
New Zealand	54.52	18	HI	18	SEAO	5	0.75	66
Iceland	54.05	19	HI	19	EUR	11	0.90	13
Austria	53.41	20	HI	20	EUR	12	0.74	69
Japan	52.41	21	HI	21	SEAO	6	0.69	88
France	52.18	22	HI	22	EUR	13	0.75	64
Belgium	51.69	23	HI	23	EUR	14	0.78	55
Estonia	51.54	24	HI	24	EUR	15	0.81	34
Malta	50.44	25	HI	25	EUR	16	0.99	3
Czech Republic	50.22	26	HI	26	EUR	17	0.87	18
Spain	49.27	27	HI	27	EUR	18	0.76	60
Slovenia	47.23	28	HI	28	EUR	19	0.78	53
China	46.57	29	UM	**1**	SEAO	7	1.03	2
Cyprus	45.82	30	HI	29	NAWA	2	0.77	56
Italy	45.65	31	HI	30	EUR	20	0.78	52
Portugal	45.63	32	HI	31	EUR	21	0.74	73
Malaysia	45.60	33	UM	2	SEAO	8	0.74	72
Latvia	44.81	34	HI	32	EUR	22	0.82	32
Hungary	44.61	35	UM	3	EUR	23	0.90	15
United Arab Emirates	43.25	36	HI	33	NAWA	3	0.54	127
Slovakia	41.89	37	HI	34	EUR	24	0.79	45
Saudi Arabia	41.61	38	HI	35	NAWA	4	0.74	70
Lithuania	41.00	39	HI	36	EUR	25	0.68	89
Mauritius	40.94	40	UM	4	SSF	**1**	0.75	65
Barbados	40.78	41	HI	37	LCN	**1**	0.69	87
Croatia	40.75	42	HI	38	EUR	26	0.81	36
Moldova, Republic of	40.74	43	LM	**1**	EUR	27	1.07	**1**
Bulgaria	40.74	44	UM	5	EUR	28	0.84	25
Poland	40.64	45	HI	39	EUR	29	0.72	76
Chile	40.64	46	HI	40	LCN	2	0.68	92
Qatar	40.31	47	HI	41	NAWA	5	0.60	114
Thailand	39.28	48	UM	6	SEAO	9	0.76	62
Russian Federation	39.14	49	HI	42	EUR	30	0.79	49
Greece	38.95	50	HI	43	EUR	31	0.70	85
Seychelles	38.56	51	UM	7	SSF	2	0.74	74
Panama	38.30	52	UM	8	LCN	3	0.85	20
South Africa	38.25	53	UM	9	SSF	3	0.68	93
Turkey	38.20	54	UM	10	NAWA	6	0.93	11
Romania	38.08	55	UM	11	EUR	32	0.84	24
Mongolia	37.52	56	LM	2	SEAO	10	0.68	94
Costa Rica	37.30	57	UM	12	LCN	4	0.81	38
Belarus	37.10	58	UM	13	EUR	33	0.83	27

Montenegro	37.01	59	UM	14	EUR	34	0.62	106
TFYR of Macedonia	36.93	60	UM	15	EUR	35	0.70	82
Brazil	36.29	61	UM	16	LCN	5	0.74	71
Bahrain	36.26	62	HI	44	NAWA	7	0.60	117
Ukraine	36.26	63	LM	3	EUR	36	0.90	14
Jordan	36.21	64	UM	17	NAWA	8	0.80	40
Armenia	36.06	65	LM	4	NAWA	9	0.83	28
Mexico	36.02	66	UM	18	LCN	6	0.71	79
Serbia	35.89	67	UM	19	EUR	37	0.79	46
Colombia	35.50	68	UM	20	LCN	7	0.63	102
Kuwait	35.19	69	HI	45	NAWA	10	0.78	50
Argentina	35.13	70	UM	21	LCN	8	0.79	43
Viet Nam	34.89	71	LM	5	SEAO	11	0.95	5
Uruguay	34.76	72	HI	46	LCN	9	0.73	75
Peru	34.73	73	UM	22	LCN	10	0.62	107
Georgia	34.53	74	LM	6	NAWA	11	0.68	90
Oman	33.87	75	HI	47	NAWA	12	0.58	121
India	33.70	76	LM	7	CSA	**1**	0.82	31
Lebanon	33.60	77	UM	23	NAWA	13	0.59	119
Tunisia	32.94	78	UM	24	NAWA	14	0.66	98
Kazakhstan	32.75	79	UM	25	CSA	2	0.59	118
Guyana	32.48	80	LM	8	LCN	11	0.74	68
Bosnia and Herzegovina	32.43	81	UM	26	EUR	38	0.65	101
Jamaica	32.41	82	UM	27	LCN	12	0.65	100
Dominican Republic	32.29	83	UM	28	LCN	13	0.85	21
Morocco	32.24	84	LM	9	NAWA	15	0.70	83
Kenya	31.85	85	LI	**1**	SSF	4	0.84	26
Bhutan	31.83	86	LM	10	CSA	3	0.60	112
Indonesia	31.81	87	LM	11	SEAO	12	0.96	4
Brunei Darussalam	31.67	88	HI	48	SEAO	13	0.43	139
Paraguay	31.59	89	LM	12	LCN	14	0.75	63
Trinidad and Tobago	31.56	90	HI	49	LCN	15	0.63	103
Uganda	31.14	91	LI	2	SSF	5	0.71	77
Botswana	30.87	92	UM	29	SSF	6	0.50	133
Guatemala	30.75	93	LM	13	LCN	16	0.68	95
Albania	30.47	94	UM	30	EUR	39	0.50	131
Fiji	30.39	95	UM	31	SEAO	14	0.34	141
Ghana	30.26	96	LM	14	SSF	7	0.81	37
Cabo Verde	30.09	97	LM	15	SSF	8	0.55	126
Senegal	30.06	98	LM	16	SSF	9	0.85	23
Egypt	30.03	99	LM	17	NAWA	16	0.76	59
Philippines	29.87	100	LM	18	SEAO	15	0.81	35
Azerbaijan	29.60	101	UM	32	NAWA	17	0.58	120
Rwanda	29.31	102	LI	3	SSF	10	0.46	137
El Salvador	29.08	103	LM	19	LCN	17	0.60	116
Gambia	29.03	104	LI	4	SSF	11	0.76	58
Sri Lanka	29.98	105	LM	20	CSA	4	0.87	17
Cambodia	28.66	106	LI	5	SEAO	16	0.74	67
Mozambique	28.52	107	LI	6	SSF	12	0.57	124
Namibia	28.47	108	UM	33	SSF	13	0.55	125
Burkina Faso	28.18	109	LI	7	SSF	14	0.71	78
Nigeria	27.79	110	LM	21	SSF	15	0.94	8
Bolivia, Plurinational State	27.76	111	LM	22	LCN	18	0.70	84
Kyrgyzstan	27.75	112	LI	8	CSA	5	0.46	136
Malawi	27.61	113	LI	9	SSF	16	0.67	96
Cameroon	27.52	114	LM	23	SSF	17	0.80	39
Ecuador	27.50	115	UM	34	LCN	19	0.63	104
Cote d'Ivoire	27.02	116	LM	24	SSF	18	0.93	10
Lesotho	27.01	117	LM	25	SSF	19	0.40	140
Honduras	26.73	118	LM	26	LCN	20	0.53	128
Mali	26.18	119	LI	10	SSF	20	0.83	30

Iran, Islamic Republic of	26.14	120	UM	35	CSA	6	0.57	122
Zambia	25.76	121	LM	27	SSF	21	0.79	44
Venezuela, Bolivarian Republic	25.66	122	UM	36	LCN	21	0.95	7
Tanzania, United Republic of	25.60	123	LI	11	SSF	22	0.60	113
Madagascar	25.50	124	LI	12	SSF	23	0.62	105
Nicaragua	25.47	125	LM	28	LCN	22	0.53	129
Ethiopia	25.36	126	LI	13	SSF	24	0.67	97
Swaziland	25.33	127	LM	29	SSF	25	0.57	123
Uzbekistan	25.20	128	LM	30	CSA	7	0.61	108
Bangladesh	24.35	129	LI	14	CSA	8	0.68	91
Zimbabwe	24.31	130	LI	15	SSF	26	0.79	48
Niger	24.27	131	LI	16	SSF	27	0.50	132
Benin	24.21	132	LI	17	SSF	28	0.60	115
Algeria	24.20	133	UM	37	NAWA	18	0.53	130
Pakistan	24.00	134	LM	31	CSA	9	0.89	16
Angola	23.82	135	UM	38	SSF	29	0.82	33
Nepal	23.79	136	LI	18	CSA	10	0.49	134
Tajikistan	23.73	137	LI	19	CSA	11	0.45	138
Burundi	22.43	138	LI	20	SSF	30	0.46	135
Guinea	20.25	139	LI	21	SSF	31	0.61	109
Myanmar	19.64	140	LI	22	SEAO	17	0.71	80
Yemen	19.53	141	LM	32	NAWA	19	0.60	11
Togo	17.65	142	LI	23	SSF	32	0.25	142
Sudan	12.66	143	LM	33	SSF	33	0.09	143

NOTE: World Bank Income Group Classification (July 2013): LI = low income; LM = lower-middle income; UM = upper-middle income; and HI = high income. Regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa.

Annex 3 – Australia GII Profile

Key indicators

Population (millions)	22.7
GDP (US$ billions)	1,505.3
GDP per capita, PPP$	43,073.1
Income group	High income
Region	South East Asia and Oceania

		Score (0–100) or value (hard data)	Rank	
Global Innovation Index (out of 143)		**55.0**	**17**	
Innovation Output Sub-Index		45.5	22	
Innovation Input Sub-Index		64.6	10	
Innovation Efficiency Ratio		0.7	81	○
Global Innovation Index 2013 (out of 142)		53.1	19	
1	**Institutions**	**88.9**	**11**	
1.1	Political environment	86.3	14	
1.1.1	Political stability*	90.1	19	
1.1.2	Government effectiveness*	83.9	12	
1.1.3	Press freedom*	84.8	24	
1.2	Regulatory environment	93.7	12	
1.2.1	Regulatory quality*	95.0	7	●
1.2.2	Rule of law*	94.4	12	
1.2.3	Cost of redundancy dismissal, salary weeks	11.7	49	
1.3	Business environment	86.9	12	
1.3.1	Ease of starting a business*	95.9	9	●
1.3.2	Ease of resolving insolvency*	86.1	17	
1.3.3	Ease of paying taxes*	78.7	38	
2	**Human capital & research**	**61.8**	**7**	●
2.1	Education	55.5	24	
2.1.1	Expenditure on education, % GDP	5.6	43	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	19.9	59	○
2.1.3	School life expectancy, years	19.9	1	●
2.1.4	PISA scales in reading, maths, & science	512.5	14	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	59.9	7	●
2.2.1	Tertiary enrolment, % gross	83.2	7	●
2.2.2	Graduates in science & engineering, %	16.6	73	○
2.2.3	Tertiary inbound mobility, %	19.8	1	●
2.3	Research & development (R&D)	70.2	8	●
2.3.1	Researchers, headcounts/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	2.4	13	
2.3.3	QS university ranking, average score top 3*	85.8	5	●
3	**Infrastructure**	**60.1**	**7**	●
3.1	Information & communication technologies (ICTs)	78.4	9	●
3.1.1	ICT access*	76.4	21	
3.1.2	ICT use*	74.6	8	●
3.1.3	Government's online service*	86.3	9	
3.1.4	E-participation*	76.3	8	
3.2	General infrastructure	55.0	9	●
3.2.1	Electricity output, kWh/cap	10,929.8	10	
3.2.2	Logistics performance*	84.1	18	
3.2.3	Gross capital formation, % GDP	28.5	26	
3.3	Ecological sustainability	46.8	37	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.1	66	○
3.3.2	Environmental performance*	82.4	3	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.1	47	
4	**Market sophistication**	**68.1**	**10**	
4.1	Credit	66.8	11	
4.1.1	Ease of getting credit*	93.8	3	
4.1.2	Domestic credit to private sector, % GDP	123.3	22	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	50.4	29	
4.2.1	Ease of protecting investors*	56.7	55	○
4.2.2	Market capitalization, % GDP	84.6	20	
4.2.3	Total value of stocks traded, % GDP	69.2	10	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	23	
4.3	Trade & competition	86.9	1	●
4.3.1	Applied tariff rate, weighted mean, %	1.8	45	
4.3.2	Non-agricultural mkt access weighted tariff, %	0.6	56	
4.3.3	Intensity of local competition†	80.3	11	
5	**Business sophistication**	**43.9**	**26**	
5.1	Knowledge workers	63.0	22	
5.1.1	Knowledge-intensive employment, %	42.9	16	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % GDP	1.3	16	
5.1.4	GERD financed by business, %	58.4	23	
5.1.5	GMAT test takers/mn pop. 20–34	159.6	31	
5.2	Innovation linkages	38.4	48	
5.2.1	University/industry research collaboration†	67.7	14	
5.2.2	State of cluster development†	54.5	34	
5.2.3	GERD financed by abroad, %	1.6	76	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.1	27	
5.2.5	Patent families filed in 3+ offices/bn PPP$ GDP	1.0	20	
5.3	Knowledge absorption	30.3	42	
5.3.1	Royalty & license fees payments, % total trade	1.3	14	
5.3.2	High-tech imports less re-imports, %	10.1	28	
5.3.3	Comm., computer & info. services imp., % total trade	0.6	86	○
5.3.4	FDI net inflows, % GDP	4.8	42	
6	**Knowledge & technology outputs**	**38.5**	**31**	
6.1	Knowledge creation	36.6	26	
6.1.1	Domestic resident patent app./tr PPP$ GDP	2.7	40	
6.1.2	PCT resident patent app./tr PPP$ GDP	1.8	26	
6.1.3	Domestic res utility model app./tr PPP$ GDP	1.3	26	
6.1.4	Scientific & technical articles/bn PPP$ GDP	48.0	12	
6.1.5	Citable documents H index	514.0	10	
6.2	Knowledge impact	48.4	34	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.6	41	
6.2.2	New businesses/th pop. 15–64	12.2	8	
6.2.3	Computer software spending, % GDP	0.3	31	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	9.6	49	
6.2.5	High- & medium-high-tech manufactures, %	20.2	54	○
6.3	Knowledge diffusion	30.4	78	○
6.3.1	Royalty & license fees receipts, % total trade	0.3	32	
6.3.2	High-tech exports less re-exports, %	1.7	56	
6.3.3	Comm., computer & info. services exp., % total trade	0.9	87	○
6.3.4	FDI net outflows, % GDP	0.9	49	
7	**Creative outputs**	**52.5**	**12**	
7.1	Intangible assets	49.4	45	
7.1.1	Domestic res trademark app./bn PPP$ GDP	73.4	32	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.1	28	
7.1.3	ICTs & business model creation†	69.2	21	
7.1.4	ICTs & organizational model creation†	65.7	20	
7.2	Creative goods & services	42.4	12	
7.2.1	Cultural & creative services exports, % total trade	0.1	64	○
7.2.2	National feature films/mn pop. 15–69	2.6	49	○
7.2.3	Global ent. & media output/th pop. 15–69	2.3	3	●
7.2.4	Printing & publishing manufactures, %	0.1	5	●
7.2.5	Creative goods exports, % total trade	0.6	52	
7.3	Online creativity	68.6	10	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	83.6	10	
7.3.2	Country-code TLDs/th pop. 15–69	68.9	14	
7.3.3	Wikipedia edits/pop. 15–69	20,276.2	25	
7.3.4	Video uploads on YouTube/pop. 15–69	87.6	13	

NOTE: ● indicates a strength; ○ a weakness; * an index; † a survey question.

Source: Global Innovation Index 2014.