



Impact revealed

The power of intangible capital and how it affects GDP

Nordic Summit on Universities for Impact
Norwegian University of Science and Technology (NTNU)
Trondheim, June 8th 2016

Prof. Pirjo Ståhle

Intangible Capital



**Financial and
physical assets**

*Education and capacity
of people*

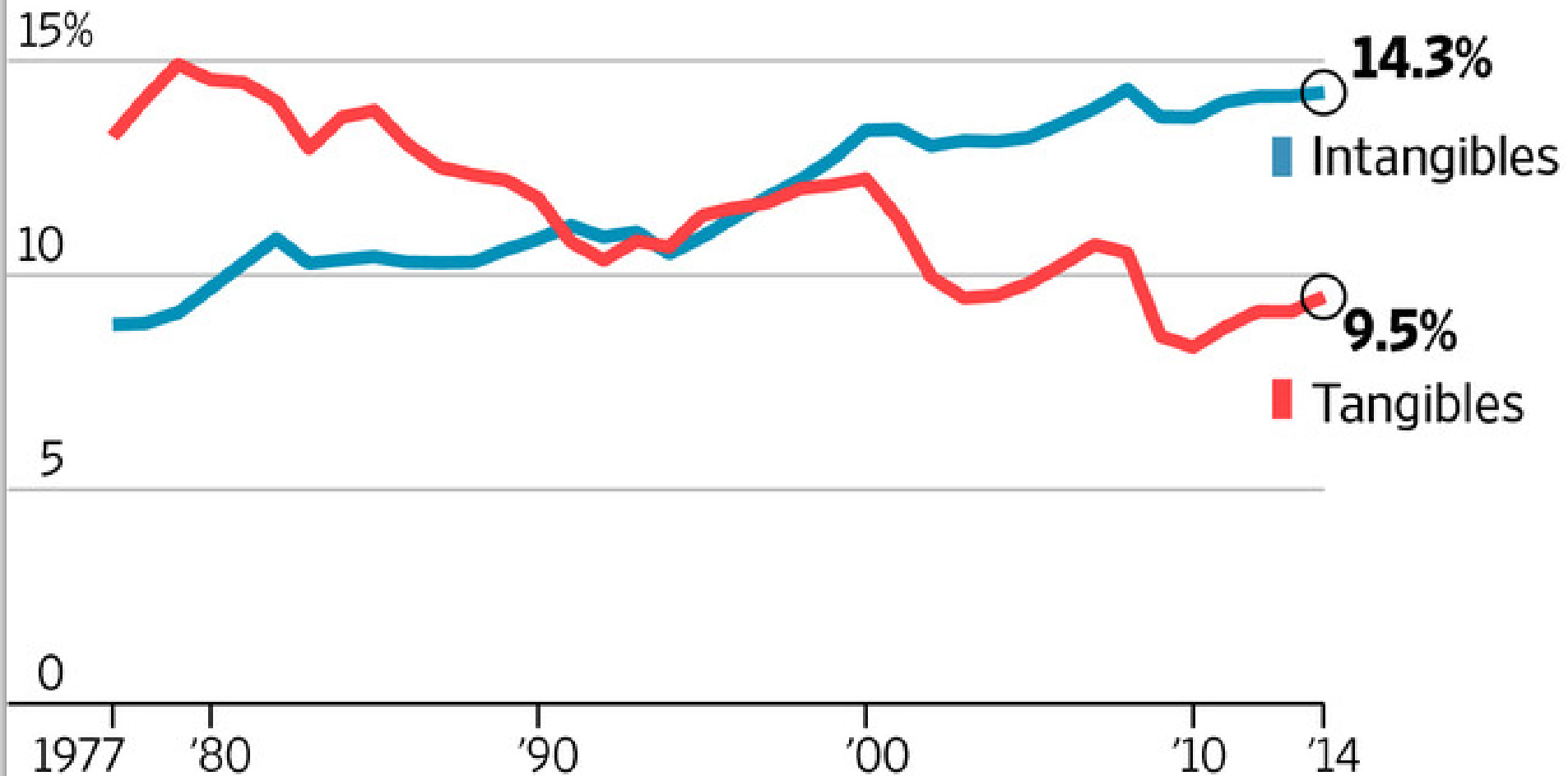
*Societal and technological
functions and structures*

*Business attraction and
brands*

*Knowledge creation and
innovativeness*

Intangible Investment

Investment rates in assets, as a percentage of private-sector GDP

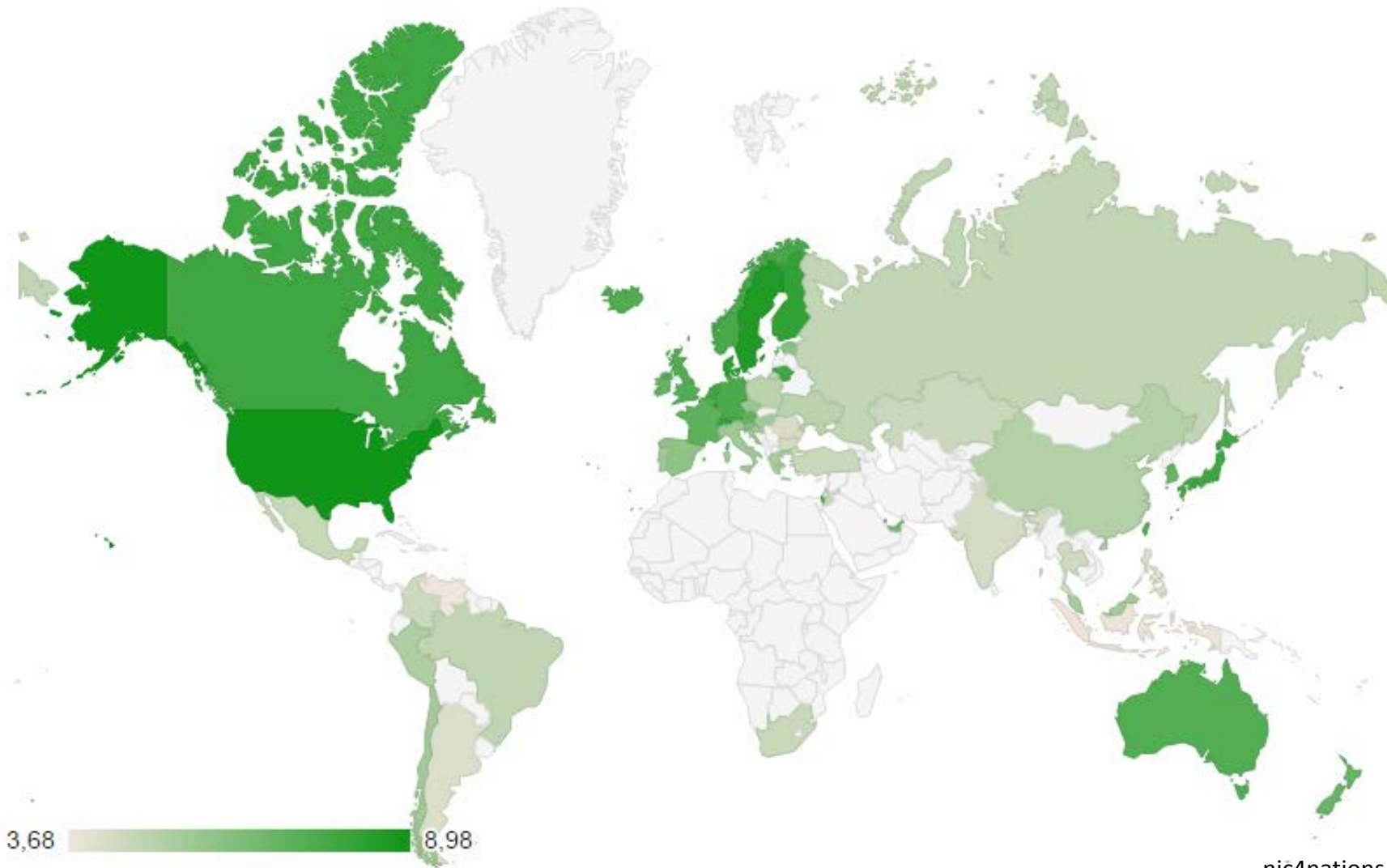


Source: Carol Corrado and Charles Hulten

THE WALL STREET JOURNAL.

National Intangible Capital in the World

2014

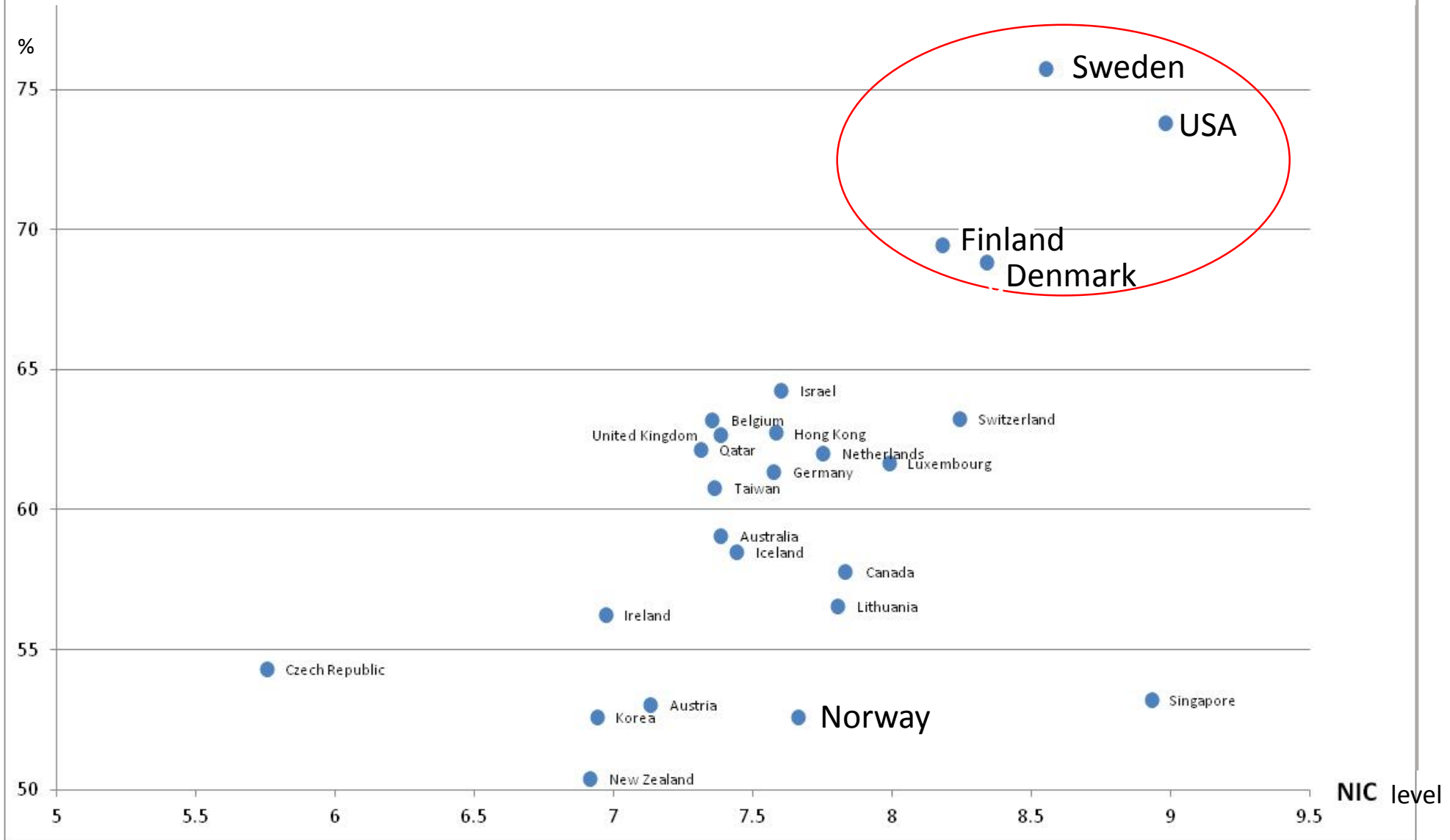


Ståhle, P., Ståhle, S., & Lin, C. 2015. Intangibles and national economic wealth – a new perspective on how they are linked. *Journal of Intellectual Capital*, Vol. 16 Iss: 1, pp. <http://www.emeraldinsight.com/doi/abs/10.1108/JIC-02-2014-0017>

National Intangible Capital: NIC level and its economic impact

2014

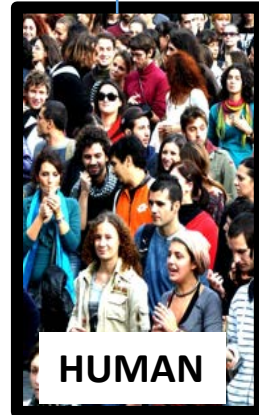
NIC impact on GDP



Based on the methodology exposed in Stähle, P., Stähle, S., & Lin, C. 2015. Intangibles and national economic wealth – a new perspective on how they are linked. *Journal of Intellectual Capital*, Vol. 16 Iss: 1, pp. -<http://www.emeraldinsight.com/doi/abs/10.1108/JIC-02-2014-0017>

National Intangible Capital

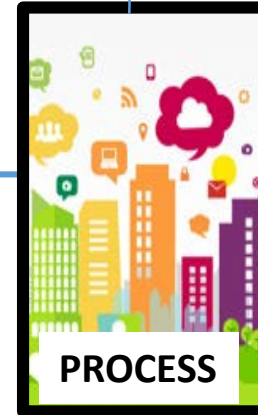
Driver for Economic Growth



Education
and capacity
of people



Business
attraction and
trust



Societal and
technological
functionality



Innovation
and knowledge
creation

National Intangible Capital

Human Capital

- Skilled labor*
- Employee training*
- Higher education achievement
- Pupil-teacher ratio
- Public expenditure on education
- 15-64 years old population
- Qualified engineers*
- Students' PISA performance
- Human Development Index
- Gender equality
- Years of education
- R&D researchers

Market Capital

- Corporate tax encouragement*
- Cross border venture*
- Openness of culture*
- Transparency of government policies*
- Image of the country*
- Capital availability*
- Trade to GDP ratio (exports + imports)
- Current account balance %GDP
- Investment flows %GDP
- Country credit rating
- Investment risk
- Globalization index

Process capital

- Business competition environment*
- Government efficiency*
- Computer per capita + Mobile subscribers
- Internet subscribers + Broadband subscribers
- Convenience of establishing new firms + start up days*
- Goods & services distribution efficiency*
- Overall productivity
- Unemployment % and youth unemployment %
- Consumer price inflation
- Health & environment
- Corruption
- Freedom of speech

Business R&D spending

Basic research*

R&D spending/GDP

R&D US\$ per capita

IP right protection*

Utility Patents/ R&D expenditure

Cooperation between corporations and university*

Scientific articles

Patents per capita (USTPO+EPO)

Entrepreneurship*

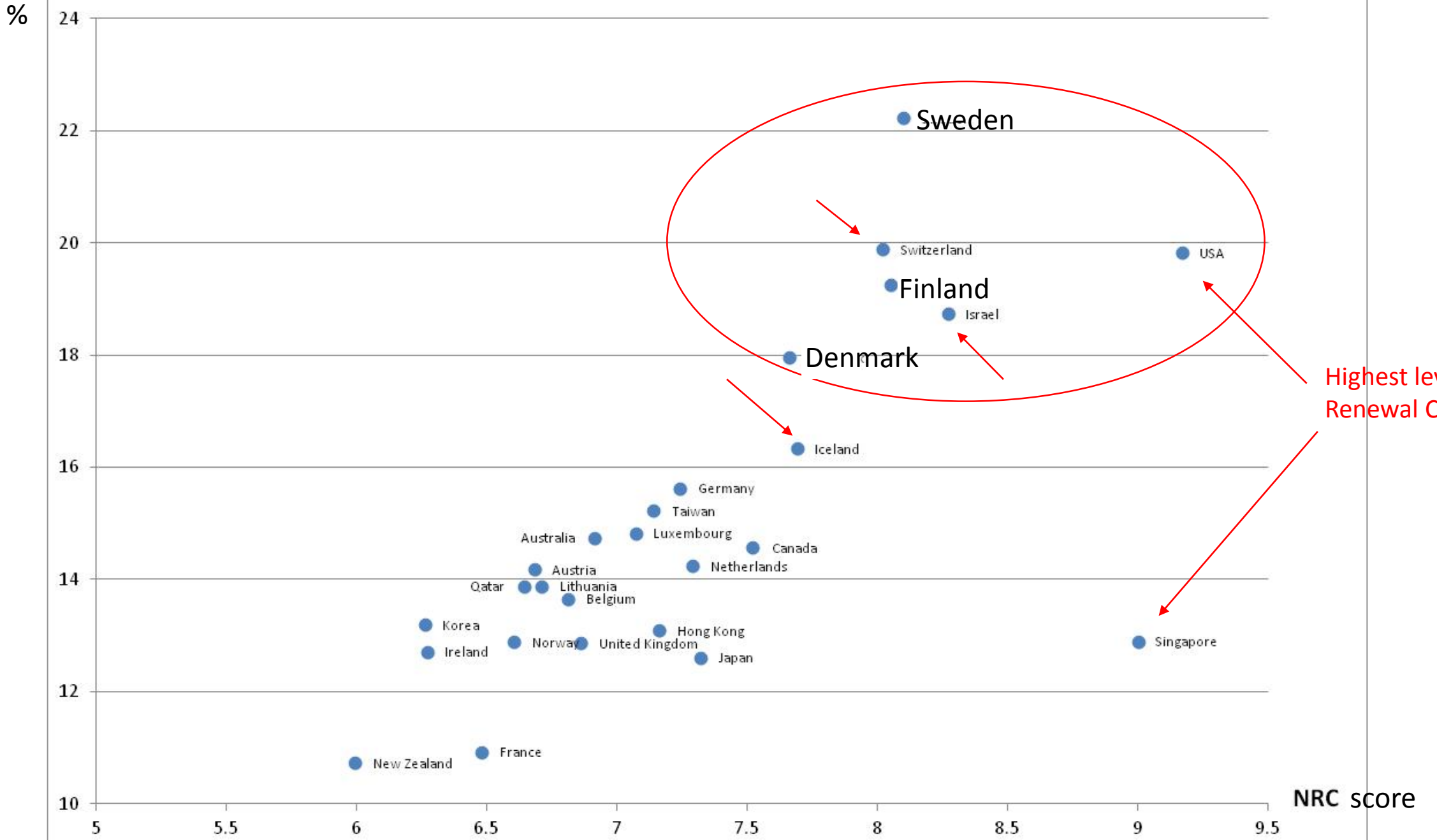
Development & application of technology*

Venture capital*

Based on the methodology exposed in Stähle, P., Stähle, S., & Lin, C. 2015. Intangibles and national economic wealth – a new perspective on how they are linked. *Journal of Intellectual Capital*, Vol. 16 Iss: 1, pp. -<http://www.emeraldinsight.com/doi/abs/10.1108/JIC-02-2014-0017>

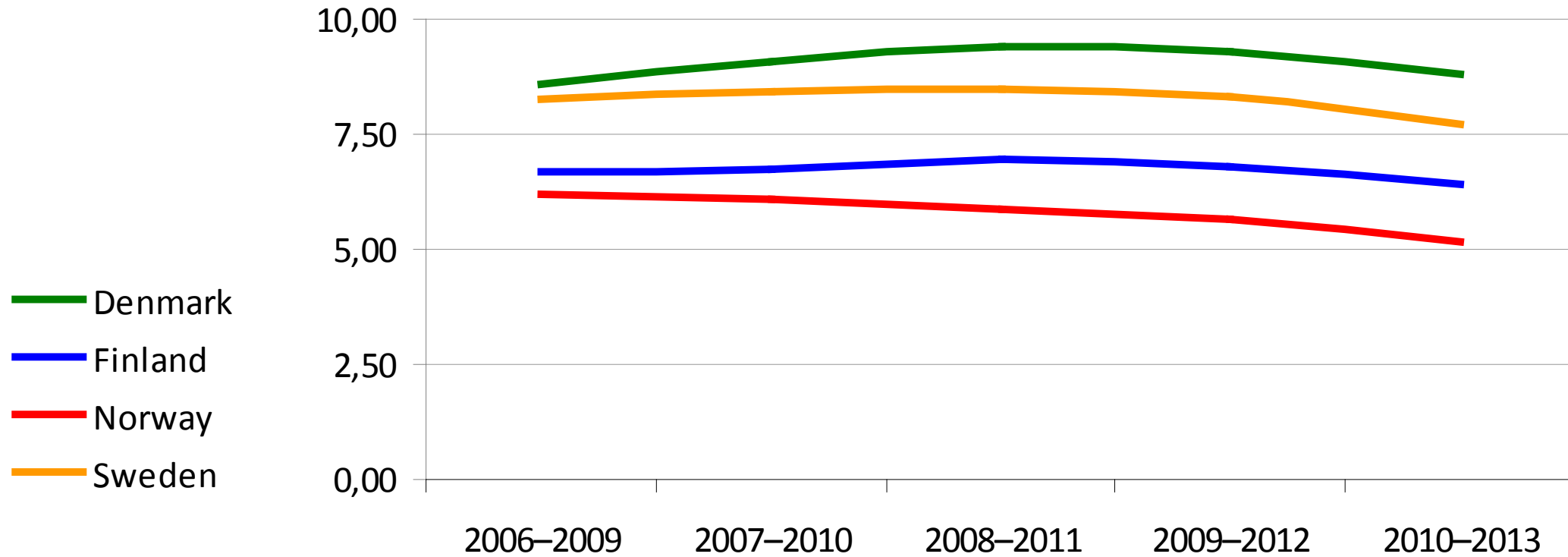
Countries where the impact of **Renewal Capital** on GDP is high

2014



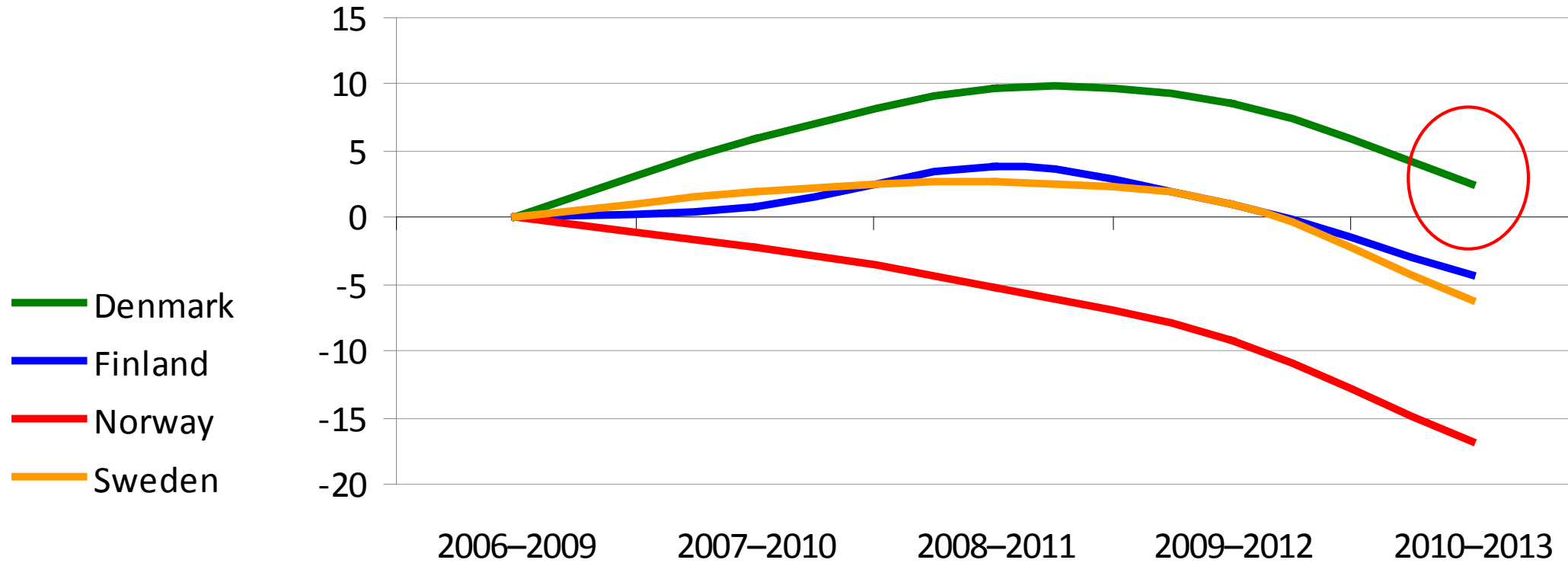
Highest level of Renewal Capital

University-Industry collaboration / Percentage share of projects



Source: CWTS / Centre for Science and Technology Studies / Leiden Ranking / 2015

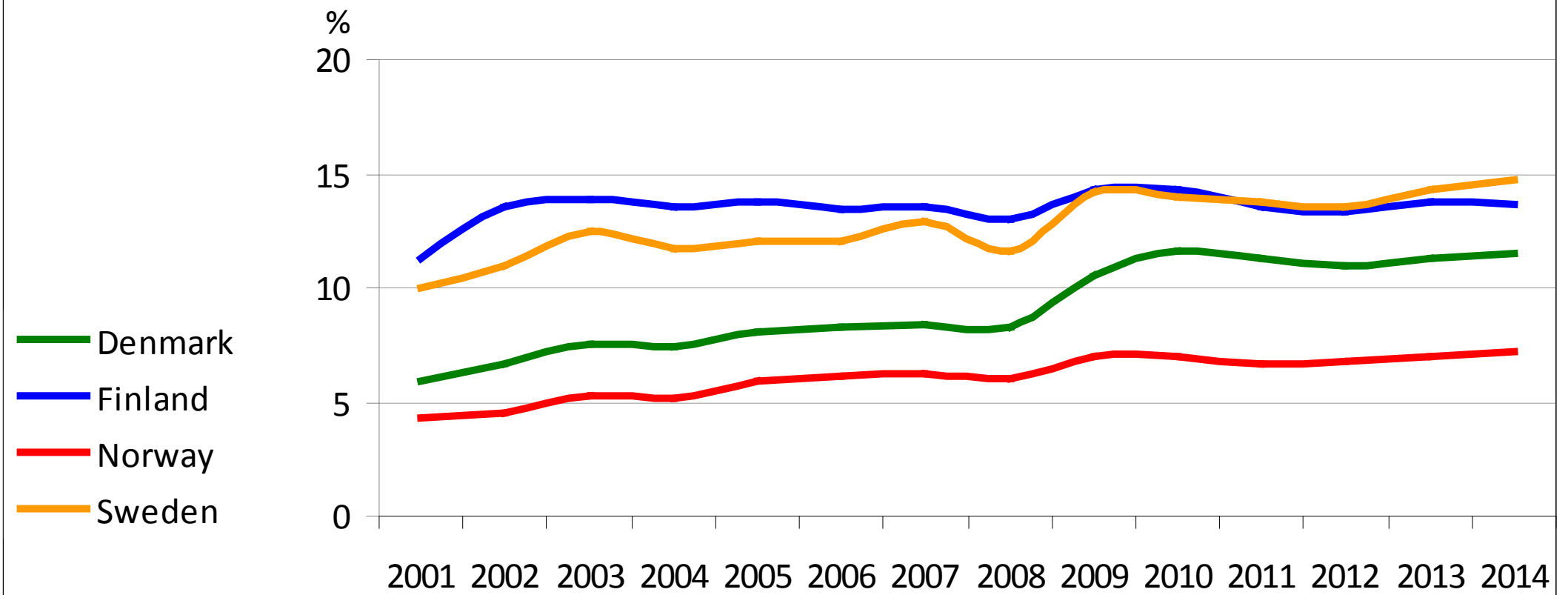
University-Industry collaboration / Share of projects / Percentage change from 2006-2009 (= 0.0)



Source: CWTS / Centre for Science and Technology Studies / Leiden Ranking / 2015



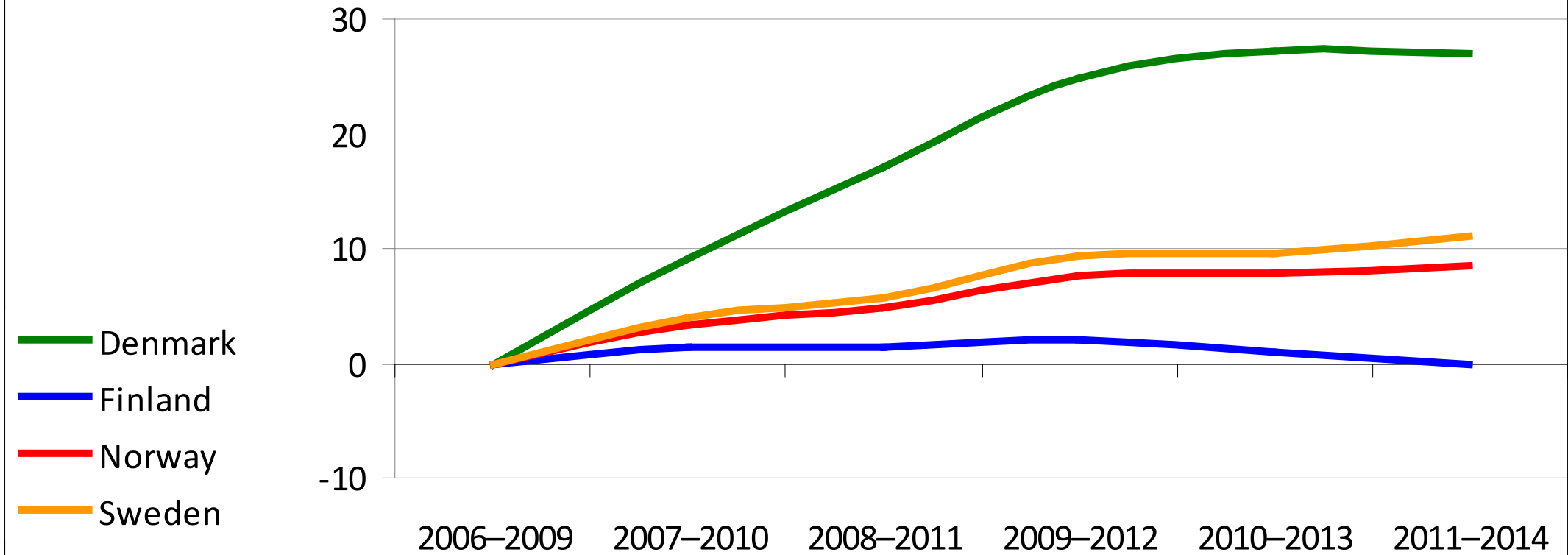
University-Industry collaboration / Impact on GDP formation



Source: bima nic / NIC 2014



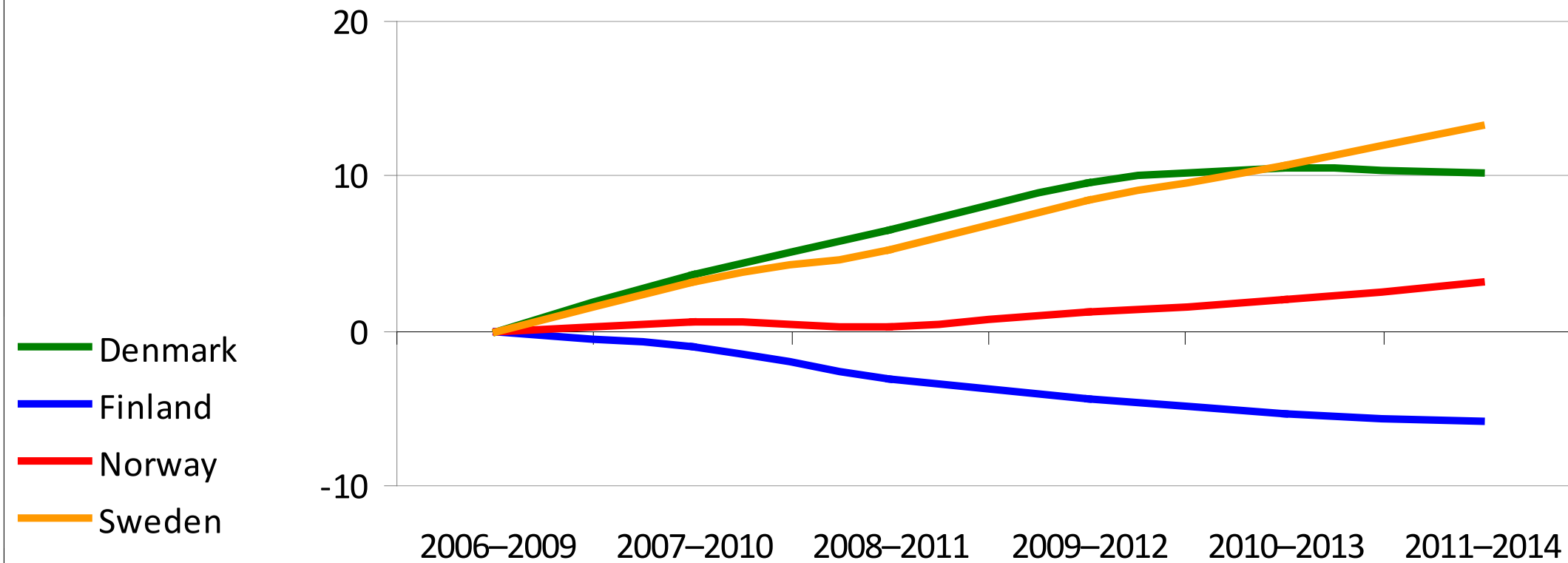
University-Industry collaboration / Impact in GDP / Percentage change from 2006-2009 (= 0.0)



Source: bimac nic / NIC 2014


















University-Industry collaboration / Output-input efficiency / Percentage change from 2006-2009 (= 0.0)



Source: bima nic / NIC 2014

NIC Renewal capital / NRC 2014

Europe and added USA

RANK	Country	Trend Strength	Impact in GDP / %	Efficiency ratio	Index value	RANK(Impact)	
1	Sweden		0.27	22.23	6.43	8.10	1
2	Switzerland		0.27	19.89	6.06	8.02	2
3	USA		0.18	19.83	5.90	9.17	3
4	Finland		0.09	19.26	5.18	8.05	4
5	Denmark		0.25	17.96	4.79	7.66	6
6	Iceland		-0.01	16.34	4.56	7.69	7
7	Germany		0.10	15.63	4.98	7.24	8
8	Luxembourg		-0.10	14.83	5.17	7.07	10
9	Netherlands		0.01	14.24	4.35	7.29	13
10	Austria		-0.21	14.19	4.27	6.68	14
11	Lithuania		0.47	13.89	4.56	6.71	15
12	Belgium		-0.26	13.66	4.48	6.81	17
13	Norway		0.01	12.89	4.30	6.60	21
14	United Kingdom		-0.06	12.87	4.07	6.86	22
15	Ireland		0.37	12.72	3.94	6.27	23

Cooperation between universities and companies

(NIC Indicator RC7)

- *Industry university co-operation* significantly strengthens both economic impact and investment efficiency of *Renewal Capital**
- Global co-operation strengthens investment efficiency (input-output ratio) more than domestic co-operation**

*correlation 0.58 and 0.34 respectively

**correlation 0.41 and 0.22 respectively