

KULTURELLE ORIENTIERUNGEN UND INNOVATION IN 55 LÄNDERN

EINE SEKUNDÄRANALYSE DES ZUSAMMENHANGES DER
GLOBE-DIMENSIONEN MIT DER LANDESINNOVATIVITÄT

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FRAGESTELLUNG

Welcher Zusammenhang besteht zwischen Nationalkultur und Landesinnovativität?

- Welche Kulturdimensionen sind hierfür relevant?
- Lassen sich Länder aufgrund innovationsrelevanter Kulturdimensionen zu bedeutsamen Cluster gruppieren?
- Welche Cluster ergeben sich, und wie unterscheiden sich diese?
- Besteht ein Zusammenhang zwischen der Kombination dieser Kulturdimensionen (kulturelle Konfiguration) und der Landesinnovativität?

THEORETISCHER HINTERGRUND

KULTURDIMENSIONEN

Hofstede:

Machtdistanz
Kollektivismus vs. Individualismus
Femininität vs. Maskulinität
Unsicherheitsvermeidung

Lang- und Kurzzeitorientierung

(Hofstede ,1980, 1988)

GLOBE:

Machtdistanz
Unsicherheitsvermeidung
Gruppen-Kollektivismus
Institutioneller Kollektivismus
Geschlechtergleichheit
Bestimmtheit
Zukunftsorientierung
Leistungsorientierung
Humanorientierung

(House et al., 2004)

BISHERIGE STUDIEN IM ÜBERBLICK

Zusammenhang zwischen Nationalkultur und Innovation wurde gezeigt durch

- **Cultural influences on national rates of innovation** (Shane, 1992)
- **A meta-analysis on the influence of national culture on innovation capability** (Sun, 2009)
- **Does culture still matter?: The effects of individualism on national innovation rates** (Taylor et al., In Press)

Weitere Studien:

- **Identifying innovative national markets for technical consumer goods** (Lynn et al., 1996)
- **The Influence of National Culture on the Formation of Technology Alliances by Entrepreneurial Firms** (Steensma et al., 2000)
- **The Effect of National Culture on the Adoption of Innovations** (Van Everdingen et al., 2005)

BISHERIGE STUDIEN - DATEN & RESULTATE

Study	Daten	Resultate
Shane, 1993	UV: Hofstede AV: Patents, per Capita income	- Individualism (+) - Uncertainty Avoidance (-) - Power Distance (-)
Sun, 2009	UV: Hofstede AV: Porter & Stern Index	- Individualism (+) - Uncertainty Avoidance (-) - Power Distance (-)
Taylor et al., In Press	UV: GLOBE, Hofstede, Schwartz (Collectivism) AV: Citation-weighted patents & scientific publications	- In Group Collectivism (-) - Institutional Collectivism (+)

EMPIRISCHE DATEN

BISHERIGE STUDIEN VS. UNSERE STUDIE

Bisherige Studien

UV:

- Hofstede Dimensionen
- Einzelne Dimensionen anderer Kulturmodelle

AV:

- Mix aus verschiedenen Indikatoren
- Porter und Stern Index

Unsere Studie

UV:

- **GLOBE Dimensionen**

AV:

- **Global Innovation Index**
- Zusätzlich:
Porter & Stern Index

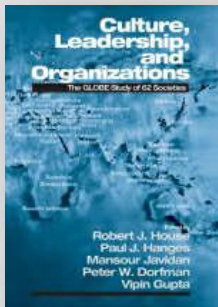
EMPIRISCHE DATEN

GLOBE DIMENSIONEN

Umfangreiches und aktuelles Forschungsprojekt zur Untersuchung von Nationalkultur

Daten zu:

- 62 Ländern
- 17.300 Manager (mittleres Management)
- 951 Organisationen (keine multinationalen Unternehmen)
- Unterscheidung zwischen Normen & Praktiken



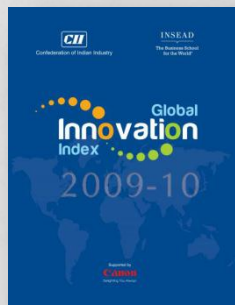
Anspruch:
Reduktion Probleme der Hofstede-Studie

EMPIRISCHE DATEN

GLOBAL INNOVATION INDEX (GII)

Derzeit umfangreichster Innovationsindex

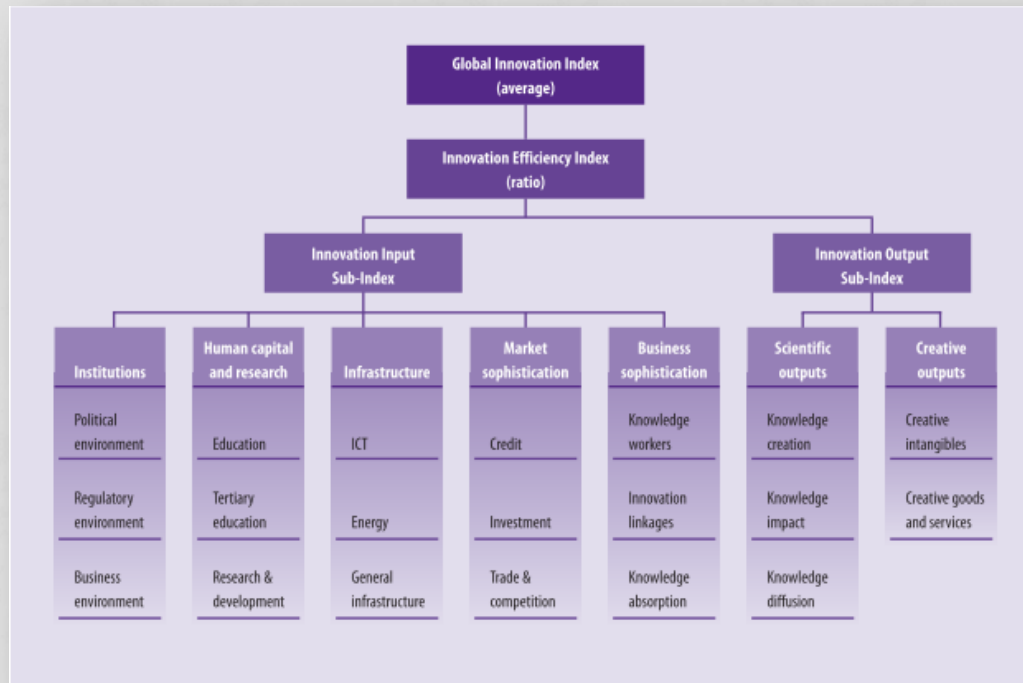
- Integration innovationsrelevanter Daten
- 60 Variablen
 - Jede Variable basierend aus mehreren Indikatoren
 - 36 Ökonomische Indikatoren (UN, World Bank, UNESCO)
 - 24 Survey Data Indikatoren (UNESCO, World Economic Forum)
 - Konzeptionelle und statistische Kohärenz des GII wurde vom European Joint Commission Research Center analysiert und bestätigt



Anspruch:
Derzeit elaboriertestes Mass der Landesinnovativität

EMPIRISCHE DATEN

GLOBAL INNOVATION INDEX



Germany			
<i>Key indicators</i>			
Population (millions)	82.1		
GDP per capita, PPP (current international \$)	36,267.4		
GDP (US\$ billions)	3,330.0		
Global Innovation Index Score 0-100 Rank			
Global Innovation Index	54.9	12	
Innovation Output Sub-Index	58.7	4	
Innovation Input Sub-Index	50.0	21	
Innovation Efficiency Index	8.9	15	
Global Innovation Index 2010		16	
Global Innovation Index 2009		7	
1 Institutions 83.5 21			
1.1 Political environment	88.1	16	
1.1.1 Political stability*	76.9	25	
1.1.2 Government effectiveness*	91.9	15	
1.1.3 Press freedom*	95.5	16	
1.2 Regulatory environment	81.1	23	
1.2.1 Regulatory quality*	92.4	16	
1.2.2 Rule of law*	92.9	15	
1.2.3 Rigidity of employment*	58.0	100	
1.3 Business environment	81.2	29	
1.3.1 Time to start a business, days	86.5	59	
1.3.2 Cost to start a business, % income/cap.	96.3	40	
1.3.3 Total tax rate, % profits	60.9	91	
2 Human capital & research 57.5 11			
2.1 Education	72.5	12	
2.1.1 Education expenditure, % GNI	45.7	59	
2.1.2 Public expenditure/pupil, % GDP/cap.	n/a	n/a	
2.1.3 School life expectancy, years	n/a	n/a	
2.1.4 PISA scales in reading, maths, & science	73.5	13	
2.1.5 Pupil-teacher ratio, secondary	85.3	54	
2.2 Tertiary education	42.4	24	
2.2.1 Tertiary enrollment, % gross	n/a	n/a	
2.2.2 Graduates in science, %	54.0	15	
2.2.3 Graduates in engineering, %	41.3	37	
2.2.4 Tertiary inbound mobility, %	n/a	n/a	
2.2.5 Tertiary outbound mobility, %	n/a	n/a	
2.2.6 Gross tertiary outbound enrolment, %	21.3	43	
2.3 Research & development (R&D)	57.8	14	
2.3.1 Researchers headcount/million pop.	40.3	13	
2.3.2 Gross expenditure on R&D, % GDP	51.9	11	
2.3.3 Quality research institutions†	81.1	6	
3 Infrastructure 43.2 21			
3.1 Info & comm. technologies (ICT)	63.7	15	
3.1.1 ICT access*	85.4	4	
3.1.2 ICT use*	47.6	17	
3.1.3 Government's Online Service*	54.9	21	
3.1.4 E-Participation*	61.4	15	
3.2 Energy	25.2	40	
3.2.1 Electricity output, kWh/cap.	37.3	28	
3.2.2 Electricity consumption, kWh/capita	28.4	36	
3.2.3 GDP/unit of energy use, PPP\$/kg oil eq.	16.5	37	
3.2.4 Share of renewables in energy use, %	6.1	83	
3.3 General infrastructure	40.9	33	
3.3.1 Quality of trade & transport infrastructure*	83.5	1	
3.3.2 Gross capital formation, % GDP	13.2	106	
3.3.3 Ecological footprint & biocapacity, ha/cap.	25.6	98	
4 Market sophistication 59.3 14			
4.1 Credit	85.0	5	
4.1.1 Strength of legal rights for credit*	70.0	37	
4.1.2 Depth of credit information*	100.0	1	
4.1.3 Domestic credit to private sector, % GDP	n/a	n/a	
4.1.4 Microfinance gross loans, % GDP	n/a	n/a	
4.2 Investment	34.5	44	
4.2.1 Strength of investor protection*	50.0	70	
4.2.2 Market capitalization, % GDP	15.5	47	
4.2.3 Total value of stocks traded, % GDP	21.4	29	
4.2.4 Venture capital deals/GDP PPP	67.4	26	
4.3 Trade & competition	58.5	30	
4.3.1 Applied tariff rate-weighted mean, %	94.3	12	
4.3.2 Market access trade restrictiveness*, %	n/a	n/a	
4.3.3 Imports of goods & services, % GDP	19.7	49	
4.3.4 Exports of goods & services, % GDP	35.2	53	
4.3.5 Intensity local competition†	85.0	1	
5 Business sophistication 51.6 20			
5.1 Knowledge workers	66.9	25	
5.1.1 Knowledge-intensive employment, %	81.3	14	
5.1.2 Firms offering formal training, % firms	58.3	43	
5.1.3 R&D performed by business, %	82.4	15	
5.1.4 R&D financed by business, %	80.1	9	
5.2 Innovation linkages	43.3	30	
5.2.1 University/industry collaboration†	70.6	9	
5.2.2 State of cluster development†	64.3	8	
5.2.3 R&D financed by abroad, %	14.1	54	
5.2.4 JV/strategic alliance deals/GDP PPP	138.45	45	
5.2.5 PCT patent filings with foreign inventor, %	245.1	41	
5.3 Knowledge absorption	44.5	25	
5.3.1 Royalty & license fees payments, % GDP	42.0	21	
5.3.2 High-tech imports less re-exports, %	38.5	23	
5.3.3 Computer & comm. service imports, %	56.9	26	
5.3.4 FDI net inflows, % GDP	40.8	94	
6 Scientific outputs 49.8 14			
6.1 Knowledge creation	69.2	7	
6.1.1 Domestic resident patent ap/bn GDP PPP	100.0	4	
6.1.2 PCT resident patent ap/bn GDP PPP	78.4	9	
6.1.3 Domestic res. utility model ap/bn GDP PPP	39.6	11	
6.1.4 Scientific & technical articles/bn GDP PPP	43.9	21	
6.2 Knowledge impact	26.6	77	
6.2.1 Growth rate of GDP PPPs/worker, %	34.5	85	
6.2.2 New businesses/1,000 pop. 15-64 yrs.	9.2	53	
6.2.3 Computer software spending, % GDP	45.4	16	
6.3 Knowledge diffusion	53.6	18	
6.3.1 Royalty & license fees receipts, % GDP	55.4	14	
6.3.2 High-tech exports less re-exports, %	36.6	20	
6.3.3 Computer & comm. service exports, %	70.0	19	
6.3.4 FDI net outflows, % GDP	52.4	28	
7 Creative outputs 51.7 6			
7.1 Creative intangibles	56.1	23	
7.1.1 Domestic res. trademark ap/bn GDP PPP	188	54	
7.1.2 Madrid resident trademark ap/bn GDP PPP	61.7	11	
7.1.3 ICT & business models†	77.4	11	
7.1.4 ICT & organizational models†	69.4	15	
7.2 Creative goods & services	47.2	8	
7.2.1 Recreation & culture consumption, %	65.8	25	
7.2.2 National feature films/mn pop.	28.5	27	
7.2.3 Daily newspapers/1,000 literate pop.	48.1	11	
7.2.4 Creative goods exports, %	26.0	35	
7.2.5 Creative services exports, %	68.1	7	

EMPIRISCHE DATEN

UNSER SAMPLE

- Kriterien für die Aufnahme eines Landes in unser Sample
 - **UV:** Daten über kulturelle Werte und Praktiken basierend auf der GLOBE Studie
 - **AV:** Innovationsbezogene Daten in allen drei bisher publizierten Editionen der GII (2009,2010,2011)

Resultat:

Sample bestehend aus 55 Ländern

METHODE & RESULTATE

HIERARCHISCHE REGRESSIONSANALYSE

	R	R ²	<u>Corrected</u> R ²	Included Variables
Porter und Stern Index	.863	.745	.512	Uncertainty Avoidance (V), Human Orientation (V), Institutional Collectivism (V), In Group Collectivism (P)
GII 2009	.765	.585	.561	Uncertainty Avoidance (V), Human Orientation (V), Performance Orientation (P)
GII 2010	.835	.697	.673	Uncertainty Avoidance (V), Institutional Collectivism (P), Human Orientation (P), In Group Collectivism (P)
GII 2011	.767	.589	.565	Uncertainty Avoidance (V), Human Orientation (V), In Group Collectivism (P)

AV

	Porter & Stern	GII 2009	GII 2010	GII 2011
Uncertainty Avoidance (V)	-.247	-.431	-.457	-.412
Human Orientation (V)	.444	.314		.229
In Group Collectivism (P)	.261		-.227	-.282
Institutional Collectivism (P)			.319	
Performance Orientation (P)		.263		
Human Orientation (P)			-.224	
Institutional Collectivism (V)	-.199			



UV

Standardized Beta Coefficients

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INNOVATIONSRELEVANTE KULTURDIMENSIONEN

Uncertainty Avoidance:

“... is the extent to which members of a organization or society strive to **avoid uncertainty** by relying on **established social norms, rituals, and bureaucratic practices.**“



Unsicherheitsvermeidung - Hoch

- Viele Regeln und rigide Planung
- Viele Kontrollsysteme
- Formalisierte Prozesse
- Wenig Toleranz gegenüber neuen und andersartigen Ideen und Ansätzen
- Expertentum „persons beyond uncertainty“

Unsicherheitsvermeidung - Niedrig

- Höheres Vertrauen
- Mehr Toleranz für neue und andersartige Ideen
- Höhere Partizipation
- Bereitschaft Fehler zu machen
- Bereitschaft Unsicherheit und Risiken in Kauf zu nehmen

(Hofstede, 2009; de Luque, 2004; Herbig, 1998)

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INNOVATIONSRELEVANTE KULTURDIMENSIONEN

In-group Collectivism:

“... is the degree to which individuals express **pride, loyalty, and cohesiveness** in their organizations or families.”



Gruppen Kollektivismus- Hoch

- Starre Strukturen und Hierarchien
- Weniger Offenheit für neue Ideen
- Weniger Kontakt und Austausch zwischen Hierarchiestufen
- Mehr Gruppendenken

Gruppen Kollektivismus - Niedrig

- Mehr Offenheit für Neues und Veränderungen
- Höhere Autonomie des Individuums
- Höhere Außenorientierung
- Mehr Kontakt zu anderen Gruppen > Ideenaustausch
- Weniger Gruppendenken

(Shane, 1993; Schwartz, 1999; Hofstede, 1990; Gelfand et al., 2004; Taylor & Wilson, in Press)

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INNOVATIONSRELEVANTE KULTURDIMENSIONEN

Human Orientation:

“... is the degree to which individuals in organizations or societies **encourage and reward individuals for being fair, altruistic, friendly, generous, caring, and kind to others.**”



Humanorientierung - Hoch

- Mehr Hilfe und Unterstützung (support)
- Mehr Toleranz
- Gleichmäßigere Verteilung von Ressourcen und Bildung
- Geringere Notwendigkeit von engen und einschränkenden Beziehungen und Patronage
- Generelle stabilere Umweltbedingungen

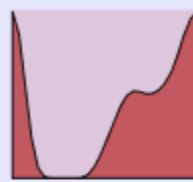
Humanorientierung - Niedrig

- Schlechtere ökonomische, physische und psychische Rahmenbedingungen
- Weniger Autonomie
- Weniger Toleranz & Support für neues und neue Ideen
- Generell instabilere Umweltbedingungen

(Kabasakal, 2004; Schwartz, 1992; Triandis, 2006)

METHODE & RESULTATE

CLUSTER ANALYSE - EXPLORATIV

Label	Description	Size	Features		
1.High	Austria, Canada, Denmark, Britain/UK, Finland, France, Germany, Ireland, Israel, Japan, Namibia, Netherlands, New Zealand, Sweden, Switzerland, United States	 29.1% (16)	G_InGroupColl_P 	G_UnAvoid_V 	G_HumOri_V 
2.Medium	Argentina, Australia, Brazil, Colombia, Georgia, Hong Kong, Hungary, Italy, Kazakhstan, Korea (south), Malaysia, Nigeria, Portugal, Russia, Singapore, South Africa, Spain, Turkey, Zambia	 34.5% (19)	G_InGroupColl_P 	G_UnAvoid_V 	G_HumOri_V 
3.Low	Albania, Bolivia, China, Costa Rica, Ecuador, Egypt, El Salvador, Greece, Guatemala, India, Indonesia, Kuwait, Mexico, Morocco, Philippines, Poland, Slovenia, Thailand, Venezuela, Zimbabwe	 36.4% (20)	G_InGroupColl_P 	G_UnAvoid_V 	G_HumOri_V 

METHODE & RESULTATE

DISKRIMINANZANALYSE - KONFIRMATIV

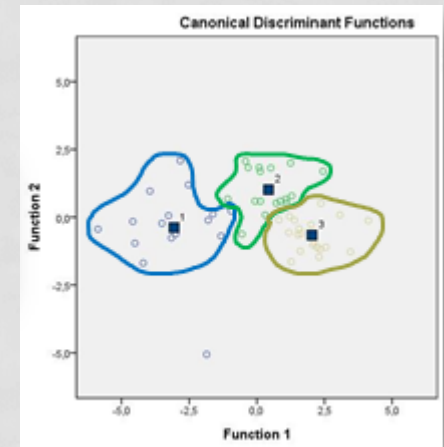
Gebildete Cluster

53 Länder: Clusteranalyse = Diskriminanzanalyse

2 Länder: Clusteranalyse ≠ Diskriminanzanalyse

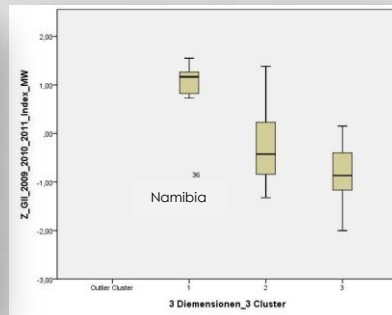
- Irland (▼)
- El Salvador (▲)

Wilks' Lambda				
Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	,113	110,975	6	,000
2	,630	23,589	2	,000



Cluster & Landesinnovativität

Label	1.High	2.Medium	3.Low
Description	Austria, Canada, Denmark, Britain, UK, Finland, France, Germany, Ireland, Israel, Japan, Namibia, Netherlands, New Zealand, Sweden, Switzerland, United States	Argentina, Australia, Brazil, Colombia, Georgia, Hong Kong, Hungary, Italy, Kazakhstan, Korea (south), Malaysia, Nigeria, Portugal, Russia, Singapore, South Africa, Spain, Turkey, Zambia	Albania, Bolivia, China, Costa Rica, Ecuador, Egypt, El Salvador, Greece, Guatemala, India, Indonesia, Kuwait, Mexico, Morocco, Philippines, Poland, Slovenia, Thailand, Venezuela, Zimbabwe
Size	29.1% (16)	34.5% (19)	36.4% (20)
Features	 	 	



Ausreiser:

Namibia

Gruppen Kollektivismus (P) > Low
 Unsicherheitsvermeidung (V) > Low
 Humanorientierung (V) > High

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KULTURELLE KONFIGURATION – LANDESINNOVATIVITÄT

Kulturelle Konfiguration hoch innovativer Länder

- Niedrige Unsicherheitsvermeidung (V)
- Niedriger Gruppen Kollektivismus (P)
- Hohe Human Orientierung (V)

Unsicherheitsvermeidung (V) ↓
 Gruppen-Kollektivismus (P) ↓
 Humanorientierung (V) ↑

Label	Description	Size	G_InGroupColl_P	G_UnAvoid_V	G_HumOri_V
1.High	Austria, Canada, Denmark, Britain/UK, Finland, France, Germany, Ireland, Israel, Japan, Namibia, Netherlands, New Zealand, Sweden, Switzerland, United States	29.1% (16)			
2.Medium	Argentina, Australia, Brazil, Colombia, Georgia, Hong Kong, Hungary, Italy, Kazakhstan, Korea (south), Malaysia, Nigeria, Portugal, Russia, Singapore, South Africa, Spain, Turkey, Zambia	34.5% (19)			
3.Low	Albania, Bolivia, China, Costa Rica, Ecuador, Egypt, El Salvador, Greece, Guatemala, India, Indonesia, Kuwait, Mexico, Morocco, Philippines, Poland, Slovenia, Thailand, Venezuela, Zimbabwe	36.4% (20)			

Kulturelle Konfiguration niedrig innovativer Länder:

- Hoher Gruppen Kollektivismus (P)
- Hohe Unsicherheitsvermeidung (V)
- Niedrige Humanorientierung (V)

Cluster 1	Austria, Canada, Denmark, Britain/UK, Finland, France, Germany, Ireland, Israel, Japan, Namibia, Netherlands, New Zealand, Sweden, Switzerland, United States
Cluster 2	Argentina, Australia, Brazil, Colombia, Georgia, Hong Kong, Hungary, Italy, Kazakhstan, Korea (south), Malaysia, Nigeria, Portugal, Russia, Singapore, South Africa, Spain, Turkey, Zambia
Cluster 3	Albania, Bolivia, China, Costa Rica, Ecuador, Egypt, El Salvador, Greece, Guatemala, India, Indonesia, Kuwait, Mexico, Morocco, Philippines, Poland, Slovenia, Thailand, Venezuela, Zimbabwe

DISKUSSION

„Culture matters“

Bestätigung des generellen Zusammenhangs zwischen Nationalkultur und Landesinnovativität mittels neuerer, umfangreicherer, erstmalig verwandter Daten und Maße für

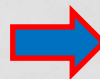
- Nationalkultur
- Landesinnovativität

Aber:

- National-kulturell bedingte innovationsförderliche Faktoren stellen einen Einflussfaktor (multifaktorielle Bedingtheit der Innovativität) keinen Grund dar
- Beachtung zusätzlicher Einflussfaktoren
- Kultur ist und wirkt multidimensional – Verschiedene Ebenen der Analyse

Kulturelle Konfiguration wenig innovativer Länder:

Hohe Unsicherheitsvermeidung (V)
Hoher Gruppen Kollektivismus (P)
Niedrige Humanorientierung (V)



Cluster 1	Austria, Canada, Denmark, Britain/UK, Finland, France, Germany, Ireland, Israel, Japan, Namibia, Netherlands, New Zealand, Sweden, Switzerland, United States
Cluster 2	Argentina, Australia, Brazil, Colombia, Georgia, Hong Kong, Hungary, Italy, Kazakhstan, Korea (south), Malaysia, Nigeria, Portugal, Russia, Singapore, South Africa, Spain, Turkey, Zambia
Cluster 3	Albania, Bolivia, China, Costa Rica, Ecuador, Egypt, El Salvador, Greece, Guatemala, India, Indonesia, Kuwait, Mexico, Morocco, Philippines, Poland, Slovenia, Thailand, Venezuela, Zimbabwe

Herzlichen Dank für Ihre
Aufmerksamkeit !