

Competitiveness measurement: alternative approaches

ipea

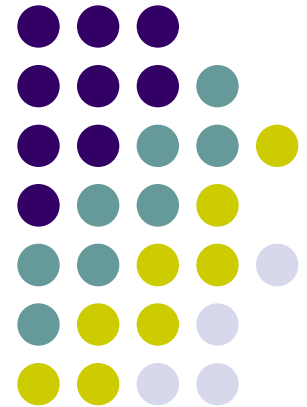
Instituto de Pesquisa
Econômica Aplicada

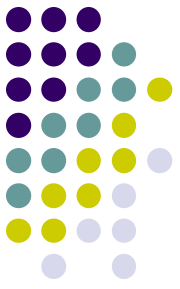


Agência Brasileira de
Desenvolvimento Industrial

USP

Universidade de São Paulo

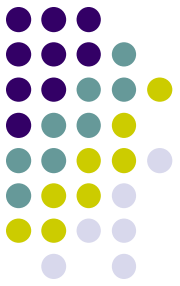




Summary

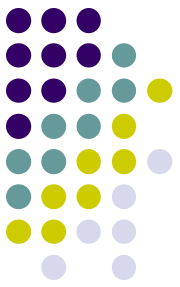
- Competitiveness: earlier definitions
- The Porter's approach
- The most famous competitiveness indexes: The CGI from the WEF and the WCS from the IMD.
- Strengths and weaknesses of these indexes
- Towards an alternative approach, based on competitive strategies of the firms

Competitiveness: earlier definitions



- First definitions of competitiveness were basically related to the trade balance, in a mercantilist sense.
- Hence, the first generation of competitiveness indicators was based on world market shares for a nation's products, relatively or not to the country's size or stage of development.

Competitiveness: earlier definitions (2)

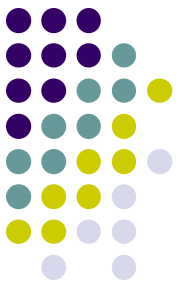


- However, since the mercantilist view of competitiveness implies that world trade is a zero-sum game, it can support misleading public policies, such as protectionism, wage policies and exchange rate over-devaluations in order to “keep the nation competitive” (although this kind of policies still sounds very appealing to the public opinion).

Competitiveness: earlier definitions (3)

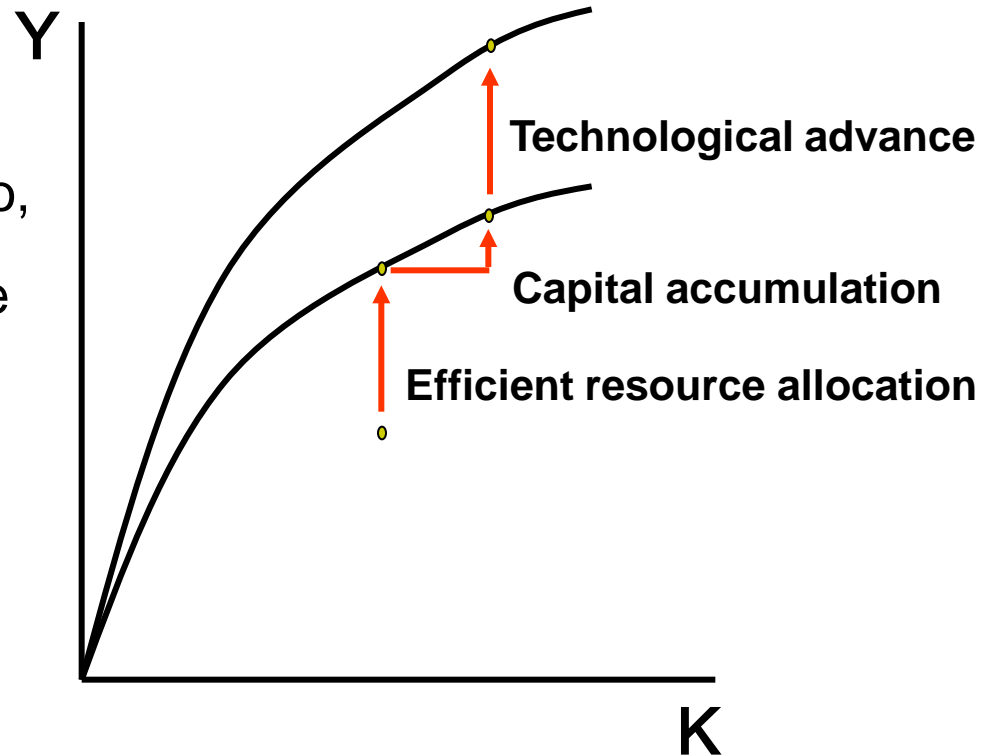


- Then specialists became to take into account wages, productivity and living standards of a nation as the main goals to be competitive internationally. Thus, the trade balance began to be seen as a pre-condition and a means to these aims, since everybody knows about the consequences of trade-unbalanced growth.

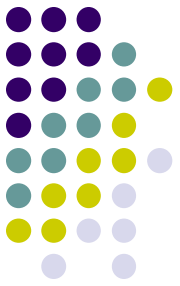


The Porter's approach

- Michael Porter's *The Competitive advantage of nations* stresses that the competitiveness of a nation can't be measured as a block, since no nation is can be competitive in all industries. So, the only relevant measure of national competitiveness is the productivity level, which is determined by resources' allocation, capital accumulation and technological advance.

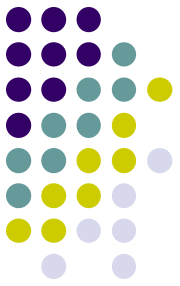


The Porter's approach (2)



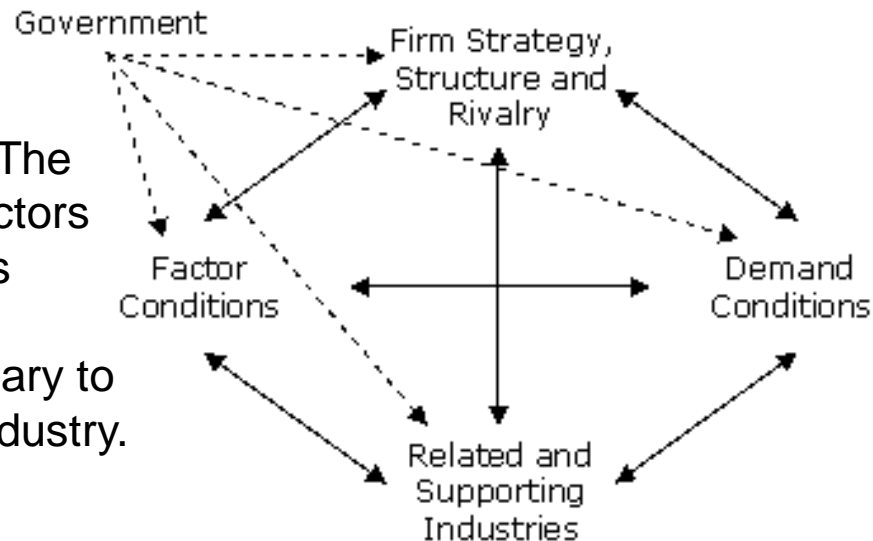
- In this sense, “prosperity is created, not inherited. It does not grow out of a country’s natural endowments, its interest rates, or its currency’s value”.
- The very nature of the competitive advantage of firms is based on innovation, in its broadest sense: new ways of doing things – business and organizational innovations, adding services to products and so on. Innovative firms compete by differentiating their products or services, so their competitive advantage does not rely on low costs and price competition.
- The link between firms’ innovation-based strategies and success and the competitive advantage of nations is provided by the four attributes of a nation that individually and as a system constitute the “Porter’s Diamond”.

The Porter's Diamond



Firm Strategy, Structure and Rivalry: The conditions in the nation governing how companies are created, organized and managed, as well as the nature of domestic rivalry.

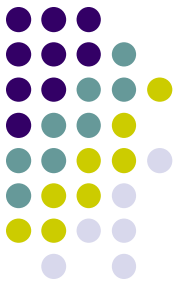
Factor Conditions : The nation's position in factors of production, such as skilled labor or infrastructure, necessary to compete in a given industry.



Demand Conditions: The nature of home-market demand for the industry's product or service.

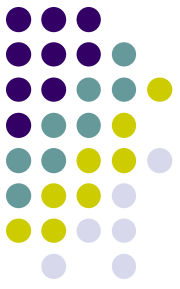
Related and Supporting Industries: The presence or absence in the nation of supplier industries and other related industries that are internationally competitive.

Porter's stages of development



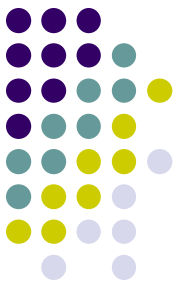
- Porter also provides a typology of stages of economic development, which is supposed to occur in four phases:
 1. Factor-Driven – based on natural resources or cheap unskilled labor;
 2. Investment-Driven – a phase when there is huge capital accumulation through domestic and international savings, and consequently productivity boosts;
 3. Innovation-Driven – according to Porter, the most prosperous stage, when firms seek innovation as a competitive strategy;
 4. Wealth-Driven – countries are at the last stage when competition is less intense, firms seek keeping their positions, usually through government policies (rent-seeking behavior), and workers have non-economic aspirations.

The role of the government in Porter's framework



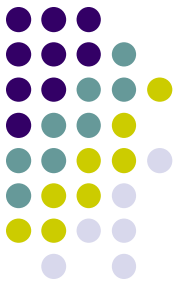
- The role of the government is rather *inductive* than *proactive*, in the sense that it should strengthen the corners of the diamond, for example providing macro stability, adequate infra-structure and quality basic education; financing basic research and fomenting the National Innovation System, applying anti-trust policies, ensuring competition and so forth.

Main criticisms on competitiveness and the Krugman-Dunning controversy



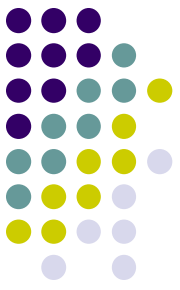
- The most famous critique-article to the competitiveness concept is Paul Krugman's "Competitiveness: a dangerous obsession".
- The main arguments are:
 1. The concept is wrong: countries do not "compete" in the same way enterprises do, surpluses do not necessarily mean prosperity and international trade is not a zero-sum game;
 2. Competitiveness theorists use very loose concepts such as "high value-added sectors" or confound **comparative** advantage with **competitive** advantage

Main criticisms on competitiveness and the Krugman-Dunning controversy (2)



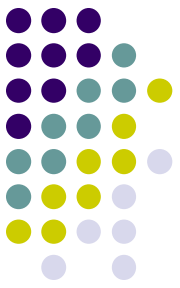
3. Notwithstanding competitiveness is a meaningless word, one may argue that its rhetorical use is useful. However, misconceptions may lead to wrong policies.
 - So, why competitiveness is so popular?
 1. It's business language, and thus it sounds strongly appealing to politicians and their supporters;
 2. Some domestic problems are put in an international context.

Main criticisms on competitiveness and the Krugman-Dunning controversy (3)



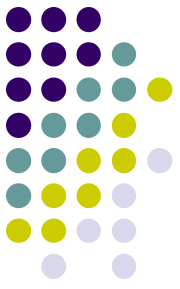
- Professor Dunning's reply to Krugman focused in three points:
 1. *Competitiveness does matter* because it's a way of benchmarking policies and productivity.
 2. *Competitiveness does matter* if there are market imperfections, innovation externalities, ownership competitive advantages, capital mobility and intense intra-industry trade.
 3. Competitiveness doesn't matter only if the H-O theorem conditions holds (and productivity differentials are unavoidable).
- Krugman's response: "I've never said benchmarking was not important, and I've never neglected market failures."

Main criticisms on competitiveness and the Krugman-Dunning controversy (4)



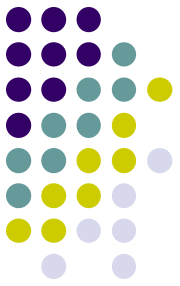
- Other criticisms:
 1. Porter does not define anywhere in his book what he means exactly by competitiveness and its scope (Industry-level or national-level? National productivity or market share of national goods? By the way, what's a national good?).
 2. The methodology is clearly inductive, but he doesn't explicit what were the criteria to select the cases.

Main criticisms on competitiveness and the Krugman-Dunning controversy (4)



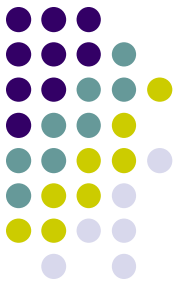
3. He assumes that the price elasticity of differentiated products is zero.
4. He doesn't care about factors' scarcities or misallocations in the production of differentiated products.
5. His theory has to be seriously modified to deal with transnational companies.
6. "Real world trade" and commodities exports matter for the sustainability of the differentiated goods strategy.
7. The empirical validity of the theory is highly questionable.

And what now?



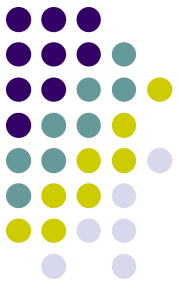
- Nowadays, if one wants to deal with competitiveness, he/she needs to define it in a much broader and dynamic sense. Its concept relies not only on productivity or efficiency concerns, but also in environmental and social issues.
- Hence, an holistic tentative concept would be:
“The competitiveness of a nation means the relationship between factors, policies and institutions and the conditions for firms improve their business performance, given social and environmental concerns”.

The most famous competitiveness indexes



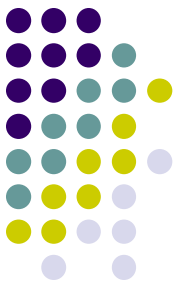
- Doubtlessly, the most famous competitiveness indexes are the Global Competitiveness Index (GCI – the former Growth Competitiveness Index) from the World Economic Forum (WEF) and the World Competitiveness Scoreboard (WCS) from the Institute for Management Development (IMD).
- They are an very comprehensive attempt to translate the concept of competitiveness into indexes and make possible international comparisons.
- Both are Swiss made, published annually and up until the middle of the 90's were the same index.

The most famous competitiveness indexes: methodology



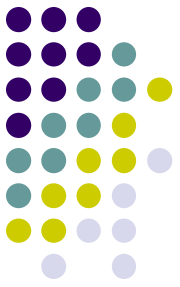
- Both indexes depart from basically the same definition of competitiveness:
- GCI:
 - “Competitiveness [is the] set of factors, policies and institutions that determine the level of productivity of a country”
The Global Competitiveness Report, WEF, 2006
- WCS:
 - “Competitiveness analyses how nations and enterprises manage the totality of their competencies to achieve prosperity and profit”
IMD World Competitiveness Yearbook 2006

The most famous competitiveness indexes: methodology (2)



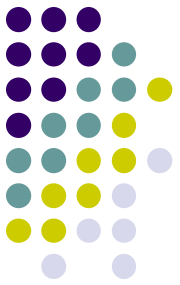
- Similarly, both indexes follow the same methodology:
 1. They are *ex-ante* measures of competitiveness, since they measure not only the performance of the countries but basically the “pillars” for economic growth;
 2. Subindexes for these “pillars” are created, which are condensed onto a scalar and a competitiveness ranking of the nations or regions is provided;
 3. Both rely on hard data as well as soft data from executives and businessman’s opinion surveys, mainly to assess the more subjective pillars, such as the quality of the institutions, governmental favoritism, business sophistication and so on.
- This methodological approach is employed in several other indicators, for example, the World Bank’s assessment of the investment climate.

The most famous competitiveness indexes: Why are they made?



- These indexes are used by:
 1. the business community to assess national environments for investments,
 2. The governments in order to benchmark development policies and to see how other nations perform,
 3. the academics, who use such indexes to analyze how is competitiveness in a global perspective.
- Actually, the rank correlation between them is very high: 0,88

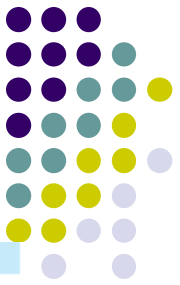
Meet the GCI...



Country/Economy	GCI 2006 Rank	GCI 2006 Score	GCI 2005 Rank
Switzerland	1	5.81	4
Finland	2	5.76	2
Sweden	3	5.74	7
Denmark	4	5.70	3
Singapore	5	5.63	5
United States	6	5.61	1
Japan	7	5.60	10
Germany	8	5.58	6
Netherlands	9	5.56	11
United Kingdom	10	5.54	9
Hong Kong SAR	11	5.46	14
Norway	12	5.42	17
Taiwan, China	13	5.41	8
Iceland	14	5.40	16
Israel	15	5.38	23
Canada	16	5.37	13
Austria	17	5.32	15
France	18	5.31	12
Australia	19	5.29	18
Belgium	20	5.27	20
Ireland	21	5.21	21
Luxembourg	22	5.16	24
New Zealand	23	5.15	22
Korea, Rep.	24	5.13	19
Estonia	25	5.12	26
Malaysia	26	5.11	25
Chile	27	4.85	27
Spain	28	4.77	28
Czech Republic	29	4.74	29
Tunisia	30	4.71	37

Barbados	31	4.70	—
United Arab Emirates	32	4.66	32
Slovenia	33	4.64	30
Portugal	34	4.60	31
Thailand	35	4.58	33
Latvia	36	4.57	39
Slovak Republic	37	4.55	36
Qatar	38	4.55	46
Malta	39	4.54	44
Lithuania	40	4.53	34
Hungary	41	4.52	35
Italy	42	4.46	38
India	43	4.44	45
Kuwait	44	4.41	49
South Africa	45	4.36	40
Cyprus	46	4.36	41
Greece	47	4.33	47
Poland	48	4.30	43
Bahrain	49	4.28	50
Indonesia	50	4.26	69
Croatia	51	4.26	64
Jordan	52	4.25	42
Costa Rica	53	4.25	56
China	54	4.24	48
Mauritius	55	4.20	55
Kazakhstan	56	4.19	51
Panama	57	4.18	65
Mexico	58	4.18	59
Turkey	59	4.14	71
Jamaica	60	4.10	63
El Salvador	61	4.09	60
Russian Federation	62	4.08	53
Egypt	63	4.07	52

Meet the GCI... (2)

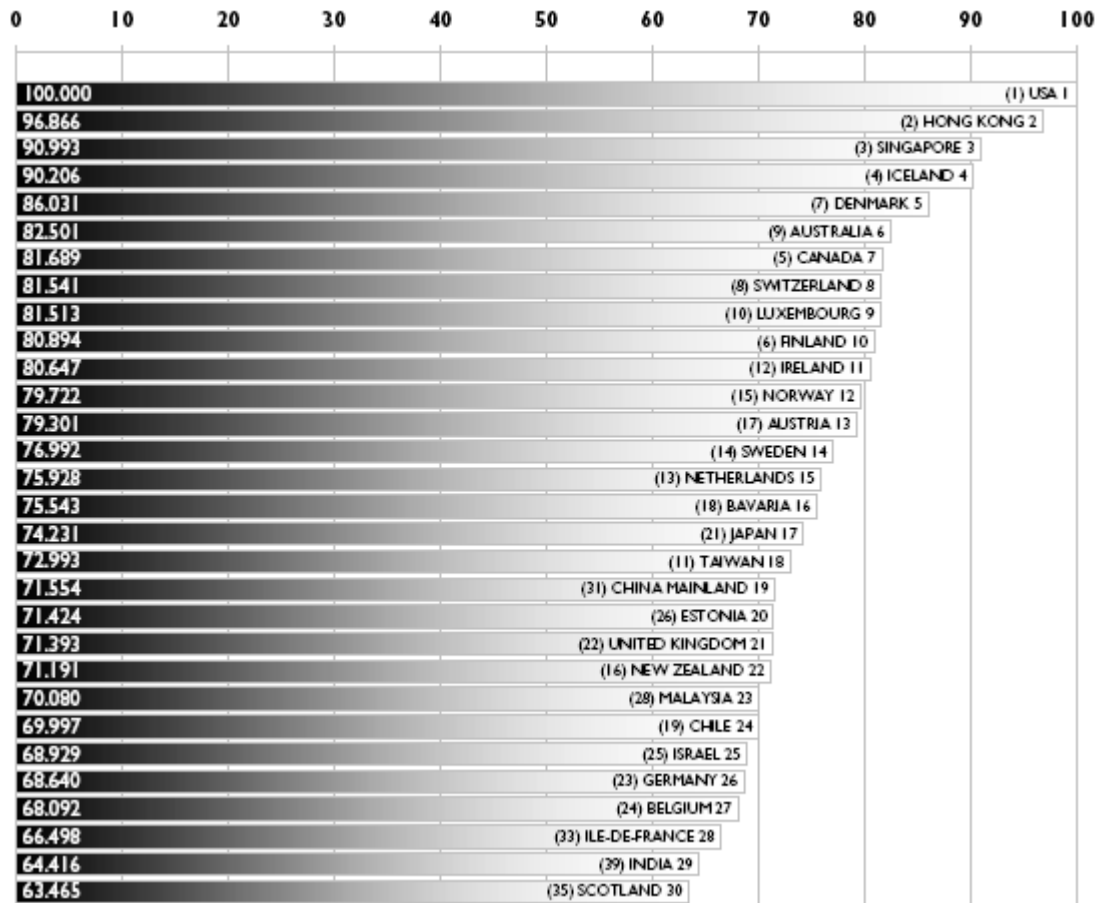
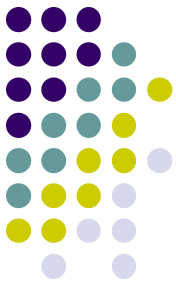


Country/Economy	GCI 2006 Rank	GCI 2006 Score	GCI 2005 Rank
Azerbaijan	64	4.06	62
Colombia	65	4.04	58
Brazil	66	4.03	57
Trinidad and Tobago	67	4.03	66
Romania	68	4.02	67
Argentina	69	4.01	54
Morocco	70	4.01	76
Philippines	71	4.00	73
Bulgaria	72	3.96	61
Uruguay	73	3.96	70
Peru	74	3.94	77
Guatemala	75	3.91	95
Algeria	76	3.90	82
Vietnam	77	3.89	74
Ukraine	78	3.89	68
Sri Lanka	79	3.87	80
Macedonia, FYR	80	3.86	75
Botswana	81	3.79	72
Armenia	82	3.75	81
Dominican Republic	83	3.75	91
Namibia	84	3.74	79
Georgia	85	3.73	86
Moldova	86	3.71	89
Serbia and Montenegro	87	3.69	85
Venezuela	88	3.69	84
Bosnia and Herzegovina	89	3.67	88
Ecuador	90	3.67	87

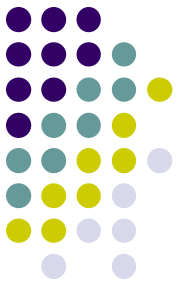
Pakistan	91	3.66	94
Mongolia	92	3.60	90
Honduras	93	3.58	97
Kenya	94	3.57	93
Nicaragua	95	3.52	96
Tajikistan	96	3.50	92
Bolivia	97	3.46	101
Albania	98	3.46	100
Bangladesh	99	3.46	98
Suriname	100	3.45	—
Nigeria	101	3.45	83
Gambia	102	3.43	109
Cambodia	103	3.39	111
Tanzania	104	3.39	105
Benin	105	3.37	106
Paraguay	106	3.33	102
Kyrgyz Republic	107	3.31	104
Cameroon	108	3.30	99
Madagascar	109	3.27	107
Nepal	110	3.26	—
Guyana	111	3.24	108
Lesotho	112	3.22	—
Uganda	113	3.19	103
Mauritania	114	3.17	—
Zambia	115	3.16	—
Burkina Faso	116	3.07	—
Malawi	117	3.07	114
Mali	118	3.02	115
Zimbabwe	119	3.01	110
Ethiopia	120	2.99	116
Mozambique	121	2.94	112
Timor-Leste	122	2.90	113
Chad	123	2.61	117
Burundi	124	2.59	—
Angola	125	2.50	—

Source: Global Competitiveness Report, 2006

And the WCS



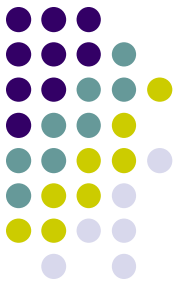
And the WCS



63.003	(36) CZECH REPUBLIC 31
62.598	(27) THAILAND 32
61.286	(20) ZHEJIANG 33
61.262	(32) CATALONIA 34
60.813	(30) FRANCE 35
58.384	(38) SPAIN 36
57.861	(42) MAHARASHTRA 37
57.680	(29) KOREA 38
57.436	(40) SLOVAK REPUBLIC 39
57.351	(47) COLOMBIA 40
57.316	(37) HUNGARY 41
54.149	(50) GREECE 42
52.808	(45) PORTUGAL 43
52.007	(46) SOUTH AFRICA 44
51.641	(52) SLOVENIA 45
51.292	(44) JORDAN 46
50.873	BULGARIA 47
49.408	(43) SAO PAULO 48
49.041	(49) PHILIPPINES 49
47.315	(41) LOMBARDY 50
47.069	(48) TURKEY 51
46.416	(51) BRAZIL 52
44.871	(56) MEXICO 53
44.738	(54) RUSSIA 54
43.663	(58) ARGENTINA 55
43.531	(53) ITALY 56
42.130	(55) ROMANIA 57
39.955	(57) POLAND 58
38.957	CROATIA 59
36.051	(59) INDONESIA 60
32.662	(60) VENEZUELA 61

Source: *World Competitiveness Yearbook, 2006*

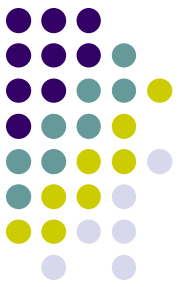
The Differences Between the GCI and the WCS



- In spite of the great similarities, some methodological differences arise. The first one is about the “pillars” of competitiveness:

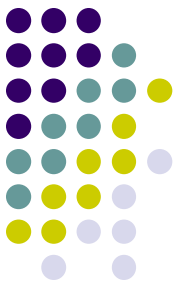
- | | |
|----------------------------------|--------------------------|
| ● GCI: | ● WCS |
| 1. Institutions | 1. Economic performance |
| 2. Infrastructure | 2. Government efficiency |
| 3. Macroeconomics | 3. Business efficiency |
| 4. Health and Basic Education | 4. Infrastructure |
| 5. Higher Education and Training | |
| 6. Market efficiency | |
| 7. Technological readiness | |
| 8. Business sophistication | |
| 9. Innovation | |

The Differences Between the GCI and the WCS (2)



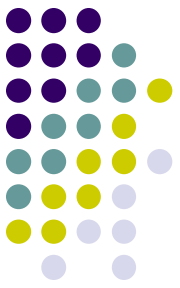
- One interesting feature of the CGI is that the weights of each pillar are different according to the stage of development (for example, countries that are at the factor-driven stage, according to their per capita income, have the 4 first pillars – the basic requirements - over-weighted). Alternatively, the WCS attributes 25% for each sub-index.
- Another feature of this index is that it takes into account more variables related to innovation.
- But the most interesting feature of the WCS is that some countries' most dynamic regions, such as the State of Sao Paulo in Brazil, are analyzed separately.

Strengths and weaknesses of this approach



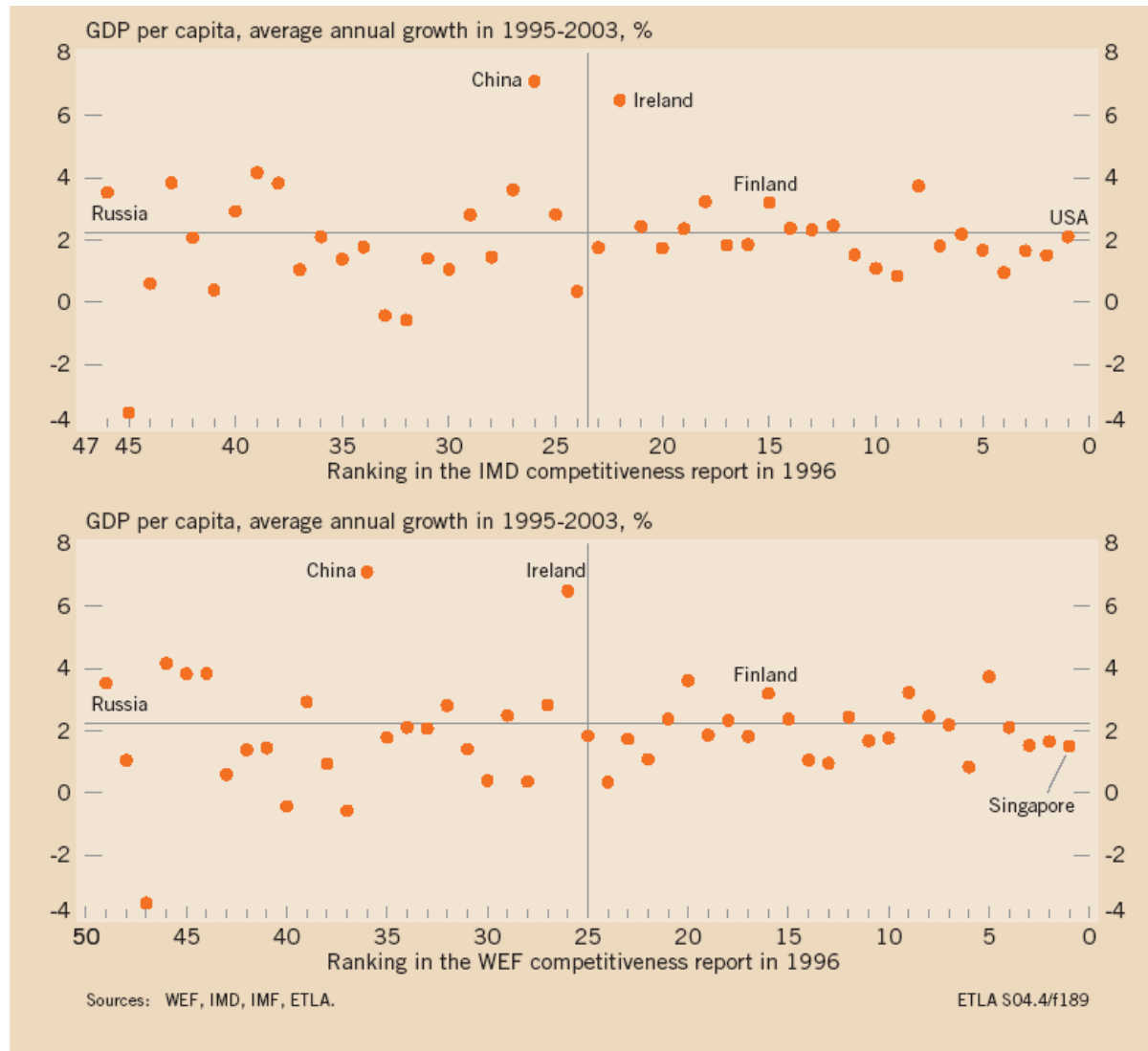
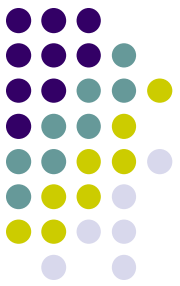
- The main strength of the GCI and WCS is that they provide a comprehensive but easy and straightforward indicator of *ex-ante* competitiveness, comparable between countries and which can be very useful for benchmarking policies and its outcomes.
- But there are some weaknesses, three of them practical ones and two of theoretical nature.

Practical weakness n. 1: Do they measure growth competitiveness?

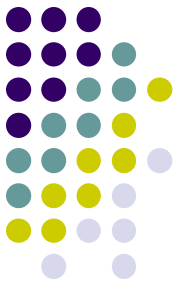


- The answer is, incredibly, no. For example, there is no correlation between the rank at the GCI and observed GDP growth, even in the long run.
- Perhaps these indexes are more related to the risk of doing business, or, at some extent, with the level of development (see, for instance, the top 10 list). But even it is the case, there are some surprises, that are strongly related to the next 2 weaknesses: countries switch a lot their positions and - maybe because of it – conjuncture influences a lot in the classification.

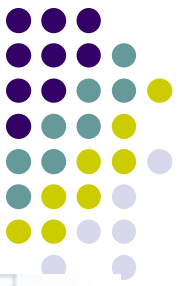
Correlation between the GCI and WCS and observed growth, 1995-2003



Practical weakness n. 2: Countries switch a lot their positions

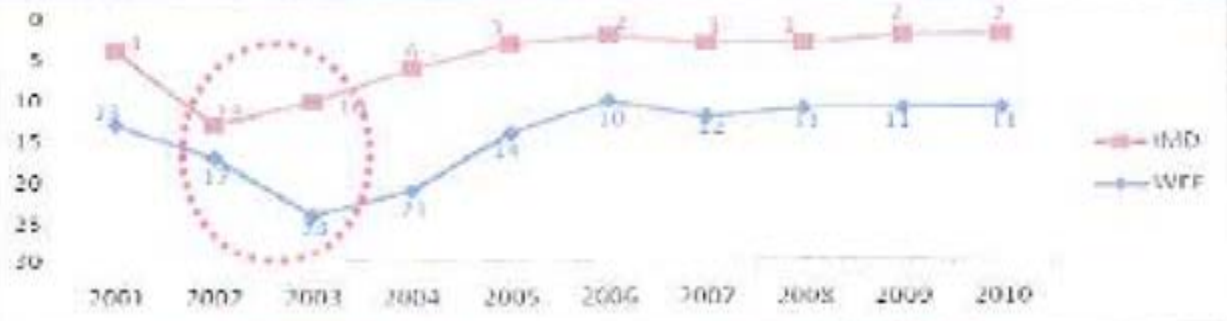


- If competitiveness is understood as a structural concept, then strong changes at the rankings should not happen. Very often countries switch 10 positions within a year period (for instance, Brazil's GCI is in 66st position in 2006, but was in the 57st last year and in the 44st in 2001, basically the same happened with Egypt and Colombia).

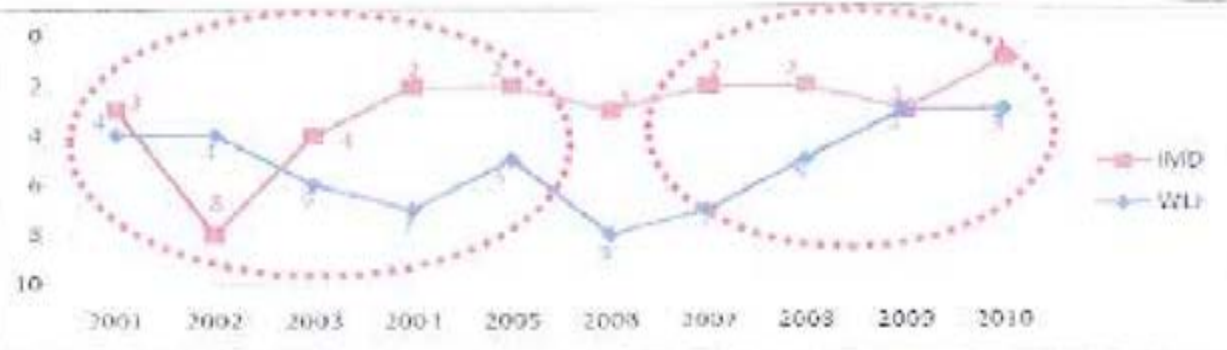


Some examples...

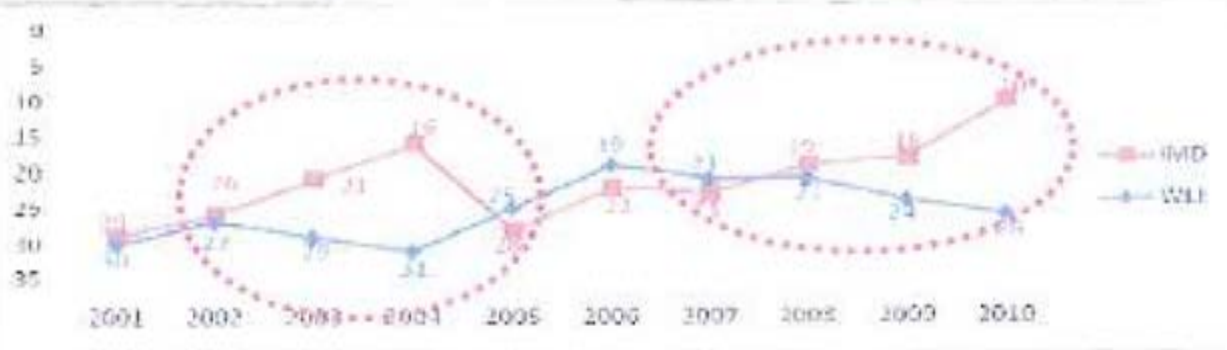
Hong Kong



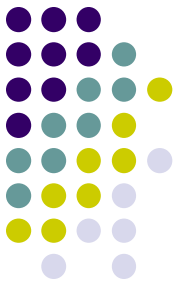
Singapore



Malaysia

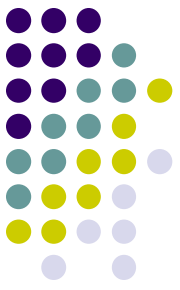


Practical weakness n. 3: Conjuncture affects a lot



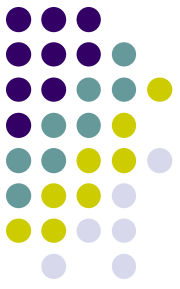
- Maybe this is the main reason why countries switch their classifications so much. For instance, this year champion at the Macroeconomic Pillar was Algeria, followed by Kuwait, Qatar and United Arab Emirates, just because the rise of the oil prices.

Theoretical weakness n. 1: Do the base indicators reflect competitiveness?



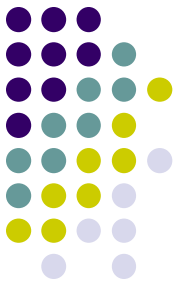
- Some of the base indicators used to calculate the competitiveness indexes do not capture the dynamics of the phenomenon. For example, trade and fiscal balances must be analyzed according to an intertemporal framework, and not only by a quick assessment of deficits or surpluses in a given year. Specifically about the trade balance, the year-by-year analysis leads to a mercantilist assessment of competitiveness.

Theoretical weakness n. 2: How can pre-conditions be translated into growth?



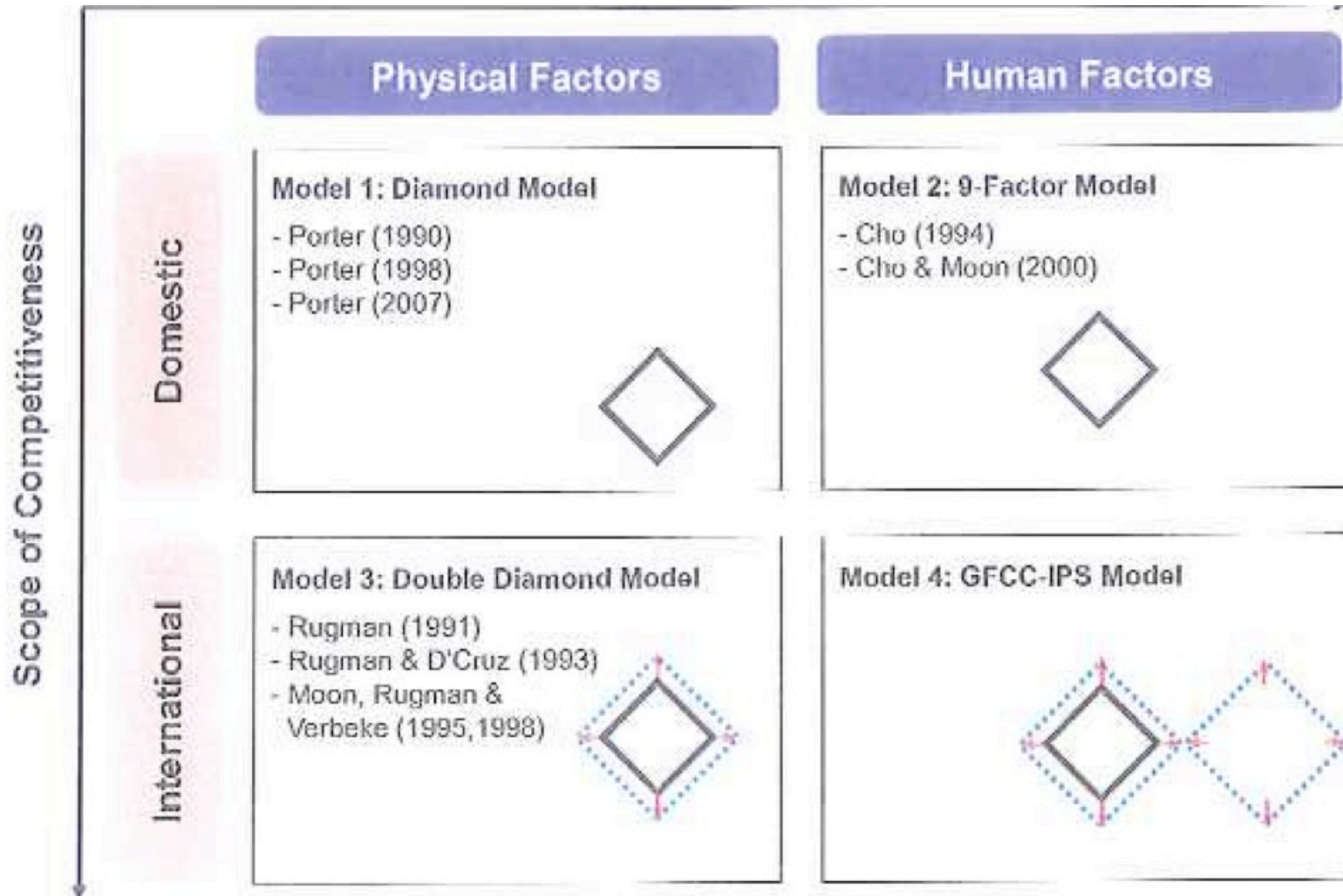
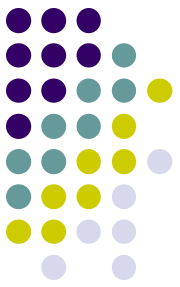
- According to Porter's view, sometimes initial factors disadvantages are the main motivation to firms innovate and overcome these difficulties. Additionally, the size of the market loses a lot of its relevance if consumers are not quality demanding and do not pressure companies to innovate in order to respond to their needs.
- This is the main problem of the *ex-ante* competitiveness measures: pre-conditions do not necessarily become actual growth.

The Korean proposal (Cho, Moon and Kim, 2008)

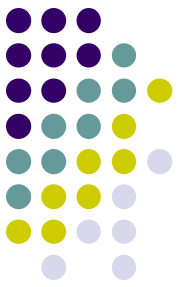


- Theoretical background: The Dual Double Diamond
- Eight factors:
 - Physical factors: Factor conditions, Business Context, Related and Supporting Industries, Demand Conditions
 - Human Factors: Workers, Politicians and bureaucrats, Entrepreneurs, Professionals

Evolution of competitiveness diamonds



The MASI Approach: Measurement



General Prescription

(Methodology 1)

Model 1

$$Y_{1t} = \sum_{i=1}^7 (X_{i,t}, Y_{t-1})$$

Specific Prescription

(Methodology 2)

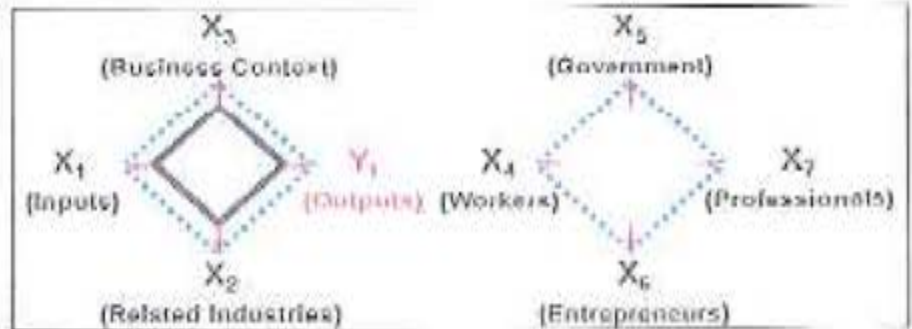
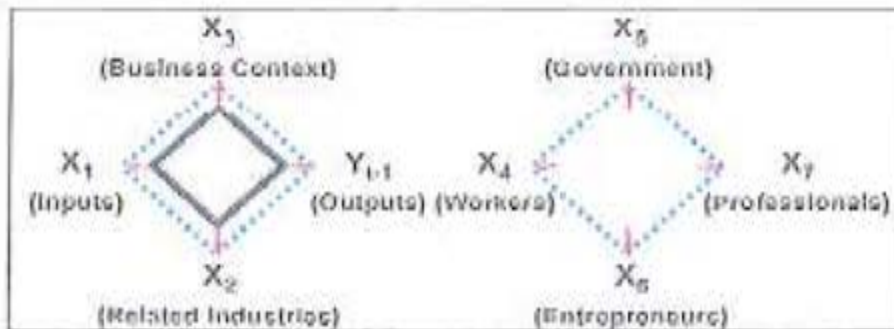
Model 2

$$Y_{2t} = f(X_{i,t})$$

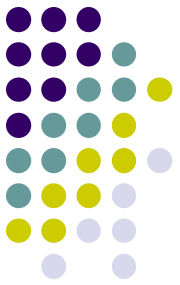
$$= Y_{2a} = f(X_{1,t})$$

$$= Y_{2b} = f(Z_{1,t})$$

$$= Y_{2c} = f(Z_{2,t})$$



Y_{2a} : Employment; Y_{2b} : GDP growth; Y_{2c} : Quality of life



The MASI Approach: Analysis

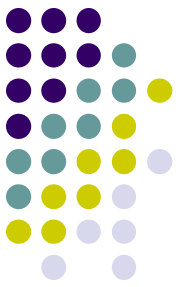
Overall Ranking

Rank	Country	NCI
1	Singapore	65.51
2	United States	61.72
3	Canada	61.27
4	Sweden	59.98
5	Hong Kong	59.89
6	Denmark	59.04
7	Switzerland	59.48
8	Netherlands	59.11
9	Australia	58.70
10	Finland	55.85
11	Israel	55.65
12	Belgium	54.19
13	Germany	52.02
14	Austria	51.88
15	China	51.84
16	United Kingdom	51.39
17	Taiwan	49.77
18	New Zealand	48.84
19	Korea	48.74
20	France	48.01
21	Iceland	47.28
22	India	45.68

Rank	Country	NCI
23	Japan	45.40
24	Italy	45.06
25	U.A.E.	44.74
26	Thailand	43.37
27	Jordan	42.91
28	Hungary	42.73
29	Poland	42.63
30	Spain	42.46
31	Philippines	42.44
32	Kuwait	41.92
33	Panama	40.54
34	Chile	40.12
35	Czech Republic	39.24
36	Saudi Arabia	39.10
37	Indonesia	38.55
38	Malaysia	37.90
39	Mexico	37.56
40	Oman	37.37
41	Vietnam	37.18
42	Brazil	36.54
43	Russia	35.92
44	Dominican Republic	35.84

Rank	Country	NCI
45	Egypt	35.59
46	Greece	35.56
47	Colombia	34.93
48	Guatemala	33.22
49	Turkey	33.11
50	Nigeria	33.00
51	Morocco	32.97
52	Peru	32.15
53	Bangladesh	32.04
54	South Africa	32.00
55	Cambodia	31.31
56	Pakistan	30.43
57	Croatia	30.18
58	Kyrgyz Republic	28.99
59	Argentina	28.60
60	Ukraine	27.82
61	Kenya	27.77
62	Iran	25.12
63	Venezuela	25.00
64	Sri Lanka	24.14
65	Libya	21.84

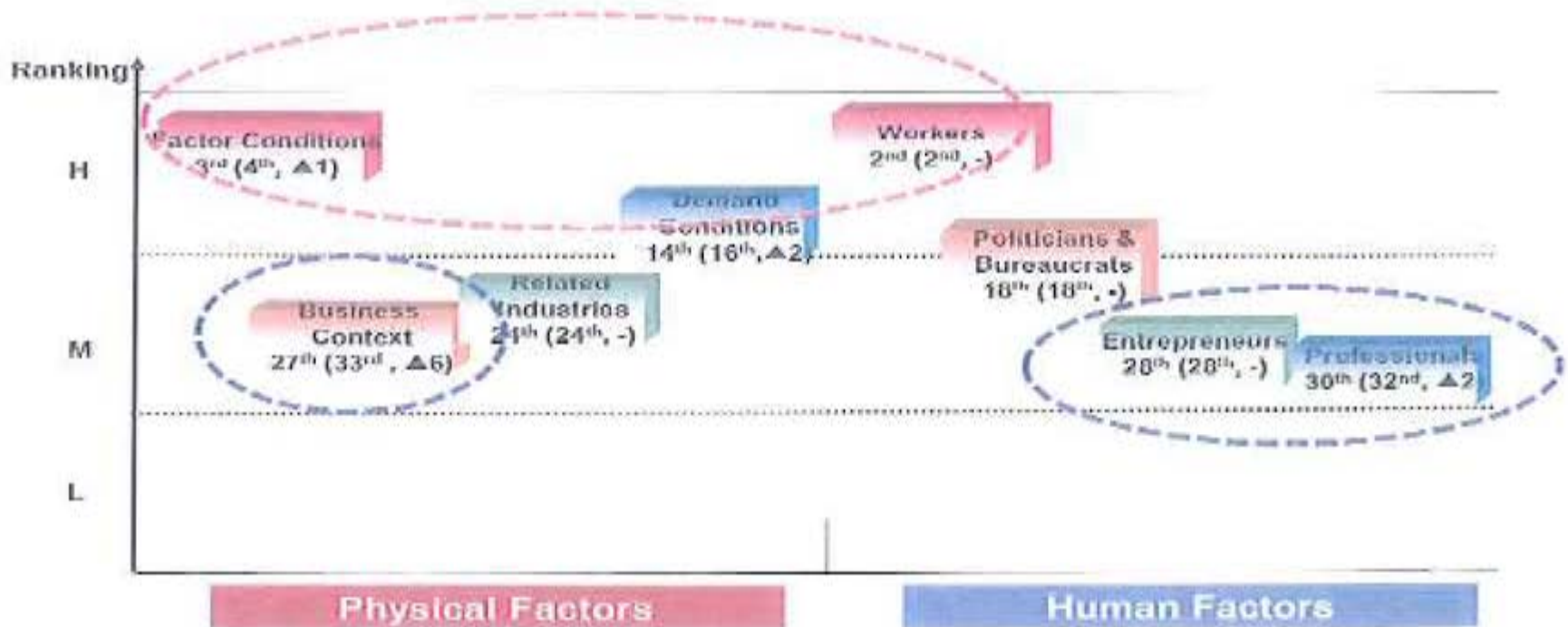
* NCI: National Competitiveness Index



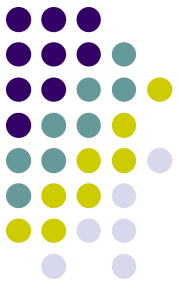
The MASI Approach: Analysis

The Chinese Case

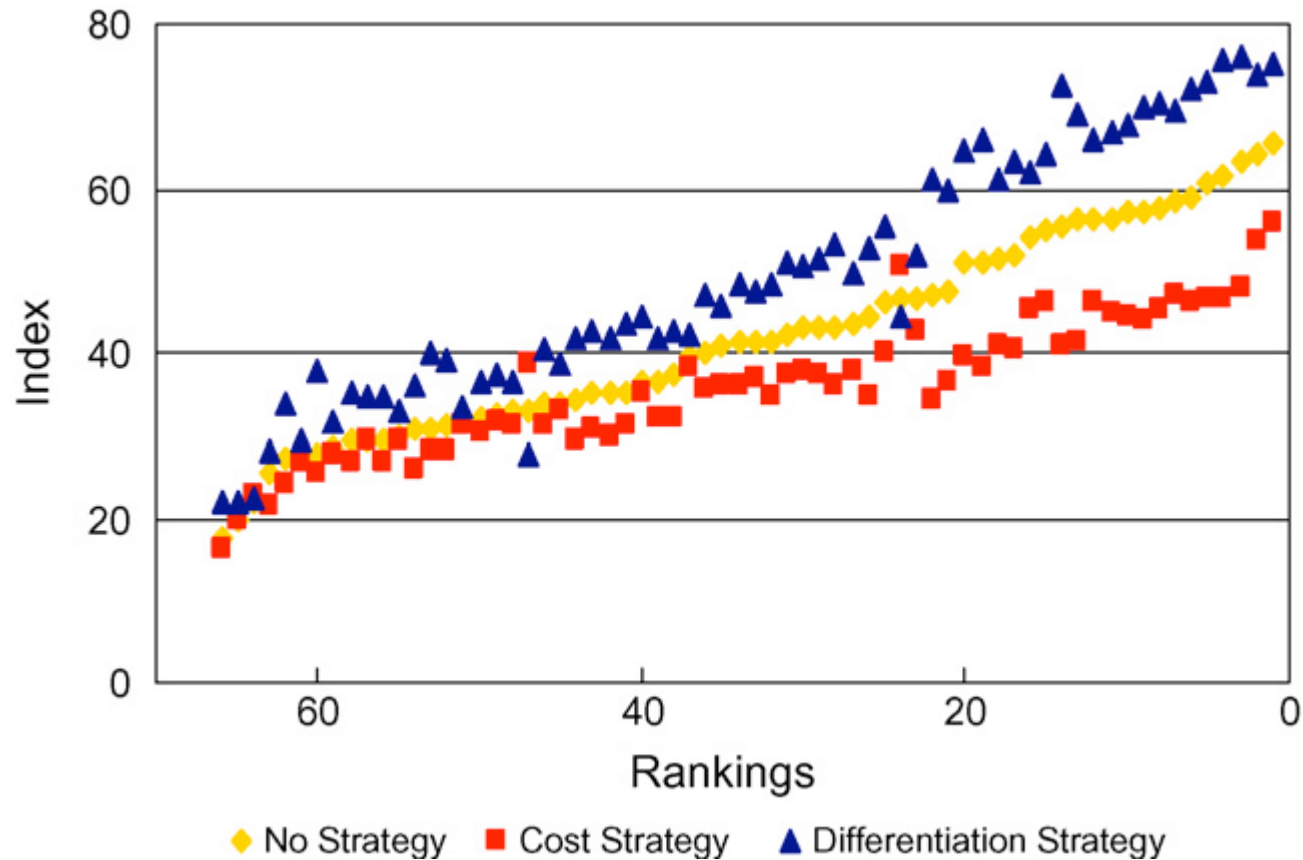
Factor Ranking: **China Case***



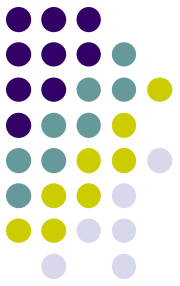
The MASI Approach: Simulation



Different strategies (cost strategy, differentiation strategy) may provide different competitiveness indexes

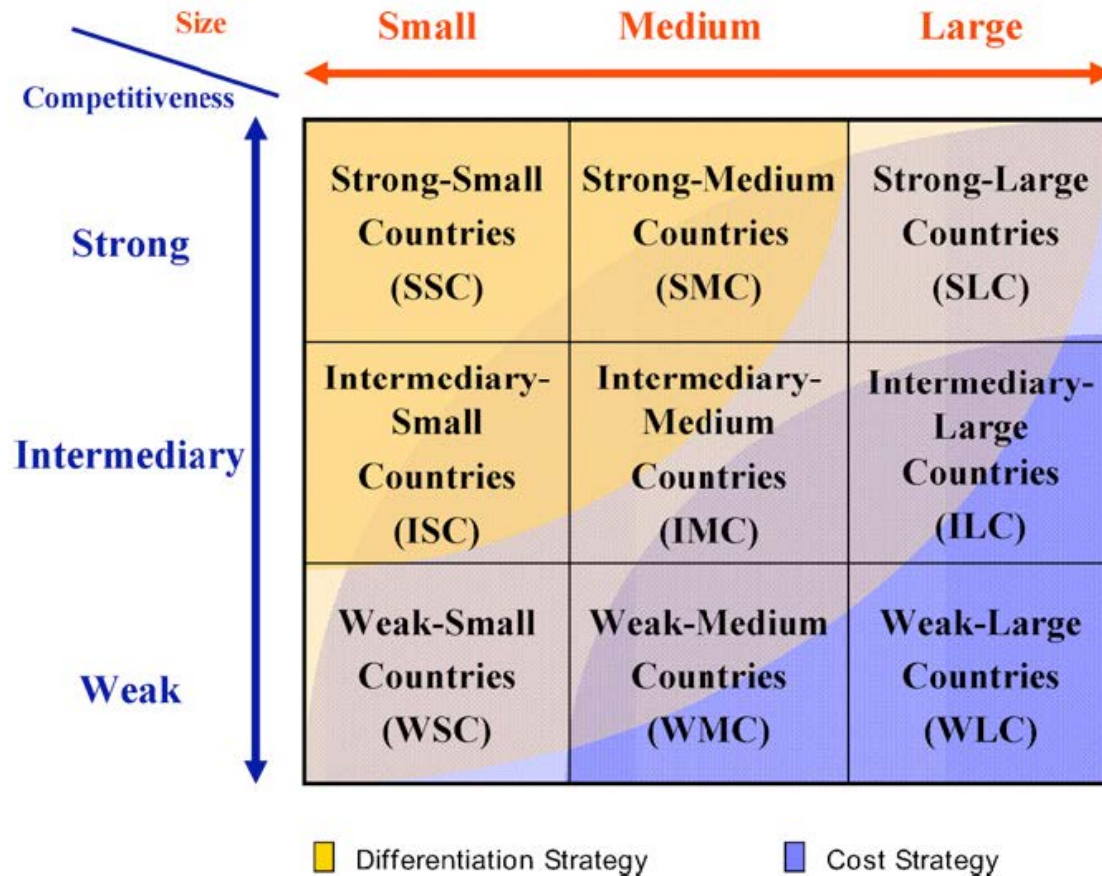
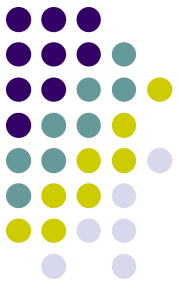


The MASI Approach: Implementation

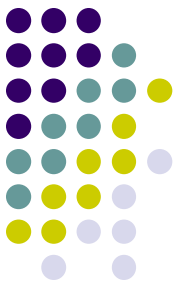


	CSI-NSI ^a	DSI-NSI ^b
Size		
Pearson correlation	0.375**	-0.394**
Sig. (two-tailed)	0.002	0.001
<i>N</i>	66	66
Competitiveness (NSI ^c)		
Pearson correlation	-0.843**	0.695**
Sig. (two-tailed)	0.000	0.000
<i>N</i>	66	66

The MASI Approach: Implementation



The MASI Approach: Implementation

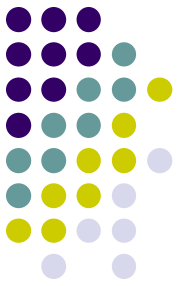


Factor \ Stage		Stage		
		Developing	Transitional	Developed
Physical Factors	Factor Conditions	Resource-based	Manufacturing-based	Knowledge-based
	Business Context	Protectionism	Efficiency	Competition
	Related & Supporting Industries	Physical Infrastructure (Roads & Ports)	Industrial Cluster	Regional Integration
	Demand Conditions	Quantity	Quality	Sophistication

Factor \ Stage		Stage		
		Developing	Transitional	Developed
Human Factors	Workers	Cheap	Motivated	Skilled
	Politicians & Bureaucrats	Facilitation	Support & Regulation	Advice
	Entrepreneurs	Risk Taking	Efficiency Developing	Value Creating
	Professionals	Operational	Managerial	Strategic

Differentiation Strategy
 Cost Strategy

Towards an alternative approach



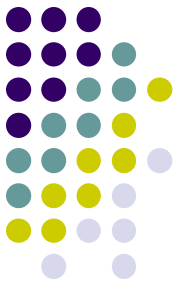
- Rather than substitute, we developed a methodology of industrial structure comparisons that is complementary to the *ex-ante* analysis: we analyze competitiveness and more precisely the firms' competitive strategies in an *ex-post* way, based on innovation and industrial surveys.
- This kind of analysis is completely a new one.

The firms' competitive strategies approach: why?



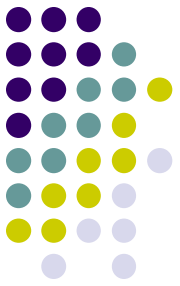
- Remember that the very nature of competitive advantage relies on consistent innovation and product differentiation as a competitive strategy.
- But no country can be competitive in all industries, since not every firm can achieve the innovation-based pattern of competition. Moreover, the competitive strategies of the firms must be related to the nations' stage of development.

The firms' competitive strategies approach: what is it?



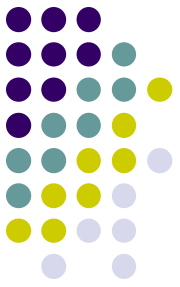
- So, we created a classification that allows us distinguish and analyze, through key variables and indicators, three competitive strategies:
 1. Firms that reacted proactively during the nineties, investing on innovation and product differentiation as a competitive strategy;
 2. Firms that made a partial adjustment of production processes in order to face the international competition (mainly investing on purchases of capital goods and so innovating in processes);
 3. and those that are less innovative and productive, which survive in a smaller scale and exploiting local markets, mainly through low costs of labor.

The firms' competitive strategies approach: what is it? (2)



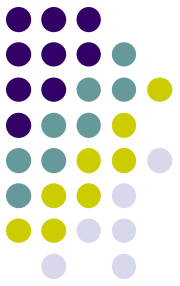
- Note that within a country the three kinds of firms coexist and interact with each other. So if on the one hand that's not easy to create a single score and ranking for the countries, on the other hand that's exactly where the richness of the approach relies upon.
- We can point out strengths and weaknesses of each category of firms (specially the first two) and, specially, we can characterize their technological learning, cooperation and technical change and the corresponding short run outcomes. In this sense, our classification is rather dynamic and structural than static and conjuncture influenced.

The firms' competitive strategies approach: how is it made?



- In Brazil, we translated the competitive strategies into indicators in the following way:
 - A. Firms that innovate and differentiate products:**
 - i. Firms that innovate new products to the national markets according to the Brazilian Manufacturing Innovation Survey, and
 - ii. export and earn a export price 30% higher than the rest of Brazilian exporter of that product.
 - B. Firms that are specialized in standardized products**
 - i. The rest of the exporters - because exports are a good proxy for a successful adaptation to the competitive environment, or
 - ii. non-exporters that have higher productivity than the exporters in its industrial sector – because exporting involves sunk costs and very competitive firms can be non-exporters.
 - C. Firms that do not differentiate products and have a lower productivity**
 - i. Firms that did not fall in the above categories.

The firms' competitive strategies approach: how is it made? (2)



- However, in order to make international comparisons available, we had to change a bit the criteria to reclassify the “A” firms, since we did not have how to assess the differentiated export prices. So, the resulting classification was:
 - x. **Firms that innovate and differentiate products:**
 - i. Firms that innovate new products to the national markets according to Innovation Surveys, and
 - ii. invest more than the sectoral average in R&D/total revenue (following a common criterion between the countries for the sectoral averages).
 - y. **Firms that are specialized in standardized products**
 - i. The rest of the exporters, or
 - ii. non-exporters that have higher productivity than the exporters in its
 - iii. industrial sector.
 - z. **Non-innovative firms that have a lower productivity**
 - i. Firms that did not fall in the above categories.

Brazilian firms' profile according to the competitive strategies (2000)



	Total of firms (share of the total in par.)	Employees (share of the total in par.)	% of country's total sales	% of country's exports (av. exp. coef. in par.)	Productivity (USD1000/worker/year)
Innovate and differentiate their products	721 (4.58%)	924 (17.64%)	25.19%	33.16% (0.17)	118,21
Specialized in standardized products	6,066 (38.55%)	325 (52.35%)	64.19%	66.83% (0.15)	102,77
Do not differentiate products and have lower productivity	8,949 (56.87%)	126 (30,00%)	9.80%	-	27,06
Total	15,737	3,776,499	100%	100%	82,78

Argentinean firms' profile according to the competitive strategies (2001)



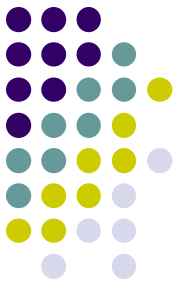
	Total of firms (share of the total in par.)	Employees (share of the total in par.)	% of country's total sales	% of country's exports (av. exp. coef. in par.)	Productivity (USD1000/worker/year)
Innovate and differentiate their products	242 (6.06%)	240 (9.48%)	12.71%	12.75% (0.23)	160.800
Specialized in standardized products	2,064 (56.34%)	188 (64.67%)	80.11%	87.25% (0.30)	148.306
Do not differentiate products and have lower productivity	1,357 (37.04%)	118 (25.85%)	7.61%	-	33.198
Total	3,663	639,984	100%	100%	119,725

Mexican firms' profile according to the competitive strategies (2000)



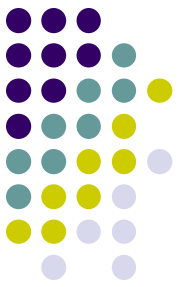
	Total of firms (share of the total in par.)	Employees (share of the total in par.)	% of country's total sales	% of country's exports (av. exp. coef. in par.)	Productivity (USD1000/worker/year)
Innovate and differentiate their products	263 (3.23%)	385 (5.29%)	5.30%	3.48% (0.22)	98,191
Specialized in standardized products	4,179 (51.29%)	288 (62.75%)	82.70%	96.52% (0.52)	129,099
Do not differentiate products and have lower productivity	3,705 (45.48%)	165 (31.96%)	11.99%	-	36,672
Total	8,147	1,918,942	100%	100%	97,83

Some comments on the results



- In all of the Latin American countries firms that are specialized in standardized products have the largest share of exports, total employment and sales.
- Notwithstanding, in Brazil innovating and product-differentiating firms have a larger share of employment, sales and manufacturing than in the other countries.
- In Mexico, the specialization towards the standardized products is so strong that firms that are specialized in these products are in fact more productive than those that invest in product differentiation as a competitive strategy.
- Now, let us take a look at some technological indicators.

Brazilian innovative efforts: the case of R&D (2000)



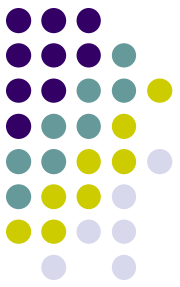
	R&D/Total sales	Emp. at R&D	% of total staff
Innovate and differentiate their products	1.40	30.67	3.31%
Specialized in standardized products	0.36	3.60	1.10%
Do not differentiate products and have lower productivity	0.36	0.97	0.76%
Industry totals	0.61	3.34	1.39%

Argentinean innovative efforts: the case of R&D (2001)



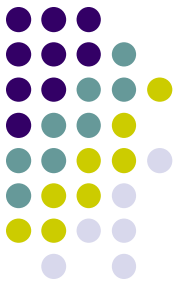
	R&D/Total sales	Emp. at R&D	% of total staff
Innovate and differentiate their products	1.08	7.93	3.29%
Specialized in standardized products	0.08	3.00	1.59%
Do not differentiate products and have lower productivity	0.15	1.43	1.20%
Industry totals	0.21	2.75	1.65%

Mexican innovative efforts: the case of R&D (2001)



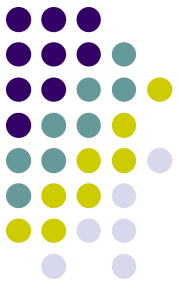
	R&D/Total sales	Emp. at R&D	% of total staff
Innovate and differentiate their products	0.81	7.14	1.79%
Specialized in standardized products	0.04	1.19	0.41%
Do not differentiate products and have lower productivity	0.06	0.43	0.26%
Industry totals	0.08	1.04	0.44%

Some comments on the results

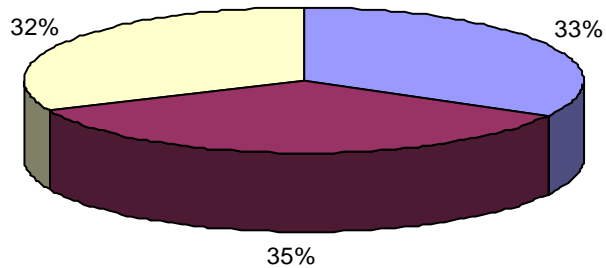


- In all of the Latin American countries innovative efforts are considerably low. For the sake of comparison, in Germany the R&D/Industrial sales indicator is 2.7% and in France it is 2.5%.
- In Brazil, we have more people employed in R&D in each firm, but the % of total employees as a proportion of the total staff is not so different than in Argentina because of the larger scale of Brazilian firms.
- In Mexico the R&D/industrial sales indicator reaches the lowest value: only 0,08%, which clearly illustrates the competitive strategy of Mexican firms (Note: the Mexican Innovation Survey **did not** interview the Maquila firms).
- Now let us take a look on how the innovative expenditures are distributed.

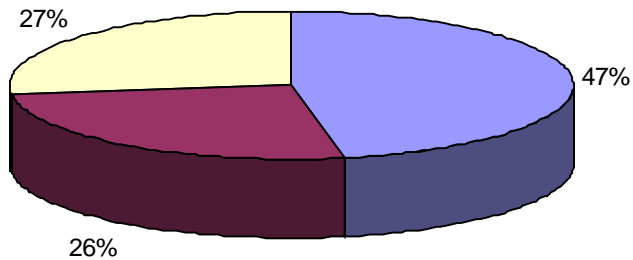
Brazilian firms' innovation expenditures distribution (2000)



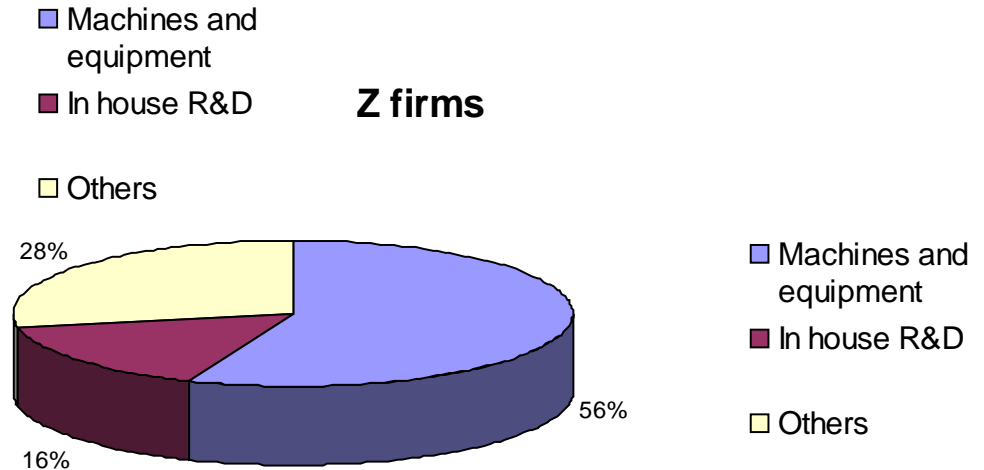
X firms



Y firms

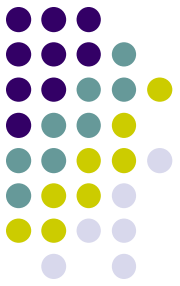


Z firms

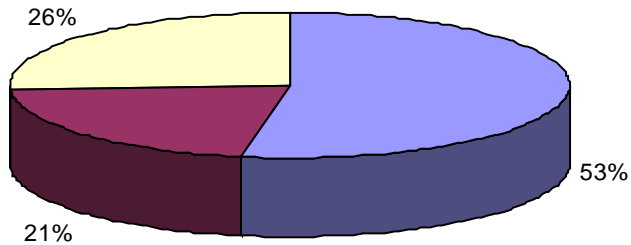


- Machines and equipment
- In house R&D
- Others

Argentinean firms' innovation expenditures distribution (2001)

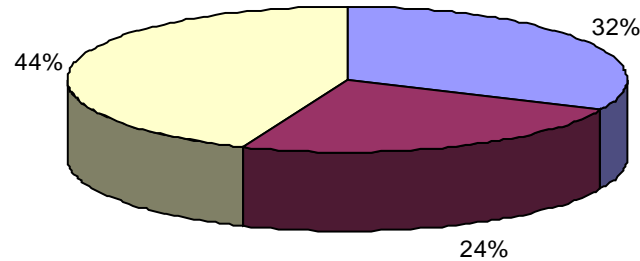


X firms



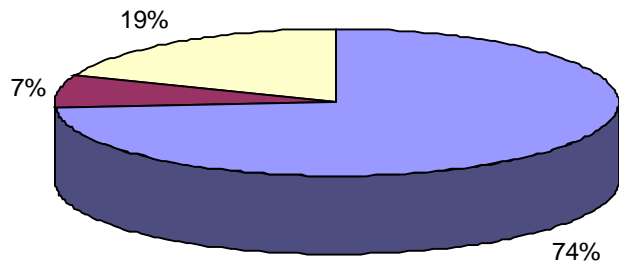
- Machines and equipment
- In house R&D
- Others

Z firms



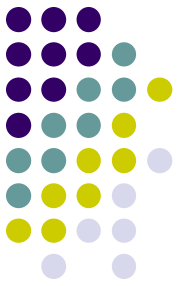
- Machines and equipment
- In house R&D
- Others

Y firms

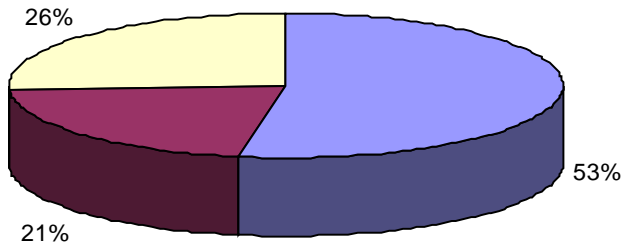


- Machines and equipment
- In house R&D
- Others

Mexican firms' innovation expenditures distribution (2000)

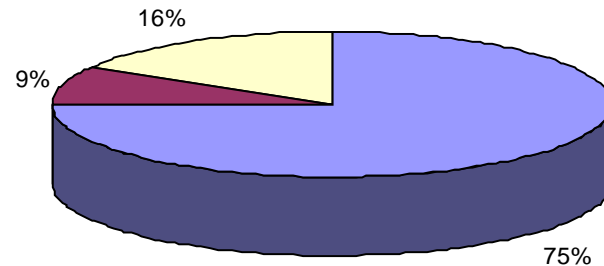


X firms



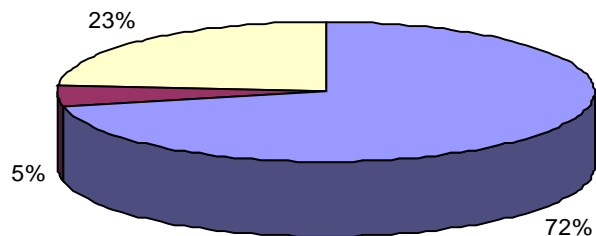
- Machines and equipment
- In house R&D
- Others

Z firms



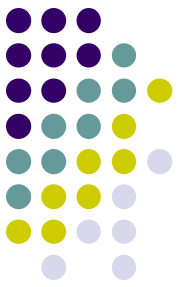
- Machines and equipment
- In house R&D
- Others

Y firms

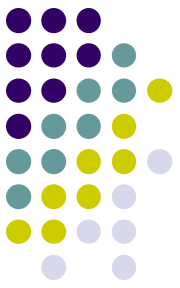


- Machines and equipment
- In house R&D
- Others

Some comments on the results

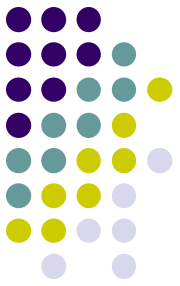


- In all of the Latin American countries innovative efforts are biased towards the acquisition of machines and other equipments related to process innovation. For the sake of comparison, in Spain the in house R&D is the most important category of innovative effort: for example, the X firms in Spain spend 58% of the innovation bill in this kind of innovative effort, the similar figures for the Y and Z are 40% and 64%, respectively (preliminary results).
- In Mexico, this pattern is much stronger, one more evidence of the Mexican technological and competitive strategy.



(Possible) Future steps

- Our team already classified and analyzed, according to the presented methodology, the industrial structures from Brazil, Argentina and Mexico. These results will be presented in two books.
- We are ready to start a benchmarking work with advanced economies, such as USA, Canada, Germany, Switzerland, France and Spain.



Thank you very much!!!

ipea



USP