defining the WCU

- self-declaration
- reputation
- rankings
中华人民共和国教育部战略研究中心

Center for World-Class Universities
top 50 universities (2012)

**ARWU 2012**
- USA, 36
- WESTERN EUROPE, 5
- UK, 5
- CANADA, 2
- JAPAN, 2

**ARWU 2011**
- USA, 29
- WESTERN EUROPE, 4
- CANADA, 3
- OTHER ASIA, 4
- USA, 29

**THE 2012-13**
- USA, 36
- WESTERN EUROPE, 4
- CANADA, 3
- OTHER ASIA, 4
- UK, 7
- JAPAN, 1
- AUSTRALIA, 2
Characteristics of a World-Class University
Alignment of Key Factors

- Students
- Teaching Staff
- Researchers

- Top Graduates
- Leading-Edge Research
- Dynamic Knowledge & Technology Transfer

- Public Budget Resources
- Endowment Revenues
- Tuition Fees
- Research Grants

- Autonomy
- Academic Freedom
- Leadership Team
- Strategic Vision
- Culture of Excellence

Source: Elaborated by Jamil Salmi
concentration of talent

- teachers and researchers
- incoming students
- undergraduate / graduate students
### Weight of Graduate Students

<table>
<thead>
<tr>
<th>University</th>
<th>Undergraduate Students</th>
<th>Graduate Students</th>
<th>Share of Graduate Students (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard</td>
<td>7,002</td>
<td>10,094</td>
<td>59</td>
</tr>
<tr>
<td>Stanford</td>
<td>6,442</td>
<td>11,325</td>
<td>64</td>
</tr>
<tr>
<td>MIT</td>
<td>4,066</td>
<td>6,140</td>
<td>60</td>
</tr>
<tr>
<td>Oxford</td>
<td>11,106</td>
<td>6,601</td>
<td>37</td>
</tr>
<tr>
<td>Cambridge</td>
<td>12,284</td>
<td>6,649</td>
<td>35</td>
</tr>
<tr>
<td>LSE</td>
<td>4,254</td>
<td>4,386</td>
<td>51</td>
</tr>
<tr>
<td>Beijing</td>
<td>14,662</td>
<td>16,666</td>
<td>53</td>
</tr>
<tr>
<td>Tokyo</td>
<td>15,466</td>
<td>12,676</td>
<td>45</td>
</tr>
</tbody>
</table>
concentration of talent

- teachers and researchers
- incoming students
- undergraduate / graduate students balance
  - but involving undergraduate students in research
- international dimensions
international dimensions

• foreign faculty
  – Caltech (37%), Harvard (30%), Oxford (36%), ETH Zürich (60%)

• foreign students
  – Harvard (19%), Cambridge (18%)
abundant resources

• government funding
  – US able to spend 3.3% of GDP ($54,000 per student) – 1/3 public 2/3 private
  – Europe (E25) only 1.3% ($13,500 per student)

• endowments
### Comparison of US and UK Endowment Levels

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Harvard University</td>
<td>25,662</td>
<td>Cambridge</td>
<td>6,327</td>
</tr>
<tr>
<td>Yale University</td>
<td>16,327</td>
<td>Oxford</td>
<td>5,767</td>
</tr>
<tr>
<td>Stanford University</td>
<td>12,619</td>
<td>Edinburgh</td>
<td>264</td>
</tr>
<tr>
<td>Princeton University</td>
<td>12,614</td>
<td>Manchester</td>
<td>204</td>
</tr>
<tr>
<td>University of Texas</td>
<td>12,163</td>
<td>Glasgow</td>
<td>164</td>
</tr>
</tbody>
</table>
### Comparison of US and UK Endowment per Student

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Princeton University</td>
<td>1,667,000</td>
<td>Cambridge</td>
<td>343,934</td>
</tr>
<tr>
<td>Yale University</td>
<td>1,408,000</td>
<td>Oxford</td>
<td>283,670</td>
</tr>
<tr>
<td>Harvard University</td>
<td>1,209,000</td>
<td>Edinburgh</td>
<td>9,298</td>
</tr>
<tr>
<td>Stanford University</td>
<td>824,000</td>
<td>Glasgow</td>
<td>6,952</td>
</tr>
<tr>
<td>University of Texas</td>
<td>239,000</td>
<td>Manchester</td>
<td>5,208</td>
</tr>
</tbody>
</table>
abundant resources

- government funding
- endowments
- tuition fees
- research funding
funding features of case studies

• 8 out of 11 are public institutions

• endowments
  – Pohang: 2 billion $
  – NUS: 1 billion $
  – Monterrey Tech: 1 billion $
  – SJTU 120 million $
favorable governance

- freedom from civil service rules (human resources, procurement, financial management)
- management autonomy
  - flexibility and responsiveness with power to act
- selection of leadership team
- independent Board with outside representation
U. Of Malaya vs. NUS

- talent

  - UM: selection bias in favor of Bumiputras, less than 5% foreign students, few foreign professors
  - NUS: highly selective, 43% of graduates students are foreign, many foreign professors
U. Of Malaya vs. NUS (II)

- finance
  - UM: $385 million, $14,000 per student
  - NUS: $1 billion endowment, $1,200 million, $39,000 per student
U. Of Malaya vs. NUS

- governance
  - appointment of VC highly political in Malaysia: 10 VCs until 2008 (Prime Minister statement)
  - more professional in Singapore (5 VCs)
  - UM: restricted by government regulations and control, unable to hire top foreign professors
  - NUS: status of a private corporation, able to attract world-class foreign researchers
    - 52% of professors (9% from Malaysia)
    - 79% of researchers (11% from Malaysia)
Creating the Solar Energy Research Institute in Singapore

NUS Solar Energy Research Institute: Taking the lead in solar energy research and development
outline of the presentation

• defining the world-class university

• the road to academic excellence
the path to glory

• mergers
• upgrading existing institutions
• creating a new institution
mergers approach

China, Russia, France, Denmark, Finland

potential synergies

– 1+1=3

clash of cultures
upgrading approach

• less costly
• challenge of creating a culture of excellence
• focus on governance
"Whew! That was close! We almost decided something!"
creating a new institution

• KAUST, Nazarbayev University, Skolktech
• higher costs
• getting the right culture from the beginning
• creating a deep tradition of research
• academic freedom
which approach works best?

• upgrading and merging complicated
• establishing a new university from scratch potentially easier
who takes the initiative?

role of the State

- favorable regulatory framework
- funding
  - Excellence Initiatives
## # of excellence initiatives

<table>
<thead>
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<tbody>
<tr>
<td>Africa</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Asia &amp; Pacific</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Europe</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Middle East</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>North America</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
<td><strong>33</strong></td>
</tr>
</tbody>
</table>
### Regional Distribution of EIs

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>-</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Asia &amp; Pacific</td>
<td>Australia, China, Hong Kong, Japan, New Zealand, South Korea</td>
<td>China, India, Japan, Malaysia, Singapore, South Korea, Taiwan, Thailand</td>
</tr>
<tr>
<td>Europe</td>
<td>Denmark, Finland, Ireland, Norway</td>
<td>Denmark, France, Germany, Luxembourg, Poland, Russian Federation, Spain, Sweden</td>
</tr>
<tr>
<td>Middle East</td>
<td>-</td>
<td>Israel</td>
</tr>
<tr>
<td>North America</td>
<td>Canada</td>
<td>Canada</td>
</tr>
</tbody>
</table>
characteristics of EIs

• focus on entire institutions or individual departments / centers?
• allocation method: competitive or picking winners?
• focus on young researchers?
• involvement of international experts in selection of winners?
characteristics of EIs

- financial stability over the years
  - crisis (Japan and Spain)
  - phased programs
  - endowment (France)

- scholarship programs (Brazil, Chile, Kazakhstan, Saudi Arabia)
who takes the initiative? (II)

- role of the institutions
  - leadership
  - strategic vision
  - culture of excellence
Oulu
OULUN KAUPUNKI
City of Oulu
OULUN YLIOPISTO
University of Oulu
evolution of Nokia income
outline of the presentation

• defining the world-class university
• the road to academic excellence
• lessons of experience
vintage bias
accelerating factors

• internationalization
research capacity: EU research grants by country of host institutions per 1 million inhabitants

- Greece: 0.3
- Ireland: 0.5
- Finland: 1.4
- Portugal: 2.0
- Switzerland: 2.3
- Cyprus: 2.6
international dimensions

- reliance on Diaspora (Pohang, HK, SJTU, Cyprus)
international dimensions

- reliance on Diaspora (Pohang, HK, SJTU, Cyprus)
- foreign or foreign-trained academics
- foreign partners (new universities)
  - creation of original institutional culture (KAUST, Nazarbayev U)
- English language (all or many)