Modest flow of research projects to, and from, most developing countries, 2003–2014

Most manufacturing firms active in innovation not collaborating with academia

Finding of innovation survey by UNESCO Institute for Statistics (2013) of:
• 31 high-income countries
• 22 medium- and low-income countries

Few innovation-active firms have linkages to universities (% of firms)

Obstacles to collaboration

Company perspective
Firms prefer in-House R&D to outsourcing (e.g. Rep. Korea, China, France, Costa Rica, Argentina, Malaysia)
Internal sources of information valued most (e.g. Australia, Colombia, Israel, Mexico, Norway)

Protectionism: lack of competition discourages industrial innovation (e.g. Argentina, Brazil, Russian Fed.)
Firms in resource-based economies can import sophisticated technologies during commodities boom (e.g. Brazil, Russian Fed.)

Lack of finance:
* low foreign direct investment in R&D (see map), design and testing,
* lack of venture capital for start-ups, etc.

High cost of innovation: lack of modern infrastructure, red tape, poor intellectual property protection, etc. (e.g. Brazil, Russian Fed.)

University perspective
Lack of incentives to work with industry:
* publish or perish valued over patents for career advancement
* donor dictates research focus (e.g. Tanzania)

Lack of financial and administrative autonomy (e.g. Afghanistan)
Its unpredictable nature makes transfer an unreliable supplement to university’s revenue, unlike government research grants, tuition fees, etc. (e.g. USA)

Enablers of collaboration

Financial incentives
Doctoral fellowship doubled for students whose thesis topic is initiated by student’s industrial partner (Government of India/ Government of Japan/financial institutions/private firms, 2012)

When university start-ups yield a profit, part returns to national treasury (Government of Japan/financial institutions/private firms, 2014)

Fund to catalyse risk capital for start-ups, such as for frugal innovation (Government of India, 2014)

University may sell technologies developed under government-funded contracts to firms (Russian Fed., 2006)

Industry pays into tax fund for research in same industry (Malaysian Palm Oil Board, Brazilian sectoral funds, Moroccan National/Fund for R&D)

Changing the culture of governing bodies
Law creates governing board for universities, with half of members to come from outside, including private sector (Senegal, 2014)

Upscaling
Blending business and basic science: mega-business belt: heavy ion accelerator, basic science institute, 18 universities, science parks, public and private research centres (Rep. Korea)

International collaboration to create smart homes and cities (Moscow State University/Russian Venture Company/Chinese construction company, Chehaoda)

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KEY
Blue
Flows from traditionally R&D-intensive countries to ‘new’ countries in terms of R&D

Green
Flows from ‘new’ countries to traditionally R&D-intensive countries

Red
Flows between ‘new’ countries