Strenghening the industrial perspective in the ERA

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Outline

- Business ***shocks*** as an opportunity? Which shocks (Trajtenberg)? A Swedish shock?
- Strenghtening the industrial perspective in the ERA
  - Impact of the crisis on industrial research
  - Policy responses
- Crisis ***opportunities*** for European research and governance
- Global challenges: towards a new, emerging innovation paradigm?

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1. The crisis as business shocks?

- A double “squeeze”: a ***financial*** crisis having affected the ***real*** economy in a self-reinforcing way. Difficult to assess the precise bottoming out of such mutually reinforcing effects;
- A ***global*** economic recession which can not be addressed using traditional national tools; many of the large “systemic” banks no longer being in a position to carry out that function;
- Major ***stress*** on financial institutions following the massive asset write downs which resulted in a credit contraction that slowed GDP as less cash for investments was becoming available;
- Spreading of ***lack of trust*** in future risks both with private investors and more broadly with citizens: a fertile ground for financial nationalism leading to a contracting financial sector in most (small) countries.

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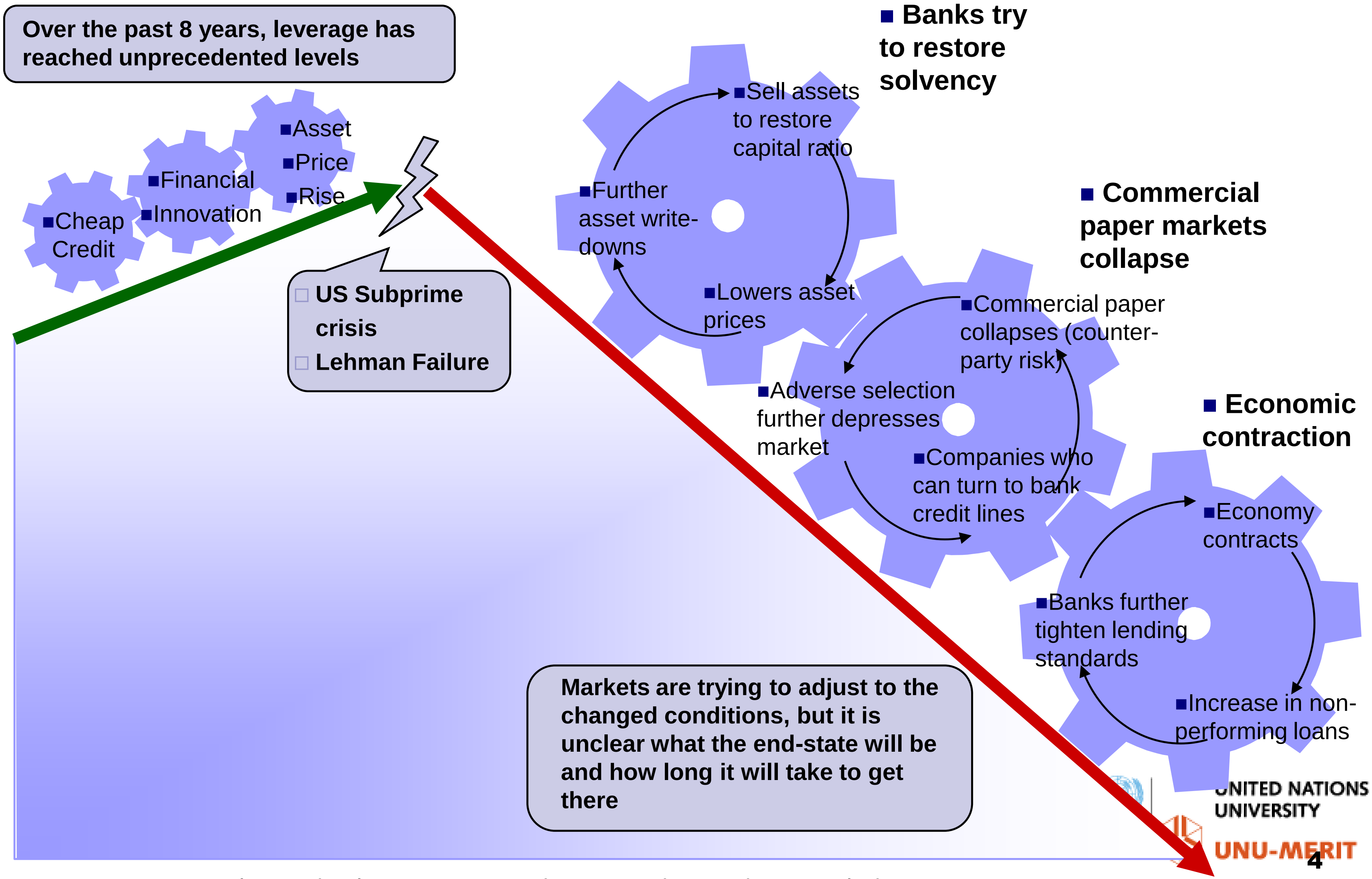
Mutually reinforcing effects



Source: Morgan Stanley; Federal Reserve; BEA; The Economist; McKinsey analysis

Scenarios

Capital Markets Crisis

Early Recovery

Balanced growth

- Recession 2 to 5 years, then strong recovery;
- Global financial flows become more balanced: growth in US and UK savings, reduction in reserves in China and S-E Asia
- New role for IMF;
- Stronger representation of emerging countries in international financial organizations;
- Growing international trade conflicts.

No change

- Recovery is rapid (3-4 quarters) and broad-based;
- New, effective regulatory regime, credit markets recover, safe leverage ratios;
- Limits to (un-)sustainable growth (oil price increases, raw materials) will be expressed in re-occurrence of crises in old and new areas (trade, finance but also health, migration, climate, etc.);
- Rising inequality resulting in unsustainable social exclusion, increased security costs.

Continued Slowdown

Disruption

- Recession more than 10 years;
- Long disruption period with globalization governed primarily by green concerns: priority on global implementation of environmental technologies;
- Significant slowdown in trade of goods, with severe structural unemployment and new specialization patterns emerging with high skill labour mobility;
- Shift from national technological competitiveness obsession to global knowledge diffusion.

Financial nationalism

- Recession lasting 1 to 2 years;
- Focus on protecting national savings, going for national and international “trust” investments (local banks and global “community” banks);
- Regional disparities with growing labour migration pressures;
- Financial global imbalances limit national growth opportunities;
- Trade and development imbalances limiting growth with strong local environmental problems.

Severe

Moderate

Economic Global Recession

2. Impact on industrial R&D

- Traditionally, one would view industrial R&D investments as evolving in an anti-cyclical way:
  - The negative impact of the recession on profitability forces firms to focus on the most productive segments of their output: the opportuntiy costs of achieving productivity growth is lower in recessions, providing incentives to undertake research activities in downturns (Aghion and Saint-Paul, 1998; Canton and Uhlig 1999);
  - R&D-personnel will be subject to “labour hoarding”; the most qualified scientists and engineers will be kept at the expense of lower skilled personnel.
- However, with respect to innovation, a cyclical view appears more likely:
  - Innovation or the implementation of new ideas, wil be postponed in a recession till the boom period (Shleiffer, 1986 and Francois and Lloyd-Ellis, 2003);
  - The so-called innovation acceleration hypothesis of Gerhard Mensch (1975) whereby radical innovation would be favoured in depressions out of despair remains subject to debate (Clark, Freeman and Soete, 1981).

Knowledge investment not part of recovery plans?

- As a result macro policy makers will often not consider supporting research, higher education and innovation a priority in addressing the crisis:
  - Priority goes to short term, demand led economic recovery plans as opposed to more long term structural reform plans such as R&D and human caoital investment support;
  - Given the counter-cyclical nature of research and productivity investments, the deeper the economic crisis, the quicker the structural transformation towards a knowledge economy. Thanks to the economic crisis, the EU might actually come nearer to its Lisbon and Barcelona targets in 2010!
  - While innovation will lag behind, there is little one can do about it... successful innovation is ultimately crucially dependent on entrepreneurial market expectations: it is endogenous to the business cycle.

Nature of the crisis

- The current dominant philosophy of "***Cash is king"*** has a direct ***negative*** impact on knowledge investments:
  - Within stock listed companies, there might be pressure to distribute as much of the limited profits as dividends – in a recession a crucial differentiating factor signalling solvability and management reputation. This pressure is likely to prevail over firms' long term R&D investment commitment;
  - Within SMEs as credit is becoming difficult to get, the focus shifts to organisational and easy to implement process innovations reducing costs and inventories. New, radical product innovations and renewal investments will be postponed;
  - Finally high-tech starters will postpone the introduction of new product innovations. As a result seed money providers are having difficulties in finding sufficient worthwhile investment proposals. The venture capital market collapses (see 2009 OECD report: -60%).

Policy responses

- On the supply side: national structural policy reforms in research:
  - Broadening of existing R&D support schemes for the private sector:
  - Complementary policies within broader trend of increased (global) specialisation of private R&D within large firms with a growing trend towards “outsourcing” in the direction of small firms.
  - Use opportunities for increased “outsourcing” of a number of specific R&D-activities in the direction of public sector (universities and other public research institutions); potential new role, with partly public (local) funding support for some of the large private R&D labs as “open” systemic innovation infrastructure;
  - Arguments similar to the support for systemic banks but with one major difference: not aimed at stabilisation but at enhancing growth dynamics. Example of dismantling of Bell Labs in the 80’s and impact on private R&D in US of many of those underutilized R&D managers.
- All nationally based...

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Policy responses (ctd)

- **On the demand side focus on sustainability:**
  - Fasten the development of various possible "***lead markets***" using technology procurement following the historical US examples of DARPA, NASA, NIH, etc.;
  - Involve the private sector more actively in technology development and innovation in societal innovation programmes (health, education, mobility and logistics, security);
  - Use the local growth and employment opportunities associated with the application and diffusion of green technologies to the full. E.g. "green" construction represents a long term productive investment both for the public and private sector, including house owners;
  - Focus the recognition of "grand challenges" on sustainable development. Use this new "mission" focus so as to bring about a brake in the current lack of trust with private investors and starters in future risk taking;
  - Make investments in sustainable investment shares and bonds fiscally more attractive.
- **All nationally based...**

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First conclusions: a less flat ERA after the crisis?

- Historically there have been continuous shifts in public versus private funding of research and innovation, sometimes in favour of public funding (2nd World War and post-war period), sometimes in favour of private funding (80s and 90s).
  - Today given the risk aversiveness on the financial side, there is a need for stronger role of public funding;
  - Crucial for the effectiveness of research and innovation is not so much the funding origin but the performance location.
- Countries with high R&D investments (Finland, Sweden, Germany) typically embrace the view that the financial crisis offers opportunities for domestic structural reforms strengthening R&D and innovation, including the deployment of “green” technologies and eco-innovation; countries with low private R&D investments appear to only marginally refer to research and innovation stimulation measures within their domestic recovery plans;
- In the long term these different policy responses might signal a further growing divide between the OECD countries with the group of technologically leading countries which have the policy room for investing more public resources in knowledge taking a further lead and a group of falling behind countries adjusting their specialisation towards less technologically advanced goods and services.

3. New opportunities/solutions

- At the same time the present economic crisis opens up opportunities, particularly in Europe, to reflect on more efficient use of knowledge resources: sketching-out an ***ideal European policy "if-world"***; even if its political feasibility remains today non-existent…
  - Unfortunately and rather quickly when first signs of recovery emerge, the European debate shifts back into the daily reality of the institutional policy constraints.
  - So this is a particularly timely conference, in which I'll rather cherish the crisis mood rather than the recovery one…
- Knowledge contributes to much more than growth: life expectancy, quality of life, "fifth" freedom……
  - K4SD in ecological terms;
  - K4SD in financial terms: private/public balance in 3% R&D targets, FP's; etc.
  - K4SD in social terms: fifth freedom and barriers to researchers mobility;
- K4SD in governance terms: ***towards a European paradise?*** Three levels of K4SD governance in a new ERA…

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National (higher) education…

- It could be argued that higher education remains first and foremost a nationally organized and funded activity even though the curricula, the evaluation and accreditation of an increasing number of study fields are becoming increasingly internationally organised.
- Over the last decades students in Europe and beyond have become partially mobile thanks to the Erasmus programs and the Bologna reforms with growing transparency of the amount of study points allocated to studies abroad . But full student mobility, with the exception of the inflow of foreign students in the UK and Ireland, and cross border flows in studies limited in terms of admissions, has been limited.
- The dominance of national students in higher education is such that national (regional in those federal member states where higher education is governed at the regional level) governments remain both in terms of administering as well as in terms of financing, in control.
- This being said it is clear that higher education in Europe must be subject to substantial structural reforms in the coming years with the establishment of a European higher education area and the proposed minimal national investment target of 2% of GDP.

European Research

- Research excellence is heavily dependent on ***scale***: the European scale is the logical scale for most publicly funded research activities, for reducing costs in selecting and evaluating research proposals and for enabling high quality research specialization.
- The normative claim which can be made is that European research policy should ultimately evolve into a ***Common Research Policy***.
- The current existence of a ERC ***next*** to 27 individual member countries research councils is unsustainable: ***joint programming*** as way out: a “soft” but rather ineffective European policy tool?
- Inter-governmental initiatives (Eureka?) will flourish (Gago on unexpected consequence of Lisbon).
- Need for revision of FP’s in terms of content and governance with as ultimate target ***better*** performance than any national programme. Along the lines of the EIT? Along the lines of the European energy alliance mentioned by the Commissioner?

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Regional innovation

- Technology transfer, the use and re-use of technology from elsewhere as well as innovation and entrepreneurship have a strong regional and local focus and governance need.
- One of the core problems of the “locational tournament” tendencies amongst competing regions in innovation policy is their lack of local anchorage. What Foray describes as the “innovate here, benefit elsewhere” pattern characteristic of poorly locally integrated regional innovation policies.
- Do regions have the capacities to design “smart” innovation policies? Can Europe help?
    - Regional “best practice” expertise from other European regions that have been successful in designing “smart” innovation policies.
    - There are in Europe numerous cross-border, so-called Euregions confronted in a more direct way with the lack of integration of national research and innovation policies.
- A comment though on the smart specialisation concept: I would propose in the year of Darwin the notion of a strengthening of European ***smart speciation*** bringing to the forefront the way Europe, characterized by diversity, must have a long tail of “*untapped innovative potential*”.

Conclusions: opportunities linked to coordination in policies

- Remains surprising how current economic crisis is being discussed primarily in national terms...
- Research and knowledge investments are a priority area for rethinking the governance level of national, European and regional knowledge policies:
  - Continuous hIgher, catching-up growth in new member states will crucially depend on diffusion and technology transfer;
  - European institutional changes needed “to make Europe the prefered continent for reserachers, attracting the best brains in the world who can move freely”...
  - Global and local environmentally sustainable growth crucially dependent on access and fast diffusion/use to research and eco-innovations.
- New central challenge to technology and innovation policy: move away from the old obsession with technological competitiveness to a global view in which access, diffusion and effective use become central elements... Citizens in Europe (as in the US and Japan) are ultimately dependent on the speed and effective use of (green) knowledge diffusion in ***both*** their countries as well as those in the rest of the world.

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4. Globalisation and the crisis: a historical return to normal?

- What remains striking from ahistorical perspective is how the two largest countries in the world: China and India, saw their share of world population and their share of world GDP more or less continuously fall over the period 1820 till 1973. Actually, I would hypothesize that in 1973, the imbalance between the world's concentration of GDP and the world's concentration of population was the highest the industrialized world ever winessed.
- This extreme geographical inequality in world GDP has formed the basis of the unilateral focus of both social scientists and policy makers on domestic competitiveness and in particular on technological competitiveness as the essential feature for a country's future economic growth.
- As Ulrich Beck put it: "The consequences of globalization for sociology have been spelt out most clearly in the English-speaking countries, but above all Britain, where it has been forcefully argued that conventional social and political science remains caught up in a national-territorial concept of society. Critics of 'methodological nationalism' have attacked its explicit or implicit premise that the national state is the 'container' of social processes and that the national framework is still the one best suited to measure and analyse major social, economic and political changes. The social sciences are thus found guilty of 'embedded statism' and thought is given to a reorganization of the interdisciplinary field".

China and India's late industrialisation

- However, the recent rapid industrialisation of China and India appear e.g. from the available Cambridge world economic model simulations (Izurieta and Singh, 2008) non-sustainable. It will ultimately lead to financial imbalances with a huge current account deficits for the U.S. economy but also other resource constraints.
- Furthermore from an environmental perspective at current levels of technology, growth rates of 3% per annum in the advanced G7 countries and rapid sustained growth in emerging economies are unsustainable in terms of agriculture production, access to water and climate impact.
- At the same time, fast economic growth in India and China appears a social necessity because of the need to shift hundred of millions of people from farms to industry. In the Indian case there is an additional compulsion of providing jobs for a labour force which is growing at 2% per annum.
- The advent of the ICT revolution in the 90's has radically challenged the national-territorial bias in research and policy making. The cluster of ICT represents from a global perspective a historically unique process of technological, organisational and above all social transformation in terms of speed and world-wide impact. A level playing field in ***aspirations***: in consumption, income and quality of life.

G-5 share of population and GDP

Percentage share of world population

Year	China	India	Brazil	South Africa	Mexico	Total
1820	36.6	19.9	0.4	0.1	0.6	57.6
1870	28.1	17.0	0.8	0.2	0.7	46.8
1913	24.4	14.2	1.3	0.3	0.8	41.0
1950	21.7	14.8	2.1	0.5	1.1	40.2
1973	22.5	14.8	2.6	0.6	1.5	42.0
2001	20.7	16.5	2.9	0.7	1.7	42.5
2006	20.2	16.9	2.9	0.7	1.7	42.3

Percentage share of world income

Year	China	India	Brazil	South Africa	Mexico	Total
1820	32.9	16.0	0.4	0.1	0.7	50.1
1870	17.1	12.1	0.6	0.2	0.6	30.6
1913	8.8	7.5	0.7	0.4	0.9	18.3
1950	4.5	4.2	1.7	0.6	1.3	12.3
1973	4.6	3.1	2.5	0.6	1.7	12.5
2001	12.3	5.4	2.7	0.5	1.9	22.8
2006	16.8	6.1	2.4	0.5	1.8	27.4

Source: Deepak Nayyar (2008) based on data from Maddison (2003); Maddison(forthcoming)

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A new emerging innovation development paradigm?

- Traditionally product innovation has been driven by ***professional use*** demand directed towards the tip of the income pyramid: the long tail of product quality,
- In a global setting, this has offered growth expansion opportunities to global firms thanks to rising income inequality in developed and emerging economies.
- The present crisis is indirectly also the illustration of the unsustainable growth nature of this innovation process: the sudden and lasting “fall out” of (high income) demand appears also an illustration of the conspicuous nature of much of this consumer demand;
- Search on the part of the business community in the absence of Keynesian global redistribution policies for “long tails” growth elsewhere… remember Ford’s T-model:
  - Growth at middle income levels, youngsters, elderly, green consumers, etc.
  - Growth at low income levels: bottom of the income pyramid innovations (Prahalad), local grassroots innovations (Anil Gupta).

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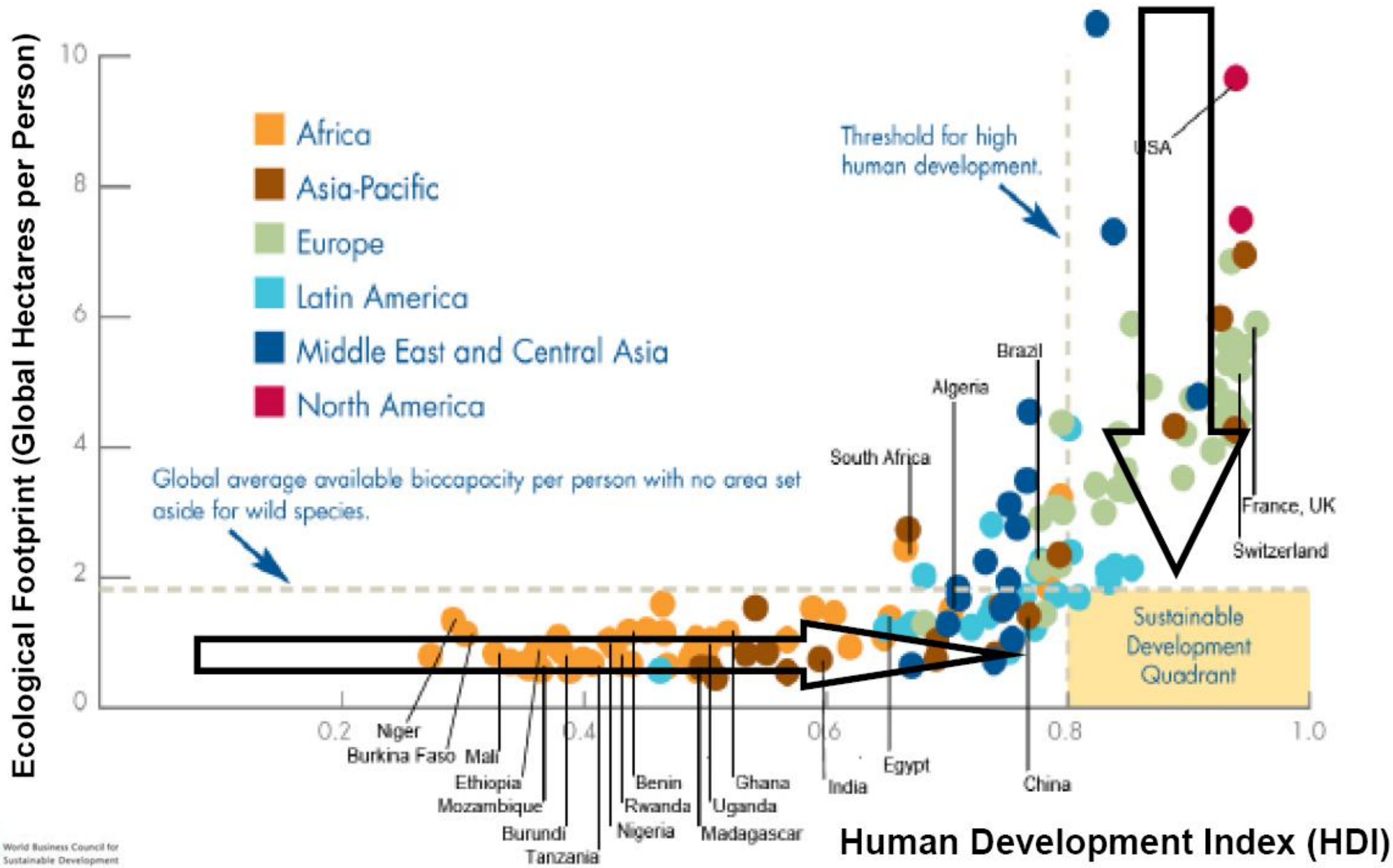
Research insights from the South

- Developing markets appear to raise some of the most motivating research/innovation challenges
  - Autonomy, unwired to high quality infrastructure (energy, water, roads, terrestrial communication);
  - Low education hence necessity of simplicity in use;
  - Less maintenance/repair facilities, so an intrinsic need for long term sustainability;
  - Extreme income inequalities with strong needs in urban slums and poor rural villages, but little current purchasing power and high living risks, hence low willingness to invest or borrow money in the long term.
- All these features appear also and increasingly of particular value to consumers in developed countries:
  - Autonomy of high quality infrastructure as “freedom of movement”;
  - Shift in the democratization of innovation: from the needs of sophisticated, bèta users to the needs of (digital) illiterates;
  - Need for zero maintenance and ecological sustainable: cradle to cradle
  - Relevance of new financial products such as micro-credit and micro-insurance in poor urban areas

The global knowledge challenge



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