Technology diffusion in the developing world

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Prospects for developing countries

- U.S. sub-prime crisis has had limited effects on developing countries
Perceived riskiness of high-yield corporate bonds increased more than EM bonds

High-yield spread
High-income countries

EMBI spread

Source: Bloomberg, JPMorgan-Chase.
...but in historical perspective, the present widening of spreads is modest.

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Source: JPMorgan.
Emerging equity markets fell sharply but more-than recouped earlier losses...

Source: Morgan-Stanley, Thomson/Datastream.
Prospects for developing countries

- U.S. sub-prime crisis has had limited effects on developing countries
- Resilience among developing economies mitigates the U.S. slowdown and helps adjust global imbalances
Weakening of U.S. domestic demand started well before financial turmoil. Growth of investment and imports, 4-quarter moving average.

...with import demand from the developing world a support U.S. exports
nominal growth in US$, 12m/12m ch%

Gradual reductions in U.S. current account deficit likely to continue

U.S. current account balance, % of GDP

Source: U.S. Department of Commerce.
Prospects for developing countries

• U.S. sub-prime crisis has had limited effects on developing countries

• Resilience among developing economies mitigates the U.S. slowdown and helps adjust global imbalances

• Growth in developing economies is expected to slow only modestly over the coming 2 years
Strong growth in developing countries

Real GDP, percent change

Forecast

Developing economies

Strong growth in developing countries

Real GDP, percent change

Developing economies

High-income

In Turkey stability is needed

Commodity prices ease in tandem with demand growth in developing countries

Indices, crude oil and metals and minerals, 1981=100

Crude oil
Metals
Forecast

Food prices increased sharply in recent months

Commodity price indices, 1990=100

Source: DECPG Commodities Team.
Two main risks for developing countries

- Worsening of the credit crunch and U.S. recession would affect developing countries quite adversely

- Lower global interest rates and increasing liquidity can create new bubbles and escalation in inflation pressures
Technology diffusion in the developing world

- The technology gap between rich and poor countries has narrowed -- but remains large.
- Progress in developing countries reflects the absorption of pre-existing technologies – not at-the-frontier inventions.
- Globalization has been a main driver of technological progress.
- Technology diffusion across countries has picked up, but diffusion within countries remains slow and penetration rates uneven.
- Persistent weakness in technological absorptive capacity may constrain further technological progress.
Technology gap: narrowing but still wide

Index of technological achievement

Technology diffusion in the developing world

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Developing countries are scarcely active at the global technology frontier

Intensity of scientific innovation and invention, High-income countries=100

Technology diffusion depends on exposure to foreign technology and absorptive capacity.

Technology diffusion in the developing world

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Market openness and contact with the diaspora stimulate technology transfer

High-tech Imports (% of GDP)

Size of diaspora (% of origin-country population)

Source: CEPII, BACI database; World Development Indicators
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Diffusion across countries has accelerated but penetration within countries remains weak.
Intensity of use of some technologies in selected developing regions (early 2000s)

1. Scientific articles, per capita
2. Royalty and license fee receipts, % GDP
3. Electric power consumption, per capita
4. Tractors, per unit of arable land
5. Internet users, per 1,000 people
6. Cellular subscribers, per 100 people

Intensity of use of some technologies in selected economies (early 2000s)

Czech Republic  Hungary  Russia

Romania  Turkey

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Progress in absorptive capacity

Substantial improvements
1. Macroeconomic environment
2. Financial structure and intermediation

Relatively weak improvements
1. Basic and advanced technological literacy
2. Regulatory environment and governance
Despite high enrolment rates, few students pass standardized tests (2000s)

**Sources:** SACMEQ II (2000), PIRLS (2001), and DHS
Key features of a pro-technology policy stance

- No detailed roadmap for promoting technological progress, but certain policy directions are indicated:
  - Maintain openness to trade, foreign direct investment and participation of diaspora
  - Further improve the investment climate so as to allow innovative firms to grow and flourish
  - Improve basic infrastructure (roads, electricity, telephony)
  - Raise the quality and quantity of education throughout economy not just major centers
  - Emphasize technology diffusion by reinforcing dissemination systems and the market-orientation of R&D programs
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For more info:

Forecast:  http://www.worldbank.org/GlobalOutlook
Updates:  http://www.worldbank.org/GEM