Impact Forecasting of ICT Strategies: The World Bank Experience in Tunisia

Ministry of Communications and Information Technologies, Egypt
Agenda: how we assessed and evaluated the impact of the Tunisia ICT Strategy

1. ICT Strategy Assessment
2. Impact Evaluation Methodology
3. Working Interaction
4. Implementation
ICT Strategy Assessment

- Definition of Goals and Objectives
- Identification of Policy Measures
- Measurement ICT Industry
Definition of Goals and Objectives

- Tunisia defined the objectives of its ICT Strategy 2001 in terms of contribution to GDP growth and employment creation.
- Set measurable targets
  - The country’s 10th Development Plan set a target for the ICT sector to increase its share of revenues in GDP from 3.3% to about 8%.
  - Increase sector workforce from 11,500 to 31,500 employees.
Identification of Policy Measures

- The Government defined a set of policy measures to stimulate the growth of the ICT sector;
- The study contained simulation and forecasting tools to assess whether these policies were likely to yield the desired results;
- The policies were fine-tuned as the impact forecasting study progressed.
ICT Strategy Assessment

- Identification of Policy Measures
  - Definition of key measures and support measures
  - Simulation and scenario analysis around some key measures, notably telecommunications liberalization
### ICT Strategy Assessment

<table>
<thead>
<tr>
<th>Year</th>
<th>Key Measures</th>
<th>Support Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>Award a 2nd GSM license</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Award licenses of Data transmission</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>Award 3rd international Licenses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Award local and Ld licenses</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>Full liberalization</td>
<td></td>
</tr>
<tr>
<td>2005-06</td>
<td>Award a third GSM license (in 2007)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Award licenses of Data transmission</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Award of retail operator licenses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full liberalization</td>
<td></td>
</tr>
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<td>Award a third GSM license (in 2007)</td>
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</tr>
</tbody>
</table>

**Strengthen Regulatory Framework**

- **Develop Brand of Tunisia as Favorable Business Location for ICT**
  - Assist start ups in research for funds, preparation of business plan, national and international networking
  - **technological Incubators**
  - Change regulation on venture capital
  - Create ICT Fund
    - Facilitate « exit options » for technology SMEs investors

**Upgrade Tunisia Human Capital in ICT**

- **Outsource IT Procurement in Tunisian Public Administration**
  - Develop “e-government Program”
  - Develop Sector Portals
  - Develop e-payment solutions for e-commerce
  - Make the private firms active elements in e-commerce

**Key measures**

- **Intermediate liberalization Scenario GDP growth from 6 to 6.8% in 2006**
- **Accelerate liberalization scenario GDP growth of 8% in 2006**
ICT Strategy Assessment

- Measurement ICT Industry
  - Disaggregating of ICT Industry by Sub-sectors of Economic Activity
  - Measurement of economic turnover and employment by sub-sector
## Assessment ICT Strategy

### Disaggregating ICT Industry by Sub-sectors of Economic Activity

*(keep in mind it is 2001 market structure)*

<table>
<thead>
<tr>
<th>Sector</th>
<th>Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Telecommunications Equipment</td>
<td>Manufacturing, Assembly, Testing, Deployment</td>
</tr>
<tr>
<td>2. Computer Equipment Hardware</td>
<td>Assembly, Configuration, Customization, Rollout, Maintenance repair and operations, Asset management</td>
</tr>
<tr>
<td>3. Telecommunications Services</td>
<td>Fixed Voice Telephony Services, Cellular, Paging and other Mobile Services, Data Services, Internet Services Provision, Virtual Private Networks Services, Other Telecommunications Services</td>
</tr>
<tr>
<td>4. Networking Services</td>
<td>Engineering, Maintenance Repair and Operations, Rollout and integration, Configuration management, Automated software distribution, Network management, Load balancing and monitoring, Security</td>
</tr>
<tr>
<td>5. Software and Software Services</td>
<td>Packaged software for general applications and vertical markets, Customized software for individual enterprises, Development platforms, Programming languages and Tools, Systems, Web Site development, Software Integration, Testing, Coding, Maintenance, Technical Support, Localization and Translation, Customization, Application Service Providers</td>
</tr>
<tr>
<td>6. IT-Enabled Services</td>
<td>Data Conversion (data entry, GIS, Medical transcription, Legal databases, Database management, Data Warehousing, Data mining); Voice Center Operations (Call Center, Reservation Centers, Insurance Claims Processing, Help Desk, Telemarketing); Back Office Operations</td>
</tr>
<tr>
<td>7. Advanced Media Services</td>
<td>Computer Graphics, Multimedia, Animation, Interactive Instructional material, Movies, Music, Games, Digital Content Creation, Datacasting/Digital Broadcasting, Cable</td>
</tr>
</tbody>
</table>
**Assessment ICT Strategy**

**Measurement of economic turnover and employment by sub-sector**

<table>
<thead>
<tr>
<th></th>
<th><strong>2000</strong></th>
<th></th>
<th><strong>2006</strong></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revenues ($M)</td>
<td>Total Workforce</td>
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<td>Revenues ($M)</td>
</tr>
<tr>
<td><strong>Telecom Equipment</strong></td>
<td>100</td>
<td>1500</td>
<td>160</td>
<td>2800</td>
<td>200</td>
</tr>
<tr>
<td><strong>Telecom Services</strong></td>
<td>370</td>
<td>8000</td>
<td>670</td>
<td>12000</td>
<td>1300</td>
</tr>
<tr>
<td><strong>Networking Services</strong></td>
<td>25</td>
<td>800</td>
<td>50</td>
<td>1500</td>
<td>100</td>
</tr>
<tr>
<td><strong>Computer Hardware</strong></td>
<td>100</td>
<td>500</td>
<td>170</td>
<td>800</td>
<td>200</td>
</tr>
<tr>
<td><strong>Software and Software Services</strong></td>
<td>50</td>
<td>500</td>
<td>130</td>
<td>2000</td>
<td>300</td>
</tr>
<tr>
<td><strong>IT-enabled Services</strong></td>
<td>10</td>
<td>200</td>
<td>40</td>
<td>1000</td>
<td>240</td>
</tr>
<tr>
<td><strong>IT Applications</strong></td>
<td>3</td>
<td>50</td>
<td>10</td>
<td>250</td>
<td>40</td>
</tr>
<tr>
<td><strong>Advanced Media Services</strong></td>
<td>2</td>
<td>50</td>
<td>10</td>
<td>150</td>
<td>120</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>660</td>
<td>11500</td>
<td>1250</td>
<td>20500</td>
<td>2500</td>
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- **Revenues as % of baseline GDP**: 3.3%, 4.1%, 7.8%
- **GDP level**: 20,100, 30,650, 31,900
- **GDP gains (against baseline)**: 0.8%, 4.5%
Impact Evaluation Methodology

- Methodological Framework: ICT and Growth
- Impact Forecasting
- Risk Analysis
Impact Evaluation Methodology

- Methodological Framework: ICT and Growth. THREE ROUNDS OF IMPACT
  - First-round impact: Growth spillovers from increased ICT expenditures
  - Second-round impact: Growth fuelled by declining production costs
  - Third-round impact: Reductions in transaction costs and faster productivity growth.
First-round impact: Growth spillovers from increased ICT expenditures
**First-round impact: Growth spillovers from increased ICT expenditures.**

**TOOLS:**

a) Forecasting impact of telecom liberalisation (econometrics and simulation)

b) Intra-industry growth (correlation analysis)

c) Competitive analysis analysis for export services
Second-round impact: Growth fuelled by declining production costs. TOOLS:
- Input / Output (I/O) Matrix
Impact Evaluation Methodology

- Third-round impact: Reductions in transaction costs and faster productivity growth.
  - TFP Analysis
  - Econometric Model on Impact on Macro Variables
Impact Evaluation Methodology: an Overview

Growth spillovers from increased ICT expenditures

Second-round impact: Growth fuelled by declining production costs

Third-round impact: Reduction in transaction costs and faster productivity growth.

- Forecasting impact of telecom liberalisation (econometrics and simulation)
- Intra-industry growth (correlation analysis)
- Competitive

Input / Output (I/O) Matrix

- TFP Analysis
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### Impact Forecasting. Scenario Analysis

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Risk Analysis

- Identification critical measures
- Identification risk factors
- Factors Modelling in three stages growth model
- Simulation analysis on the basis of econometric model
- Creation of high case and base case scenario
- Stress testing for exogenous variables (e.g. recession, financial crisis etc.)
Two teams: Government of Tunisia and World Bank Team

Regular Missions and Fieldwork

Private Sector Involvement and High Level Buy-In
Working Interaction

- Regular Missions and Fieldwork
  - At least 6 missions of 2/3 weeks each
  - Field survey to map software and IT services industry
  - Interactive sessions with key policy makers
  - Two research teams active on the strategy
Working Interaction

- Two teams: Government of Tunisia and World Bank Team
  - World Bank Team (Macro-economist, ICT/Infrastructure Economist, PSD Specialist; IT/HR Specialist)
  - Consultants (mapping ICT industry; technology consultants; technology positioning consultants)
Private Sector Involvement and High Level Buy-In

- Involvement of private sector, during the ICT industry mapping and as part of the brainstorming sessions
- High level buy-in from Ministry of Planning. Plan Quinquennal endorsed by President of the Republic
Implementation

- ICT Strategy Included in five year plan
- Attribution of responsibilities by agencies
- Division of roles MDIC and MOC
- Coordination role of the Ministry of Communications
- Strong growth, led by telecommunications growth. Growth and Employment objectives achieved. Efforts to sustain growth
Thank You