INTRODUCTORY REMARKS

ORBICOM-IDRC project in five countries
  • Brazil
  • Cameroon
  • Egypt
  • India
  • Malaysia

Collaboration between researchers and statistical authorities
Statistical Compilation of the ICT Sector and Policy Analysis in BRAZIL

Rosa Maria Porcaro

CONTENT

• ICT sector Performance
  – Gross value added (GVA)

• Magnitude & Composition of the ICT sector
  – GVA
  – Labour Market
    • formal and informal segments
    • occupational status

• Foreign Trade

• Some public policy aspects related to the ICT sector
MAGNITUDE OF ICT SECTOR
Gross Value Added, Brazil, 2007

<table>
<thead>
<tr>
<th>ACTIVITY (CNAE)</th>
<th>2007 (million R$)</th>
<th>2007 (million US$)</th>
<th>Economy (%)</th>
<th>Business (%)</th>
<th>ICT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Economy</td>
<td>2,287,858</td>
<td>1,175,008</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total – Business</td>
<td>1,655,008</td>
<td>849,986</td>
<td>72.3</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Manufacturing – Business</td>
<td>443,288</td>
<td>227,666</td>
<td>19.4</td>
<td>26.8</td>
<td></td>
</tr>
<tr>
<td>Services – Business</td>
<td>934,350</td>
<td>479,867</td>
<td>40.8</td>
<td>56.5</td>
<td></td>
</tr>
<tr>
<td>ICT Sector</td>
<td>83,117</td>
<td>42,688</td>
<td>3.6</td>
<td>5.0</td>
<td>100.0</td>
</tr>
<tr>
<td>ICT Manufacturing</td>
<td>10,097</td>
<td>5,186</td>
<td>0.4</td>
<td>0.6</td>
<td>12.1</td>
</tr>
<tr>
<td>ICT Services</td>
<td>73,020</td>
<td>37,502</td>
<td>3.2</td>
<td>4.4</td>
<td>87.9</td>
</tr>
</tbody>
</table>

Source: IBGE – Directorate of Surveys, Coordination of National Accounts (DPE/CONAC) – Special tabulation.
Note: Elaborated by authors.

PERFORMANCE OF ICT SECTOR
Gross Value Added of the ICT Sector, 2000-2007

Source: IBGE – Directorate of Surveys, Coordination of National Accounts (DPE/CONAC) – Special tabulation.
Note: Elaborated by authors.
**COMPOSITION OF ICT SECTOR GVA**

Percentage share, by industry. Brazil, 2002-2007

<table>
<thead>
<tr>
<th>ACTIVITY (CNAE)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT Sector</td>
<td>100.0%</td>
</tr>
<tr>
<td>ICT Manufacturing</td>
<td></td>
</tr>
<tr>
<td>Office machinery and computing equipment (301 + 302)</td>
<td>3.9%</td>
</tr>
<tr>
<td>Insulated wire, cable and electrical conductors (313)</td>
<td>1.3%</td>
</tr>
<tr>
<td>Electronic materials, communication equipment and apparatus (32)</td>
<td>11.0%</td>
</tr>
<tr>
<td>Measuring, testing and control equipment (332+3392+333+3393)</td>
<td>2.0%</td>
</tr>
<tr>
<td>ICT Services</td>
<td>81.7%</td>
</tr>
<tr>
<td>Telecommunications (642)</td>
<td>49.2%</td>
</tr>
<tr>
<td>Computing Activities (72)</td>
<td>32.5%</td>
</tr>
</tbody>
</table>

Source: IBGE – Directorate of Surveys, Coordination of National Accounts (DPE/CONAC) – Special tabulation.
Note: Elaborated by authors.

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**LABOR MARKET:**

Formal and Informal Segments

- **Formal Employment** → workers inside the social security system (80%)
  - Business Sector (60%)

- **Informal Employment** → workers outside the social security system (20%)
  - Business Sector (40%)

- **Magnitude : 1 Million People**
  - % ICT Sector/Economy: 1.1% (3.6% GVA)
  - % ICT Sector/Business Sector: 2.1% (5.0% GVA)
  - Business Sector: 45 million people
  - Total Economy: 87 million people

- **Composition**
  - Employees (80%) → Formal 86%, Informal 14%
  - Self-employed (15%) → Formal 30%, Informal 70%
  - Employers (5%) → Formal 90%, Informal 10%
COMPOSITION: THE TOTAL LABOR MARKET

Intra-sectoral composition of ICT sector employment

Formal and Informal Segments, 2006

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN BRAZIL

COMPOSITION: TOTAL LABOR MARKET
Occupational Status, 2006

Source: IBGE – PNAD, Directorate of Surveys, Coordination of National Accounts – COREN, special tabulation.

Note: Elaboration by authors.
CHARACTERISTICS OF THE FORMAL LABOR MARKET

- Jobs (paid positions) in registered establishments
  - 554,700 jobs - 31,000 establishments
  - 1.6% of the formal economy, 2.6% of the formal Business sector

- Industries with substantial job generation and high job growth
  - Data Processing (16%), Software development and editing (7.5%) and Hardware consultancy (7%)
  - 60% of establishments without employees (74,000)
    - constituted only by the owner and/or partners
  - Manufacture of Office machinery and computing equipment: 6.2%
  - Manufacture of Communication equipment and telephone receivers: 5%

- Other industries with high job growth
  - ICT Wholesale trade: 50% (share ↑ 2 points → 3.3%)
  - Rental of office machinery and computing equipment

ICT TRADE BALANCE AND TOTAL TRADE BALANCE, BRAZIL, 2003-2006

Source: MDIC/Foreign Trade Secretariat, IBGE, ICT Sector publication, 2009.
since the 1980s, activities related to informatics (IT) have been receiving some special attention
- the “market reserve” system
- favored domestic production of computing equipment and limited imports of such products

in the early 1990s, the opening up and the globalization process began (with the end of “market reserve”)  
- attention shifted to software development activities

Main focus was:
- National Education and Research Network (RNP)
- Multi-institutional Thematic Program in Computer Science (ProTeM-CC) and
- National Program on Software for Export (SOFTEX 2000)
More recently → focus on the **microelectronics segment**
- targeting the rise of microelectronic component projects in enterprises, by creating national companies and attracting foreign enterprises
- 3 bases of support:
  - project development (design)
  - back-end production
  - attraction of foundries

In Summary: National government policies providing incentives to important segments of the ICT sector have been growing steadily however in a very broad and non-focused way
- they are neither cohesive nor do they provide articulated support mechanisms
INTRODUCTION

• One of the best endowed countries in Africa

• From 70’s to mid 80’s:
  on the path of emerging

• Mid 80’s to end 90’s:
  on the brink of collapse
  • Poor governance
  • Political uncertainties
  • High level of corruption
    triggered imbalance in the country

• Since 2000, on the path of growth:
  • Average GDP increase: 3% per year
    (without wealth and job creation)
**ICT SECTOR CHARACTERISTICS**

- First country to introduce the GSM in Africa
- Overwhelming domination of telecommunications sectors
  - High performance of mobile sub sector (2 mobile operators)
  - Counter performance of fixed line (Incumbent monopoly over fixed lines)
- Conflicting regulation landscape
  - One audio visual regulator
  - One ICT regulator
  - One telecommunication regulator
  - One media watch dog

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**KEY FINDINGS**

- Sustained growth of the sector in the last few years
- Steady and improved contribution to GDP growth
- Telecommunications branch contributes to approximately 80% of the ICT sector’s strength
- The ICT sector is creating jobs, mostly in the informal sector
- ICT jobs in the formal sector are better paid than in any other sector
  - The productivity per employee is very high in comparison to other sectors
- Manufacturing and R&D are near non-existent
- The mobile sector has reached a near-saturation level

*Without the contribution of the ICT sector, the major problems facing the country (stagnant per capita income, inequitable distribution of income, high level of corruption, and perceived unfavorable climate for business) would have been exacerbated.*
KEY FINDINGS

- Teledensity: less than 1% in 2000 – close to 25% in 2010
- Internet penetration: above 3% in 2010
- Business structure: Individuals (80%); Family owned (8%)
- 85% of women in the telecommunications sub-sector; 15% in Internet
- Life cycle: 2 years
- Self financing: 95%
- Enterprise: 3%
- Association: 2%

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN CAMEROON

### Main ICT Sector Indicators, 2005 (In million FCFA)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>357,348</td>
</tr>
<tr>
<td>Intermediate consumption</td>
<td>186,187</td>
</tr>
<tr>
<td>Value Added</td>
<td>171,161</td>
</tr>
<tr>
<td>Gross salaries of employees</td>
<td>32,543</td>
</tr>
<tr>
<td>Social Contributions carried by employers</td>
<td>2,505</td>
</tr>
<tr>
<td>Other taxes on production</td>
<td>206</td>
</tr>
<tr>
<td>Operating Income</td>
<td>135,907</td>
</tr>
<tr>
<td>Employed (employees and employers)</td>
<td>47,979</td>
</tr>
<tr>
<td>Production per job</td>
<td>7.45</td>
</tr>
<tr>
<td>Value added per job</td>
<td>3.57</td>
</tr>
<tr>
<td>Average salary of declared employees</td>
<td>0.68</td>
</tr>
<tr>
<td>Average salary of undeclared employees</td>
<td>0.61</td>
</tr>
<tr>
<td>Intermediate consumption rate</td>
<td>0.53</td>
</tr>
<tr>
<td>Operating Revenue per job</td>
<td>2.83</td>
</tr>
<tr>
<td>Average income of entrepreneurs</td>
<td>3.50</td>
</tr>
<tr>
<td>Social security contribution rates</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Source: INS, 2010

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN CAMEROON
COMPILATION RESULTS

Key Statistics related to Cameroon Economy ($ US)

<table>
<thead>
<tr>
<th>Description</th>
<th>Cameroon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor force</td>
<td>7.3 million (2009 est.)</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>30.1% (2007 est.)</td>
</tr>
<tr>
<td>Budget revenues</td>
<td>$3.8 billion (2009 est.)</td>
</tr>
<tr>
<td>Budget expenditures</td>
<td>$3.8 billion (2009 est.)</td>
</tr>
<tr>
<td>Industrial production growth rate</td>
<td>-3.5% (2009 est.)</td>
</tr>
<tr>
<td>Current account balance</td>
<td>$673 million (2009 est.)</td>
</tr>
<tr>
<td>Exports</td>
<td>$3.4 billion (2009 est.)</td>
</tr>
<tr>
<td>Imports</td>
<td>$3.7 billion (2009 est.)</td>
</tr>
<tr>
<td>Foreign exchange reserve</td>
<td>$2.9 billion (2009 est.)</td>
</tr>
<tr>
<td>External debt</td>
<td>$2.9 billion (June 2009)</td>
</tr>
</tbody>
</table>

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN CAMEROON

COMPILATION RESULTS

Percentage of GDP – composition by sector


STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN CAMEROON
### Statistical data on Cameroon's telecommunications sub-sector

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of subscribers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed</td>
<td>129,000</td>
<td>115,816</td>
<td>130,694</td>
<td>169,222</td>
<td>255,306</td>
<td>364,898</td>
</tr>
<tr>
<td>Mobile</td>
<td>1,538,857</td>
<td>2,177,000</td>
<td>3,135,700</td>
<td>4,537,000</td>
<td>6,197,400</td>
<td>7,312,168</td>
</tr>
<tr>
<td><strong>Total Subscribers</strong></td>
<td>1,667,857</td>
<td>2,292,816</td>
<td>3,266,394</td>
<td>4,706,222</td>
<td>6,452,706</td>
<td>7,677,066</td>
</tr>
<tr>
<td><strong>Revenues (million FCFA)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed</td>
<td>52,830</td>
<td>50,637</td>
<td>45,000</td>
<td>54,632</td>
<td>57,609</td>
<td>60,387</td>
</tr>
<tr>
<td>Mobile</td>
<td>202,611</td>
<td>228,071</td>
<td>262,481</td>
<td>296,192</td>
<td>309,706</td>
<td>336,546</td>
</tr>
<tr>
<td><strong>Total Revenues</strong></td>
<td>255,441</td>
<td>278,708</td>
<td>307,481</td>
<td>350,824</td>
<td>367,315</td>
<td>396,933</td>
</tr>
</tbody>
</table>


### CONCLUSIONS & RECOMMENDATIONS

- First ICT statistical data compilation ever carried out
- Learning curve
- Most of the data outdated to clearly show the trend
- Need to **reinforce** INS human capacity
- Advisable to conduct research like this every two years, to provide decision-makers with factual data and a clear view of trends
- Adopt a vigorous dissemination strategy
Thank You

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Statistical Compilation of the ICT Sector and Policy Analysis in EGYPT

Nagwa El-Shenawy
The study confirmed that Egypt has exerted many efforts to move towards the knowledge economy after the successful implementation of the Information Society Initiative in 2006 and the ICT strategy 2007-2010 which led to increase ICT exports and Industry development. Now Egypt is moving towards the high end of the value chain through focusing in the next five years on technology innovation and entrepreneurship.

Egypt follows the OECD-Partnership definition of the ICT sector, but with more emphasis on ICT services industries, which contribute the major part in Egypt's ICT value added and investments (70% versus 30% IT).

The national classification adopted by “The Central Agency for Public Mobilization and Statistics (CAPMAS)” in Egypt, ISIC Rev.3 classification was used from 1996 until 2006 to classify different economic activities and match international standards. Then lately they started to adopt ISIC Rev. 4.
The value added of ICT GDP at current prices reached EGP 30.9 billion (US$ 5.6 billion) in 2008/2009, while the ICT value added at fixed prices reached EGP 30.3 billion (US$ 5.5 billion) with an annual growth rate 14.5%.

The ICT sector recorded the highest growth rate proving that it can maintain growth momentum even during times of crisis.

The private sector is playing a leading role in generating the total ICT value added as it contributed about 69% of the total value added generated in 2008/2009.

The number of ICT companies reached 3,470 at the end of 2009, of which 79% were IT companies, 13% IT-enabled services companies, and 8% telecommunications companies. The increase in the number of ICT companies in 2009 was 18% higher than in 2008. As a consequence, the total number of direct employees in the ICT sector reached 182,000 employees in 2009 from 175,000 in 2008. The growth rate of ICT direct employment increased by 19% during the period 2006-2009.

Estimates for ICT sector employment include Telecom Egypt employees, Post employees and Smart Village employees, but do not include jobs created in the outsourcing industry (including call centers, which reached 50,000 employees during the same period). Also, they do not include indirect employees in IT clubs, internet cafes and private communication stores, which was estimated at 500,000 in 2009.

In this context, Egypt’s ICT sector is expected to create around 40,000 new direct jobs within the next 2-3 years, in line with the official launch in 2010 of the second investment ICT zone in Maadi.
Concerning the gender analysis in ICT sector, females account for around 30-40% of the total workforce in ICT sector. Females’ participation is higher in the fixed telecommunications sector reaching 35%, while females in mobile communications services account for 27% of the total employees within the sector.

<table>
<thead>
<tr>
<th>Employees</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females (%)</td>
</tr>
<tr>
<td>Total employees</td>
<td>34</td>
</tr>
<tr>
<td>Fixed</td>
<td>35</td>
</tr>
<tr>
<td>Mobile</td>
<td>27</td>
</tr>
</tbody>
</table>

Source: Ministry of Communications and Information Technology, Information Center.

MCIT is paying great attention to provide equal ICT training opportunities to females to enhance their role within the sector. The number of female trainees in the Information Technology Institute (ITI) and the National Telecommunication Institute (NTI), which provide specialized and professional ICT training, account for 58% and 42% respectively. In addition, females constitute 49% of ICDL certificate holders in Egypt, which is another initiative adopted by MCIT to enhance the computer skills of the different segments of the society.

Percentage of female trainees in ITI and NTI institutes

Source: Ministry of Communications and Information Technology, Information Technology Institute (ITI) and National Telecommunication Institute (NTI).
**ICT INVESTMENTS**

- The total issued capital for ICT companies reached EGP 44.4 billion (US$ 7.9 billion) in 2009, compared to EGP 38.6 billion in 2008 (US$7 billion), thus an annual growth rate of 15%.
- The percentage of issued capital of the telecommunication companies reached 81.4%, while it reached 16.5% for IT companies and 2.1% for IT-enabled services companies.

**ICT issued capital and its subsectors distribution in (2005-2009)**

- 2005: EGP 4.14 billion
- 2006: EGP 6.07 billion
- 2007: EGP 6.25 billion
- 2008: EGP 7.03 billion
- 2009: EGP 7.92 billion
- 2010: EGP 7.99 billion

**EVOLUTION OF THE ICT SECTOR**

**The evolution of mobile market in Egypt, 2000-2009**

- 2000: EGP 2.1 billion
- 2001: EGP 5.1 billion
- 2002: EGP 6.8 billion
- 2003: EGP 10.4 billion
- 2004: EGP 15.3 billion
- 2005: EGP 20.9 billion
- 2006: EGP 26.4 billion
- 2007: EGP 32.2 billion
- 2008: EGP 34.5 billion
- 2009: EGP 36.9 billion

**Evolution of the Fixed and Mobile Market (2009)**

- Fixed: 2006 - 60%, 2009 - 62%
- Mobile: 2006 - 40%, 2009 - 38%
The ICT sector GDP at constant prices has been increasing; it reached EGP 30.3 billion in 2008/2009 compared to EGP 23 billion in 2006/2007.

This increase reflected the growth of ICT users and the decrease in ICT services’ prices. Using quarterly data, the ICT value added at fixed prices increased from only EGP 5.1 billion in Q1 2006/2007 to EGP 8.7 billion in Q2 2009/2010.

The private sector contribution in total ICT sector value added increased from 63% to 67% during this period.

The ICT sector contribution to GDP reached 4.2% in Q2 2009/10 compared to 2% in Q1 2006/07. The private sector contribution to the ICT sector’s real GDP reached 4.6% from 3.7% in the same period.

The ICT sector contributed 0.45 percentage points to overall GDP growth, which reached 6.5%, in Q1 2007/08. This contribution increased to 0.50 percentage points in Q2 2009/10, when GDP growth was 4.9%.
INTERNATIONAL TRADE

Between 2004 and 2010, Egypt's exports grew from US$ 150 million to US$ 1,100 million with an average annual growth rate of 90% percent. The key element that led to such growth in ICT exports was the tremendous development in offshoring business in Egypt. Egypt aims to achieve a target of export revenues of over US$ 2 billion by 2013.

PLOT

The tremendous growth of ICT exports (2006-2013)

Source: Ministry of Communications and Information Technology, Information Center. Note: (*) Targeted

POLICY RELEVANCE AND LINKAGES

The Government of Egypt was keen in the past ten years to continue the process of liberalization of Egypt's ICT sector, which in turn increased levels of competition between different operators.

As a result, a major decline in the prices of ICT services took place in Egypt. The prices of telecommunication services declined by 55% through the period 2002-2009. The prices of ICTs in Egypt are considered very competitive compared to many countries around the globe.

The study addressed the linkage between some selective ICT policies and the performance of Egypt's ICT sector within certain periods.

The study attempted to analyze the effect of broadband initiative –which has been launched in 2004 to increase broadband subscribers - number of ADSL users.

In addition, the study tried also to analyze the effect of the deregulation process of the mobile market on both subscribers and prices.
POLICY RELEVANCE AND LINKAGES

- An econometric study concluded that the broadband initiative was successful in reducing the ADSL prices, which led to a real increase in the average number of ADSL users. More specifically, a price decrease of EGP 10 (US$ 1.8) will increase the number of ADSL subscribers by 90,000, on average.

- Moreover, there is a relation between the deregulation processes and mobile prices in Egypt and the entry of a third mobile operator (Etisalat) affected significantly mobile prices, as the mobile price deflator has decreased by 162 points after its entry.

The major restructuring processes that took place from 2004 and 2009 and its impact on ADSL users

The mobile price index can explain 87% of the variance in the number of mobile subscribers.

The mobile price index affects significantly the number of mobile subscribers. If the price basket deflator decreased by one point, the number of mobile subscribers would increase on average by 10,510 subscribers.

The effect of the deregulation process on mobile prices and mobile subscribers, 2002-2009

Source: MCIT.

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN EGYPT
CONCLUSIONS

This study shed light on Egypt’s ICT sector as a highly dynamic sector contributing positively to economic growth and social development and its ability to maintain positive and double digit growth rates despite the effect of the financial crisis.

It confirmed the economic importance of Egypt's ICT sector with respect to its contribution to real GDP growth rates, employment, and overall economy.

Overcoming the impact of 25th Jan. required policies and actions by MCIT to rebuild the trust in the sector and restore Egypt’s positioning in outsourcing.

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN EGYPT

Thank You

Nagwa El-Shenawy

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GDP growth rate of 9% in 2007-08
World's third largest GDP at USD 4.16 trillion (PPP terms)
Services sector contributing 55.7%
Agriculture & allied activities and manufacturing with 17.8% and 15.2% shares
Share of the manufacturing sector stagnant between 2000-01 and 2007-08
India’s non-oil exports (commodities) US$ 136.2 billion, whereas ‘invisible’ exports (services) were US$ 148.6 billion
Macro picture reveals the importance of the services sector
The ICT sector mirrors this as it is dominated by the services sector, with manufacturing forming a very small proportion of the sector
BACKGROUND

- ICT and development linkages recognised by policy
- Pressing need for reliable data
- Reliable data on different aspects of this industry difficult to obtain
- ICT diffusion creating a demand for consistent concepts, definitions across countries and over time

STATUS

- Existing data remains sketchy
- Industry data inadequate and not representative
- Statistics not necessarily in alignment with any international classification system.
- ICT services comprise a large chunk of ICT revenue in India; hardly any robust data on value added
- Revenue data only from the line ministry
- In this study the Indian statistical office presents systematic and internationally comparable data on the ICT sector from the extant official data for the first time
ICT SECTOR TRENDS

- ICT sector GDP increased from US$ 14.4 billion in 2000-01 to US$ 62.9 billion in 2007-08 with CAGR of 21.3%.
- Contribution of the ICT sector to GDP increased from 3.4% to 5.9%.
- Share of ICT manufacturing sector to GDP remains more or less constant with about 0.35%.
- Share of ICT services sector to total GDP increased from 3.6% to 5.5% (US$ 13 billion to US$ 59 billion).
- Annual growth rate of ICT services between 23% and 26%.
- IT services exports increased from US$ 7.3 billion (2003-04) to US$ 23.10 billion (2008-09).
- Contribution of exports in total ICT sector has increased from 64.5% in 2004-05 to 66.1% in 2008-09.

SHARE OF ICT SERVICES TO ICT GVA (%)

Source: Annual Survey of Industries (ASI) and National Accounts Statistics (NAS), MOSPI, Government of India.
DECOMPOSITION OF THE ICT SERVICES SECTOR

Source: National Accounts Statistics (NAS)

ICT SECTOR EMPLOYMENT

Source: NSSO 56th and 61st employment rounds, National Accounts Statistics (NAS), MOSPI, Government of India.
According to NASSCOM, total IT sector exports (excluding BPO) accounted for nearly 61% of the overall Indian IT sector revenue (excluding BPO) in 2008/09. In absolute terms, exports increased from US$9.8 billion in 2003/04 to US$30 billion in 2007/08, and were expected to reach US$34.5 billion in 2008/09. Total IT sector exports (excluding BPO) grew by a CAGR of 23.3% between 2003/04 and 2008/09.
IT services has contributed US$23.1 billion to total IT sector exports (excluding BPO) revenues in 2007/08, and is expected to increase to US$26.9 billion in 2008/09. Its share in total IT sector (excluding BPO) exports is expected to rise marginally from 77% in 2007/08 to 78% in 2008/09. IT services grew by a CAGR of 24.3% during the last six years, from US$7.3 billion in 2003/04 to almost US$27 billion in 2008/09.
Indian software products and engineering services exports have increased from US$2.5 billion in 2003/04 to US$6.4 billion in 2007/08, with a CAGR of 20.7% - and further expected to reach US$7.3 billion in 2008-09. Combined software products and engineering services accounted for 21% of total IT sector (excluding BPO) exports in 2008/09.

Sources: National Account Statistics (NAS), Shi-Hoing Chen, 2010 and Wang, Ling and Shiguo Liu, 2010
FINAL OBSERVATIONS

- Various organizations collecting diverse set of indicators
- Robust ICT infrastructure, supply indicators; planning legacy; ministry
- Household Surveys reflect the compulsions of a developing country: DD side constraints to ICT adoption
- NSSO Household Survey propose to add questions on internet access
- Crucial role played by the private sector in collecting regular industry related data: Industry associations, NASSCOM, COAI, AUSPI
- Indian organizations have to deepen the collection of ICT indicators (especially demand and usage) in order to monitor growth and develop appropriate policy responses for improving ICT access
Thank You

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Statistical Compilation of the ICT Sector and Policy Analysis in MALAYSIA

Ramachandran Ramasamy
MAJOR ECONOMIC THRUSTS TOWARDS VISION 2020: TOTAL DEVELOPMENT

- New Economy Model (NEM)
- Endogenous Growth 2010-2020
- Resilient & Competitive Nation 2001-2010
- Balanced Development 1991-2000
- Growth with Equity 1971-1990
- Laissez-faire / exports; Economic & rural development

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN MALAYSIA

MAJOR SHIFTS IN GROWTH PATTERNS

Malaysian Economy Average Growth:
- 9.2% pre-Asian Financial Crisis (1990 – 1997),
- 5.7% pre-Global Financial Crisis (2002 – 2008)

Malaysian economy recovered fast from the 2009 Global Financial crisis:
- Due to RM67 billion stimulus package and;
- Expanding trade with China and India.

Pre-1997:
ICT Manufacturing was the main driver of economic growth

GDP Growth Rate Based on Constant Prices (%)

Source: Asian Development Bank

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN MALAYSIA


**STRUCTURAL SHIFTS IN THE ICT SECTOR**

**Share of ICT Sector, 2000-2007**

<table>
<thead>
<tr>
<th>Year</th>
<th>ICT / GDP</th>
<th>ICT Manufacturing / Total ICT</th>
<th>ICT Services / Total ICT</th>
<th>ICT Services/Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>2000</td>
<td>11.4</td>
<td>71.2</td>
<td>28.8</td>
<td>6.7</td>
</tr>
<tr>
<td>2001</td>
<td>10.0</td>
<td>64.5</td>
<td>35.5</td>
<td>6.8</td>
</tr>
<tr>
<td>2002</td>
<td>10.1</td>
<td>62.0</td>
<td>38.0</td>
<td>7.4</td>
</tr>
<tr>
<td>2003</td>
<td>9.9</td>
<td>64.2</td>
<td>35.8</td>
<td>7.1</td>
</tr>
<tr>
<td>2004</td>
<td>9.4</td>
<td>65.9</td>
<td>34.1</td>
<td>6.8</td>
</tr>
<tr>
<td>2005</td>
<td>9.5</td>
<td>60.1</td>
<td>39.9</td>
<td>8.1</td>
</tr>
<tr>
<td>2006</td>
<td>9.0</td>
<td>57.1</td>
<td>42.9</td>
<td>8.3</td>
</tr>
<tr>
<td>2007</td>
<td>9.0</td>
<td>58.5</td>
<td>41.5</td>
<td>8.0</td>
</tr>
</tbody>
</table>

- Contribution to GDP declined from 11.4% to 9.0%;
- Contribution to manufacturing also declined from 71.2% to 58.5%;
- BUT, contribution of ICT Services increased from 28.8% to 41.5%;
- Within ICT Services, computer services has been growing at 22.0%; Telecommunication Services at 8.8%, resulted in structural shifts

**STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN MALAYSIA**

**MSC MALAYSIA PLAYS A CRUCIAL ROLE IN ICT TRADE SERVICES**

- **ICT Trade Services Based on BOP Estimates : 2000-2008**
  - Export at CAGR 35.1%;
  - Import at CAGR 18.6%

- **ICT Export by MSC Malaysia: 2003-2007**
  - Export 30.0% growth;
  - Local sales 18.0% growth

- **2003 to 2007:** MSC Malaysia is playing a significant role in the ICT Trade Services

**STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN MALAYSIA**
ICT WORKFORCE DEMAND & SUPPLY

Augmented data using the Malaysian Labour Force unpublished records and PIKOM estimates:

- Low ICT professional growth rate: 4.3%;
- Share of computer professionals increasing at faster rate than electronics & telecommunication engineers
- New entrants, enrolments and output of IT graduates has been declining sharply since 2002;
- Only 10% of IT graduates are employable, as revealed by industry findings

ICT Professional Workforce in Malaysia

<table>
<thead>
<tr>
<th>Year</th>
<th>ICT Professionals</th>
<th>Y-o-Y Growth Rate</th>
<th>Percentage Distribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>301,403</td>
<td>13.5%</td>
<td>IT Managers: 20.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computer Professionals: 37.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electronics and telecommunication engineers: 42.5%</td>
</tr>
<tr>
<td>2002</td>
<td>324,565</td>
<td>7.7%</td>
<td>IT Managers: 21.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computer Professionals: 37.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electronics and telecommunication engineers: 40.8%</td>
</tr>
<tr>
<td>2003</td>
<td>342,070</td>
<td>5.4%</td>
<td>IT Managers: 20.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computer Professionals: 38.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electronics and telecommunication engineers: 41.1%</td>
</tr>
<tr>
<td>2004</td>
<td>356,296</td>
<td>4.2%</td>
<td>IT Managers: 20.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computer Professionals: 38.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electronics and telecommunication engineers: 41.8%</td>
</tr>
<tr>
<td>2005</td>
<td>368,357</td>
<td>3.4%</td>
<td>IT Managers: 20.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computer Professionals: 39.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electronics and telecommunication engineers: 41.8%</td>
</tr>
<tr>
<td>2006</td>
<td>378,873</td>
<td>2.9%</td>
<td>IT Managers: 21.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computer Professionals: 40.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electronics and telecommunication engineers: 41.1%</td>
</tr>
<tr>
<td>2007</td>
<td>388,225</td>
<td>2.5%</td>
<td>IT Managers: 21.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computer Professionals: 41.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electronics and telecommunication engineers: 41.1%</td>
</tr>
</tbody>
</table>

CAGR (%) 4.3 8.4 3.9 2.1

Source: PIKOM estimates from MLFS unpublished records

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN MALAYSIA

ICT PRODUCTIVITY PERFORMANCE INDICATORS

Productivity (Output to Input Ratio) of the ICT Sector by Sub-Sectors, 2000-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>ICT Manufacturing Sub-Sector</th>
<th>ICT Computer Services Sub-Sector</th>
<th>ICT Telecommunication Services Sub-Sector</th>
<th>ICT Services Sub-Sector</th>
<th>ICT Overall Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1.19</td>
<td>1.63</td>
<td>2.64</td>
<td>2.40</td>
<td>1.26</td>
</tr>
<tr>
<td>2001</td>
<td>1.18</td>
<td>1.60</td>
<td>2.38</td>
<td>2.19</td>
<td>1.26</td>
</tr>
<tr>
<td>2002</td>
<td>1.18</td>
<td>1.41</td>
<td>2.41</td>
<td>2.06</td>
<td>1.26</td>
</tr>
<tr>
<td>2003</td>
<td>1.17</td>
<td>1.50</td>
<td>2.36</td>
<td>2.08</td>
<td>1.24</td>
</tr>
<tr>
<td>2004</td>
<td>1.17</td>
<td>1.64</td>
<td>2.00</td>
<td>1.91</td>
<td>1.24</td>
</tr>
<tr>
<td>2005</td>
<td>1.16</td>
<td>1.63</td>
<td>1.98</td>
<td>1.90</td>
<td>1.24</td>
</tr>
<tr>
<td>2006</td>
<td>1.16</td>
<td>1.58</td>
<td>2.00</td>
<td>1.88</td>
<td>1.24</td>
</tr>
<tr>
<td>2007</td>
<td>1.18</td>
<td>1.60</td>
<td>1.94</td>
<td>1.84</td>
<td>1.27</td>
</tr>
</tbody>
</table>

Overall productivity in the ICT Manufacturing and computer services quite stagnant;
Dropped for the telecommunication services from 2.64 in 2000 to 1.84 in 2007

1) Overall productivity
   - ICT Manufacturing
   - ICT Services
      - Telecommunications
      - Computer

2) Labour competitiveness
   a) Added value per labour cost
   b) Labour cost per employee
   c) Unit labour cost

3) Labour productivity
   a) Added value per employee
   b) Total output per employee

4) Capital productivity
   a) Added value per fixed assets

5) Capital intensity
   a) Fixed assets per employee

6) Process efficiency
   a) Added value content

STATISTICAL COMPILATION OF THE ICT SECTOR AND POLICY ANALYSIS IN MALAYSIA
ICT Enabled as a Strategy Towards High Income Nation

High Income Drivers

High Value Innovation

High Value Creativity

ICT Enabled


ICT Services sector undeniably has a crucial role in the...

Thank You

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Statistical Compilation of the ICT Sector and Policy Analysis
PROJECT SYNTHESIS

Mark Uhrbach

ICT SECTOR INDICATORS

• Magnitude of the ICT sector
  – Percentage of business sector value
  – Percentage of employees in business sector

• Composition of the ICT sector
  – Proportion of value added
  – Composition of employment

• Shifting sectors

• Other variables
MAGNITUDE OF THE ICT SECTOR
ICT sector as a share of GDP

India (2008) 5.9
Malaysia 9.0
Egypt 3.8
Brazil 3.6
Cameroon (2009) 2.5

PROJECT SYNTHESIS – STATISTICAL COMPILATION OF THE ICT SECTOR & POLICY ANALYSIS

MAGNITUDE OF THE ICT SECTOR
Percentage of value added of business sector

Finland (2006) 14.8
Malaysia (2005) 13.1
India (2008) 7.4
Brazil (2006) 5.0
Mexico (2007) 4.4

PROJECT SYNTHESIS – STATISTICAL COMPILATION OF THE ICT SECTOR & POLICY ANALYSIS
MAGNITUDE OF EMPLOYMENT
Percentage of business sector employment

PROJECT SYNTHESIS – STATISTICAL COMPILATION OF THE ICT SECTOR & POLICY ANALYSIS

COMPOSITION OF THE ICT SECTOR

PROJECT SYNTHESIS – STATISTICAL COMPILATION OF THE ICT SECTOR & POLICY ANALYSIS
EMPLOYMENT CHARACTERISTICS

• Gender gap still exists; projects demonstrate that a lower percentage of women are employed in ICT sector and at lower wages, particularly in the informal sector

• ICT sector employees have a higher level of education and are younger than their counterparts

• Perceived to be a desirable position because of upward mobility, job security and availability of training opportunities

RESEARCH AND DEVELOPMENT

• The role of the ICT sector in the economy has proven to go far beyond its share of value-added and employment

• In Brazil, the percentage of ICT firms performing internal R&D is much higher than the economy as a whole (57% v. 28%)

• India’s R&D expenditure as a percentage of GDP remains low but has been identified as a priority

• Although the work is carried out in Indian R&D labs, it is reliant on the imported technology and involvement of foreign counterparts
CONCLUSIONS

- The magnitude, composition, and evolution of the ICT sector differ across countries
- Some have substantial ICT manufacturing, others rely almost exclusively on ICT services
- Generally, countries without ICT manufacturing incur ICT trade deficits
- Therefore, policy responses need to be country- and industry-specific

Thank You

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