

Presentation for GSMA

Impact on Education and Healthcare Sector Revenue
from a 10% Increase in Broadband Penetration in India

20 May 2011

Ref: 19927-195



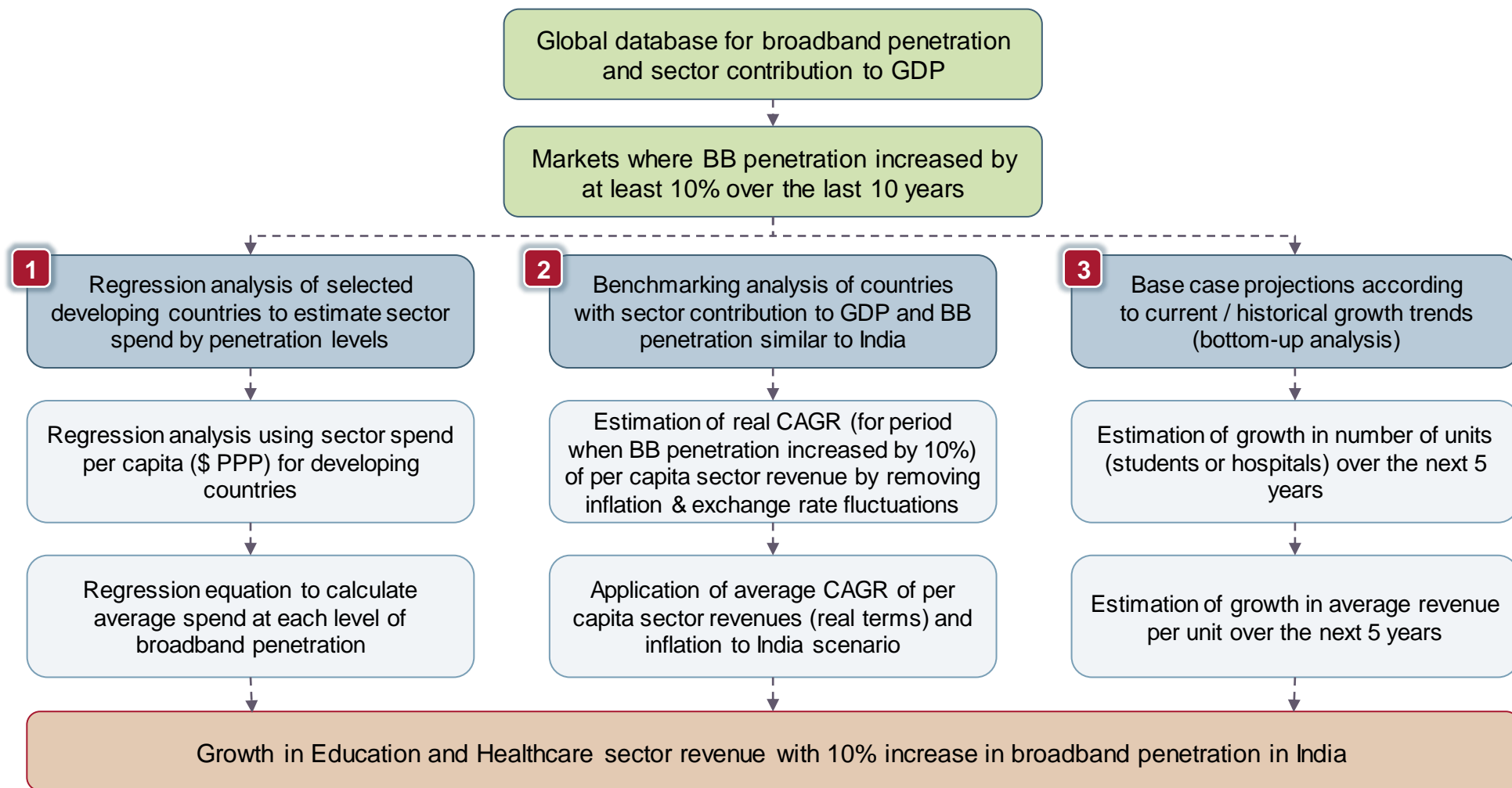
Contents

Approach and Results Summary

Overview of Education Sector and Impact of Broadband

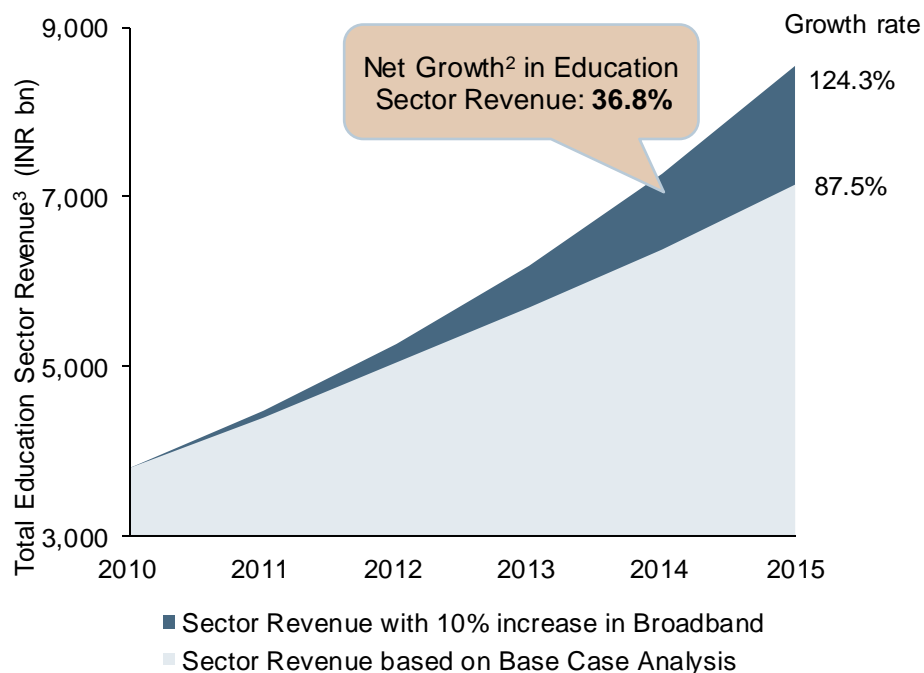
Overview of Healthcare Sector and Impact of Broadband

We used three approaches to estimate growth in education and healthcare sector revenue for a 10% increase in BB penetration



A 10% increase in broadband penetration is expected to result in a 37% growth in education sector revenues...

Impact of 10% Increase in Broadband Penetration on Education Sector Revenue in India¹



Approach 1: Regression analysis of selected developing countries (on PPP basis)

Growth in education sector revenue 95.6%

Approach 2: Benchmarking analysis of countries similar to India in terms of sector contribution to GDP and broadband penetration (using per capita data)

Growth in education sector revenue 124.3%

Approach 3: Base case projections according to current / historical growth trends

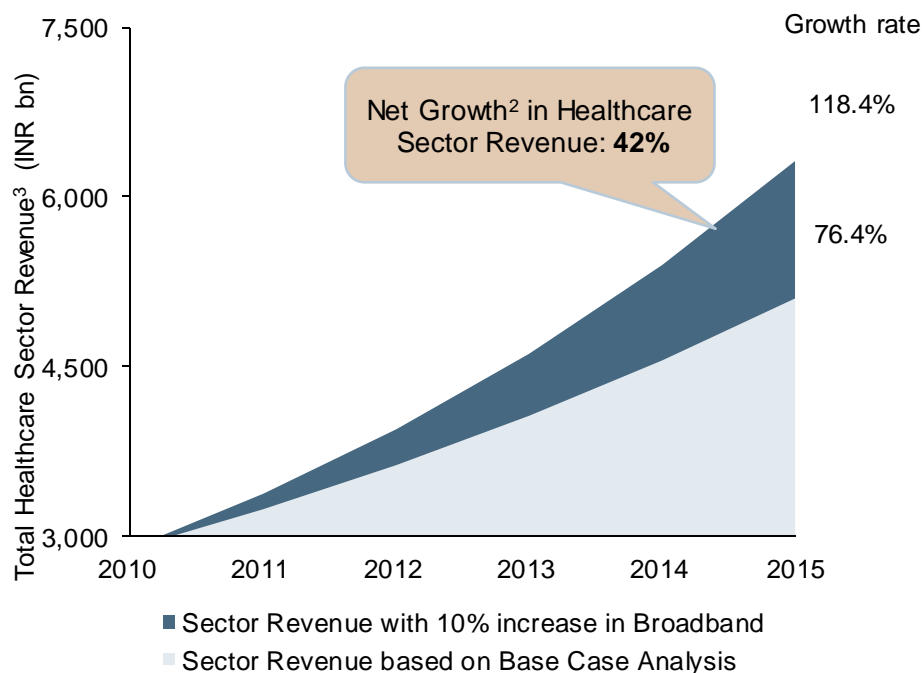
Growth in education sector revenue 87.5%

BB Penetration	0.9%	1.7%	3.5%	6.2%	9.5%	12.5%
----------------	------	------	------	------	------	-------

Note: 1. Based on Approach 2: Benchmarking analysis of similar countries; 2. Net growth due to various factors including increase in broadband penetration; 3. Sector revenue have been estimated in INR to avoid exchange rate fluctuations

... and 42% growth in healthcare sector revenues in India

Impact of 10% Increase in Broadband Penetration on Healthcare Sector Revenue in India¹



Approach 1: Regression analysis of selected developing countries (on PPP basis)

Growth in healthcare sector revenue 131.3%

Approach 2: Benchmarking analysis of countries similar to India in terms of sector contribution to GDP and broadband penetration (using per capita data)

Growth in healthcare sector revenue 118.4%

Approach 3: Base case projections according to current / historical growth trends

Growth in healthcare sector revenue 76.4%

BB Penetration	0.9%	1.7%	3.5%	6.2%	9.5%	12.5%
----------------	------	------	------	------	------	-------

Note: 1. Based on Approach 2: Benchmarking analysis of similar countries; 2. Net growth due to various factors including increase in broadband penetration; 3. Sector revenue have been estimated in INR to avoid exchange rate fluctuations

Source: Analysys Mason, TRAI

Contents

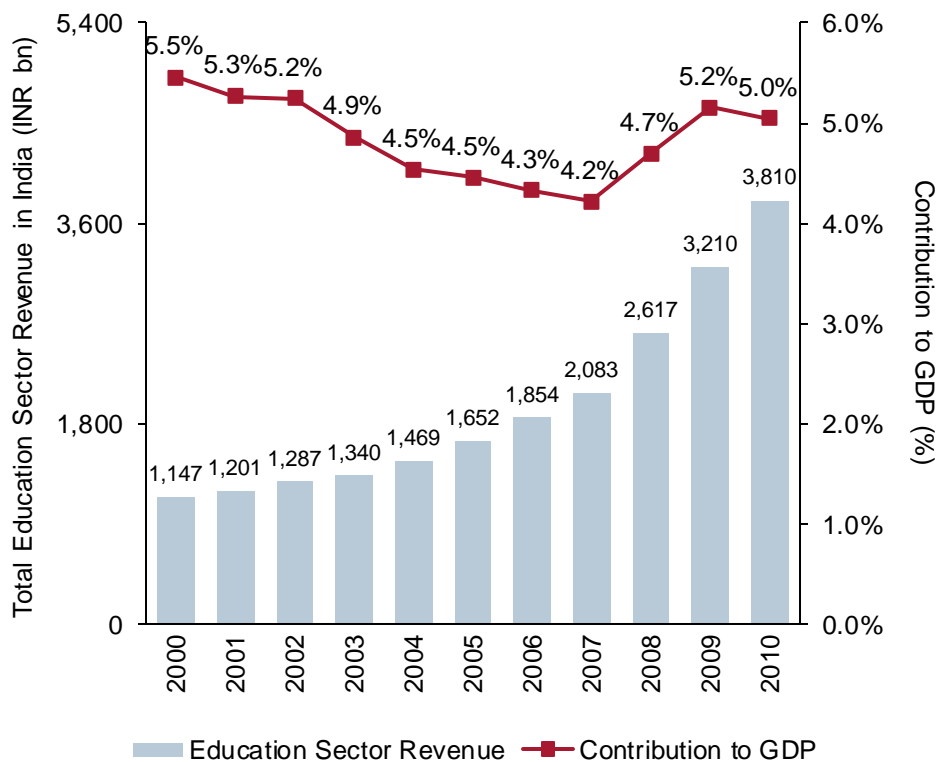
Approach and Results Summary

Overview of Education Sector and Impact of Broadband

Overview of Healthcare Sector and Impact of Broadband

Education spend in India has increased from INR 1,147 bn in 2000 to INR 3,810 bn in 2010, and currently contributes to ~5% of GDP

Education Sector Revenue¹ (INR bn) and Contribution to GDP in India (%)



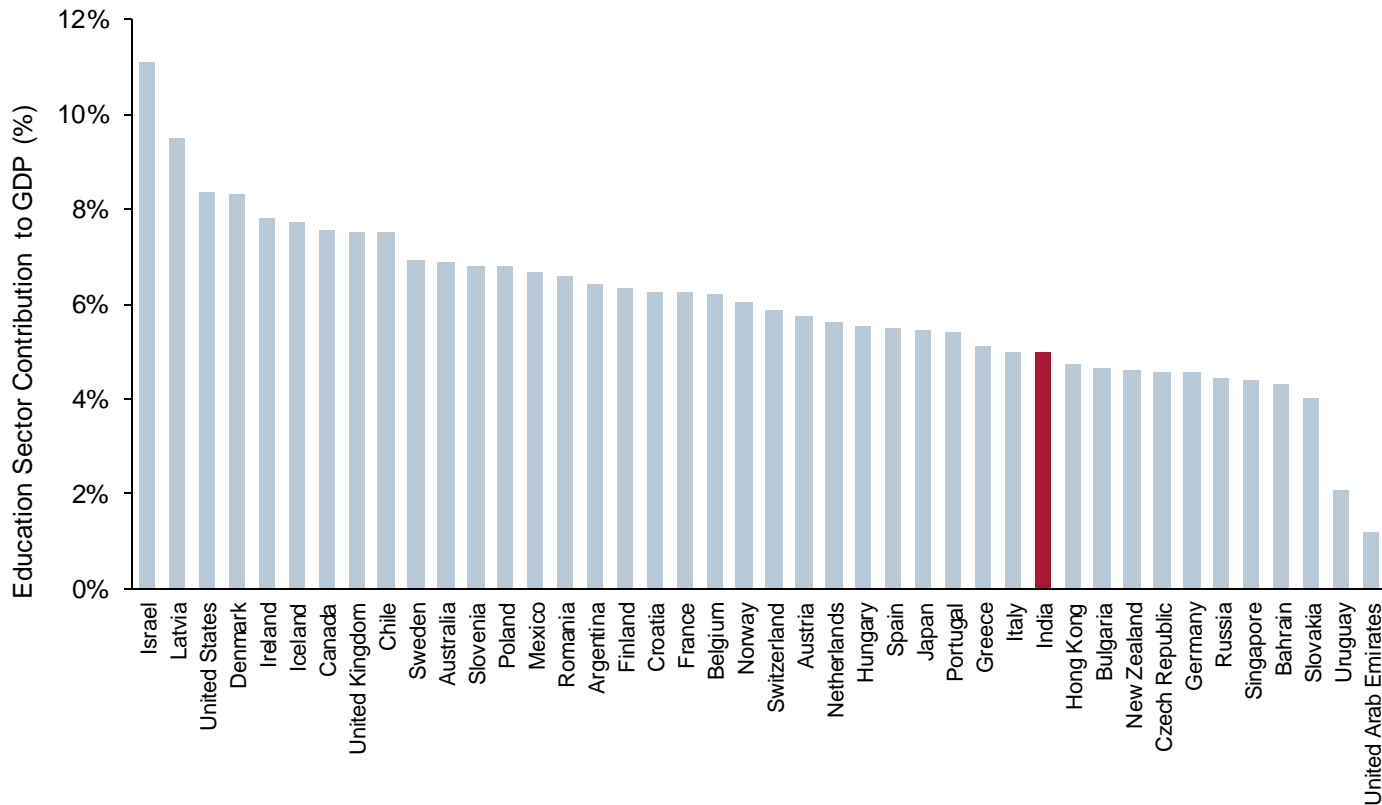
- Number of students enrolled in schools / colleges increased from ~99 mn in 2000 to ~190 mn in 2010
 - ♦ ~40% of population between 5-24 years age is enrolled in 2010, as compared to ~23% in 2000
 - ♦ The government of India aims to increase the GER in higher education to 20% by 2017 from current 14%
 - ♦ Spend per student admitted has also increased from INR 11.6 K in 2000 to INR 20.2 K in 2010
- This growth is primarily driven by public investment in building schools and providing subsidized education through initiatives such as Sarva Shiksha Abhiyan (SSA)
- There has also been an increase in the number of private schools and colleges, online and correspondence courses and partnerships with corporate institutes

Note: 1. Includes both public and private sector revenue. Private sector revenue covers educational services only. It does not include expenditure on educational materials, such as books and stationery or education support services, such as transport services, catering services and accommodation services etc. It includes education by radio or television broadcasting

Source: Analysys Mason, Euromonitor, MHRD, Industry Inputs

In majority of global markets where BB penetration has increased by 10%, the sector contribution to GDP is between 4% and 8%

Education Sector Contribution¹ to GDP in International Markets (2010)



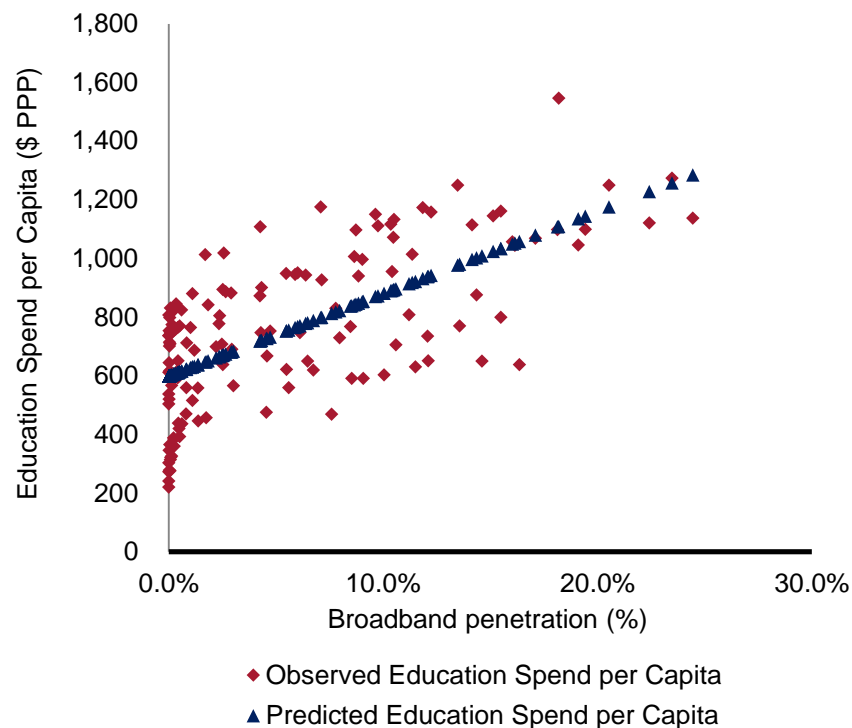
- Globally, 41 markets have witnessed at least 10% increase in their broadband penetration between 1999 and 2010
- In developing countries, current education spend per capita varies between USD 250 and USD 1000, while in developed countries, it varies between USD 1,800 and USD 4,000

Regression analysis suggests a 96% growth in education sector revenue for a 10% increase in broadband penetration

1 Regression Analysis

Approach for Regression Analysis of Education Sector Growth in Selected Developing Countries

Regression equation $\rightarrow y = 2,806x + 599$



- Out of the 41 countries which had experienced an increase of 10% broadband penetration over the last 10 years, the education spend per capita of developing countries (19) was analysed
- A regression analysis was performed on the data from 12 developing countries (after removing 7 outliers¹) to obtain a regression equation to calculate average spend (\$ in PPP) at each level of broadband penetration
- Based on regression analysis, it was observed that India's education sector could grow from INR 3,810 bn currently to INR 7,454 bn for a 10% increase in broadband penetration

• Education Sector Revenue Growth: **95.6%**

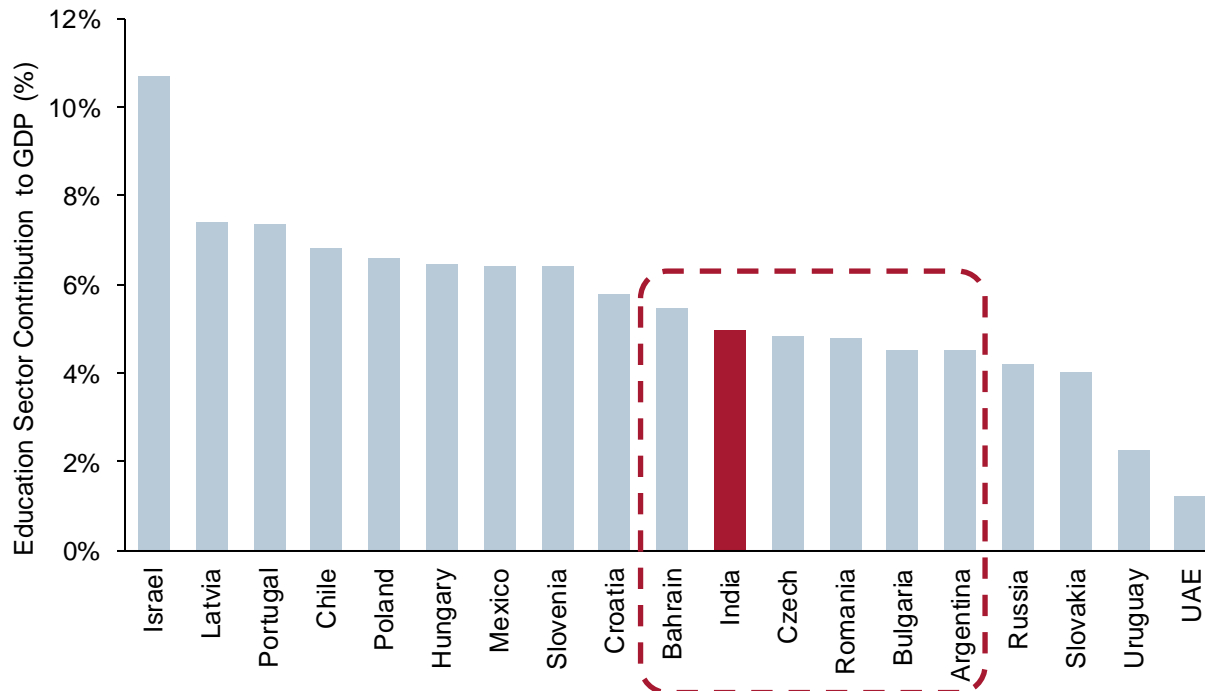
Note: 1. Outliers includes countries with an already high or low spend on education (by PPP)

Source: Analysys Mason, Euromonitor

There are five developing countries which had similar BB penetration (1%) & sector contribution (5%) parameters as India

2 Benchmarking Analysis

Contribution of Education Sector to GDP at ~1% Broadband Penetration¹ for Selected Developing Countries



Developing countries which have witnessed at least 10% growth in broadband penetration over 2000-2010²

- Selected developing countries are further filtered to identify countries which had revenue contribution of education sector to GDP at ~5% when their broadband penetration was ~1%
- These countries represent the impact of broadband on the education sector at different stages of development of broadband (in terms of technology and bandwidth availability) and ICT enabled learning market

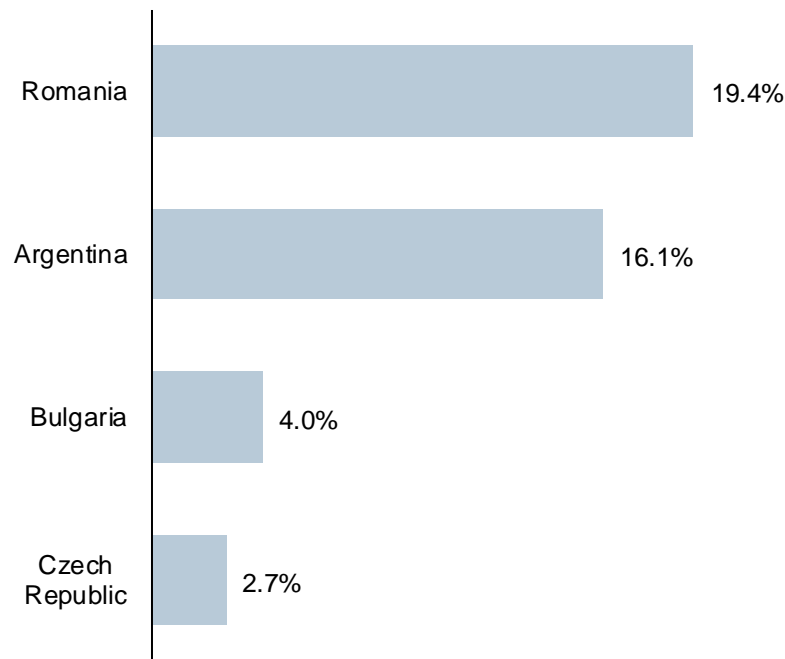
Note: 1. Each country had ~0.9% broadband penetration at different point of time; 2. Duration for a 10% increase in broadband penetration varies for each country

Source: Analysys Mason, Euromonitor

These countries have witnessed 3% - 19% real CAGR in education spend with a 10% increase in BB penetration

2 Benchmarking Analysis

CAGR¹ of Education Sector Revenue per Capita with 10% increase in Broadband Penetration



CAGR in real education revenue per capita after adjusting for fluctuations in inflation and currency exchange rate

Education Sector Growth Drivers

- Improvement in quality of education through faculty training and curriculum development
- Increased focus on higher education in terms of opening of new colleges, universities and improvements in the upper-secondary vocational programs
- Government initiatives such as decentralization of control as well as introduction of subsidies for private schools
- Emergence of technological upgrades to connect institutions through ICT for better monitoring and management
- Growth in distance learning and online universities

- Average nominal CAGR: **16.8%**
- Average real growth (after adjustment for inflation and currency exchange rate): **10.5%**

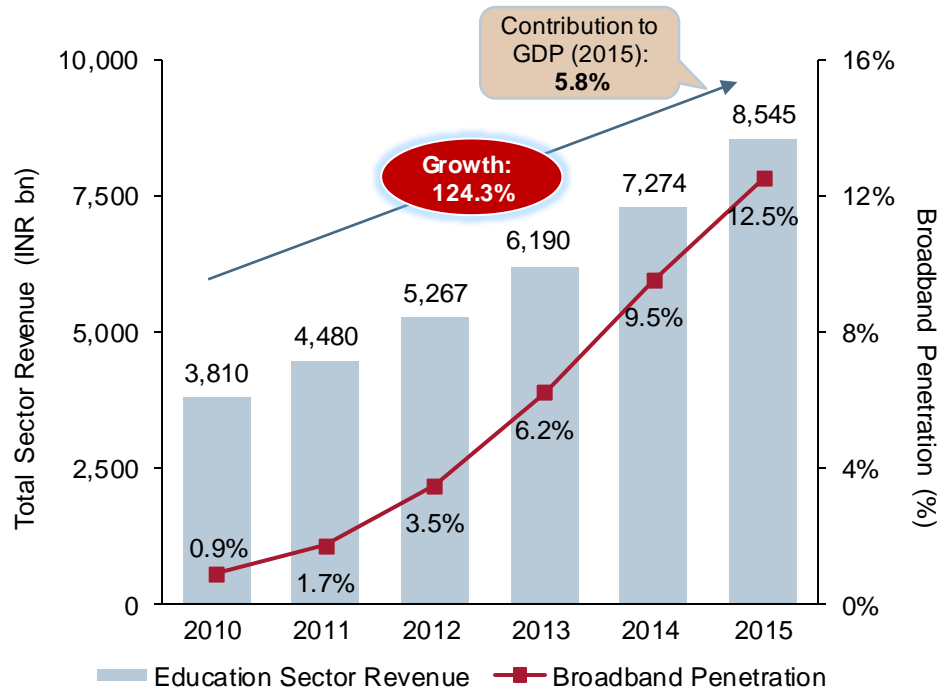
Note: 1. CAGR for period when broadband penetration in that country increased by 10%. Includes growth rate of per capita spend after adjusting for inflation and exchange rate fluctuations. Bahrain is not considered for the analysis due to disproportionate increase in population

Source: Analysys Mason, Euromonitor

Based on the analysis of these countries, India's education sector can realize 124% growth in education sector revenues

2 Benchmarking Analysis

Growth in Education Sector Revenue (INR bn) with 10% Increase in Broadband Penetration in India



Growth Rate Calculation (2010–2015)

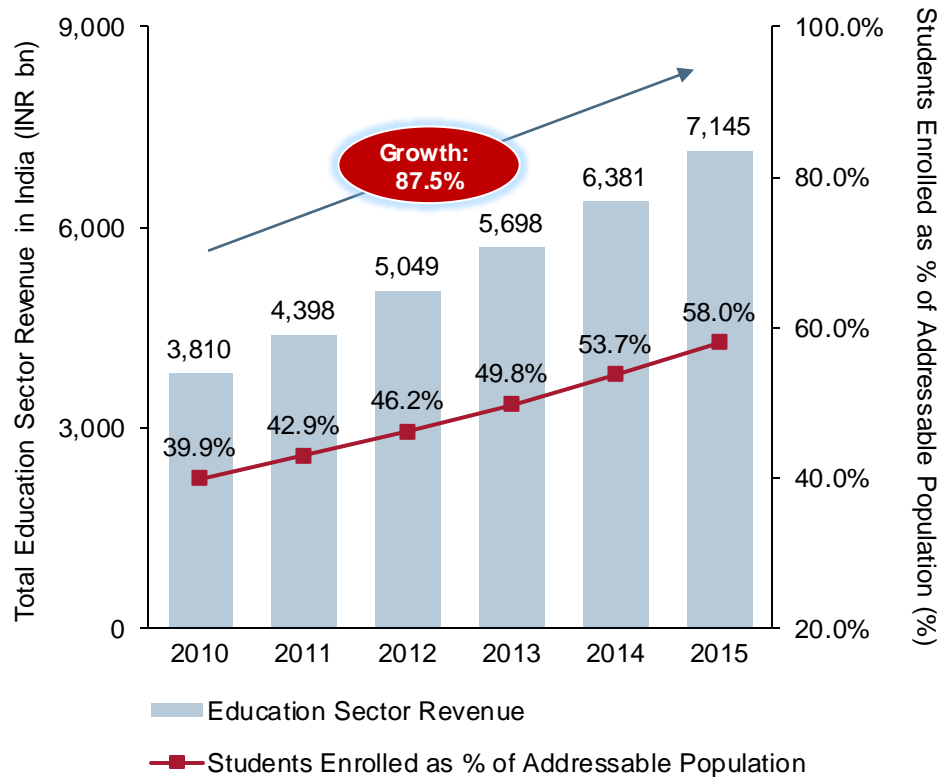
- Real CAGR of per Capita Spend: **10.5%**
- Average inflation from 2010 - 2015: **6.2%**

- Increase in education sector revenue with increase in broadband penetration will primarily be driven by growth in distance learning and e-learning market
- Number of students enrolled in distance higher education is growing at 35% currently, and is continue to grow with increased broadband penetration tier 3 and 4 towns
- This growth will be supported by initiatives by government and private sector for driving adoption of technology enabled learning
 - ♦ Government has been making significant investments in building National Knowledge Network to enable effective delivery of distance education and support advanced research
 - ♦ Similarly, private institutions are adopting ICT to offer online courses and enable multimedia based teaching

Based on current growth trend, education sector revenue in India is expected to grow to INR 7,145 bn in 2015

3 Base Case Analysis

Education Sector Revenue (INR bn) and Student Enrolled as % of Addressable Population¹ (%)



- Number of students enrolled have increased at a CAGR of 8% over the last 10 years to reach 188.9mn in 2010
- Student enrolment is assumed to grow at the same CAGR of 8% from 2010 to 2015
 - ♦ Share of addressable population (between 5 years and 24 years) enrolled in schools and colleges is expected to grow from ~40% in 2010 to ~58% in 2015
- Revenue per student enrolled is expected to vary with inflation from 2010 to 2015

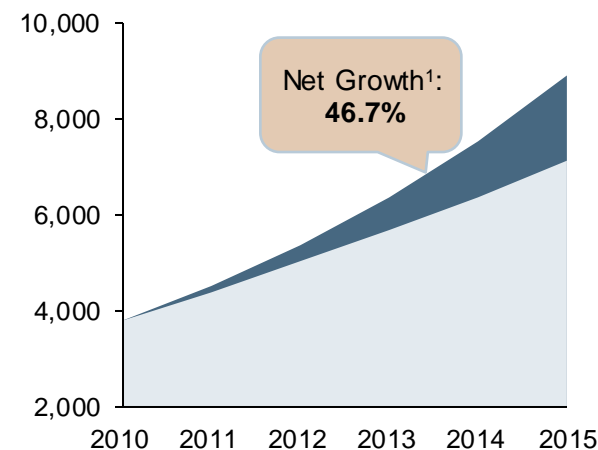
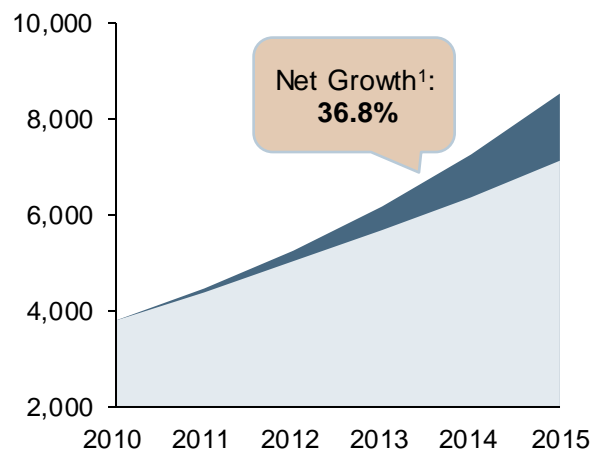
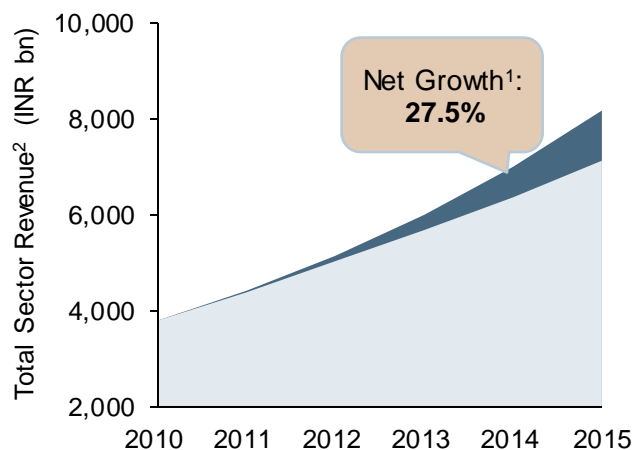
Impact of growth drivers of sector revenue expected to increase with higher increase in broadband penetration in 5 years

Sensitivity Analysis

Scenario 1: Broadband Penetration in 2015: 11.5%

Scenario 2: Broadband Penetration in 2015: 12.5%

Scenario 3: Broadband Penetration after 5 Years: 13.5%



■ Sector Revenue with increase in Broadband

■ Sector Revenue based on Base Case Analysis

Growth drivers of education sector revenue, including broadband penetration, are expected to have an increasing impact on revenue with higher broadband penetration in 5 years

Contents

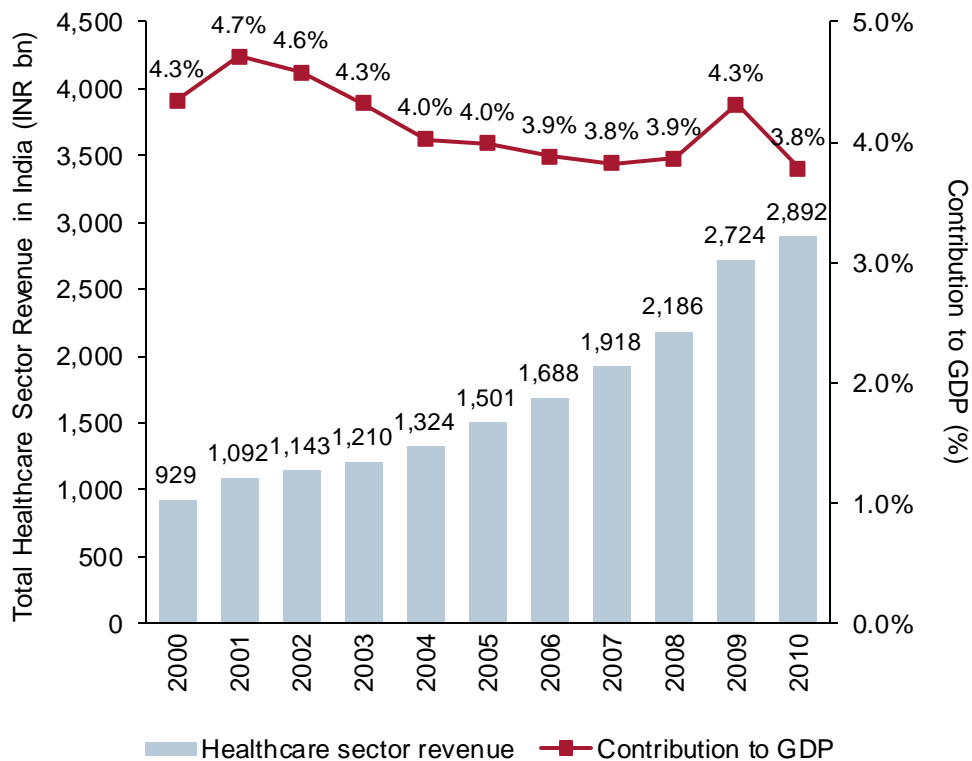
Approach and Results Summary

Overview of Education Sector and Impact of Broadband

Overview of Healthcare Sector and Impact of Broadband

Healthcare spend in India has increased from INR 929 bn in 2000 to INR 2,892 bn in 2010 and currently contributes ~3.8% of GDP

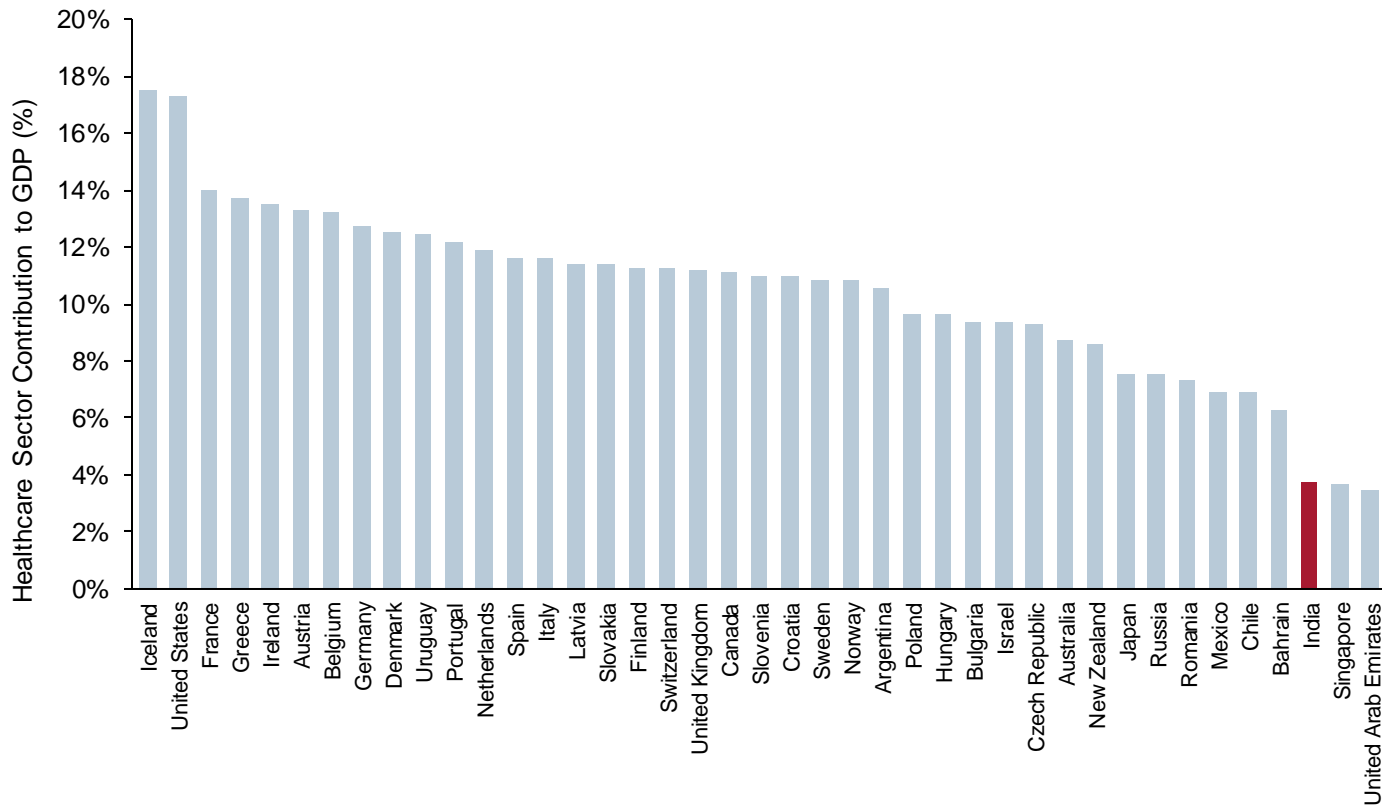
Healthcare Sector Revenue¹ (INR bn) and Contribution to GDP in India (%)



- Healthcare spend per capita has increased at a CAGR of 10.4% over 2000 and 2010 to grow from INR 898 to INR 2,408
- As of Sept, 2010, government had established 146,036 health sub-centres, 23,458 primary health centers and 4,276 Community health centers in the country
- However, private spending dominates the total healthcare sector revenue in India, contributing ~75% of total healthcare sector revenue
- Private spending accounts for over 75% of the human resources and advanced medical technology and 68% of all hospitals (15,097)
- Further, healthcare facilities are limited to top few cities with 80% of doctors catering to top 20% of population

This is much lower than the contribution of healthcare sector to overall GDP for a majority of other international markets in 2010

Healthcare Sector Contribution¹ to GDP in International Markets (2010)



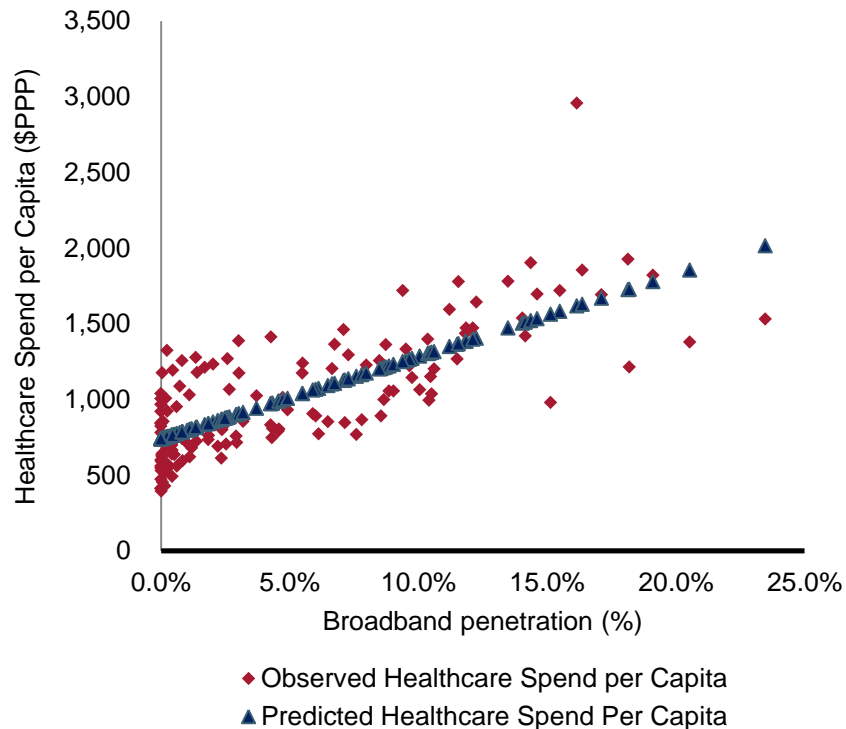
- Developed countries are characterised by relatively higher spends as % of GDP and per capita on healthcare
- For developing countries, current healthcare spend per capita varies between USD 500 and USD 2000, while for developed countries, it varies between USD 4,000 and USD 6,000

Based on the regression analysis, 10% increase in broadband penetration can lead to a 131% growth in healthcare sector

1 Regression Analysis

Approach for Regression Analysis of Healthcare Sector Growth in Selected Developing Countries

Regression equation $\rightarrow y = 5,427x + 741$



- Out of the 41 countries which had experienced an increase of 10% broadband penetration over the last 10 years, the healthcare spend per capita for 19 developing countries was analysed
- A regression analysis was performed on the data from 12 developing countries (after removing 7 outliers¹) to obtain a regression equation to calculate average spend (\$ in PPP) at each level of broadband penetration
- Based on regression analysis, it was observed that India's healthcare sector could grow from INR 2,892 bn currently to INR 6,689 bn over a 10% increase in broadband penetration

• Healthcare Sector Revenue Growth: **131.3%**

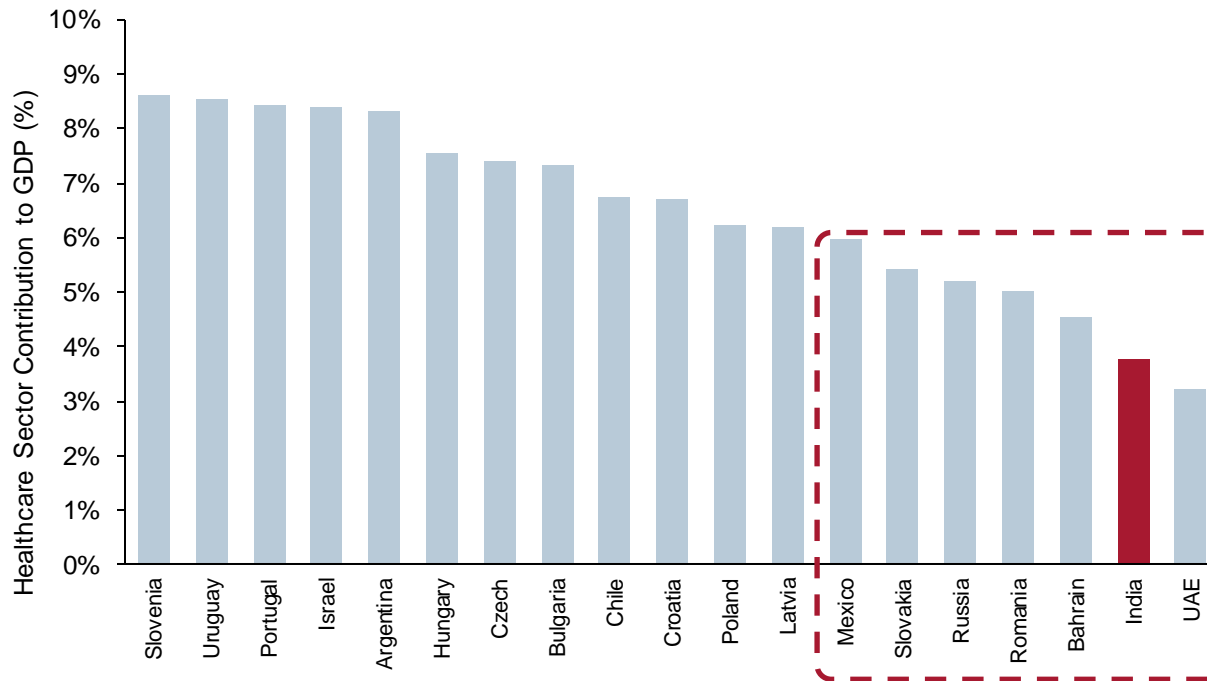
Note: 1. Outliers includes countries with an already high or low spend on healthcare (by PPP)

Source: Analysys Mason, Euromonitor

There are six developing countries which had a contribution of healthcare to GDP ~4%, when broadband penetration was ~1%

2 Benchmarking Analysis

Contribution of Healthcare Sector to GDP at ~1% Broadband Penetration¹ for Selected Developing Countries



- Among developing countries, there are six such countries which, when at a broadband penetration of 0.9%, had observed a c.4% contribution to GDP by their healthcare sector
- Time taken by these countries to witness a c.10% increase in broadband penetration varies between 4 to 7 years

Developing countries which have witnessed at least 10% growth in broadband penetration over 2000-2010²

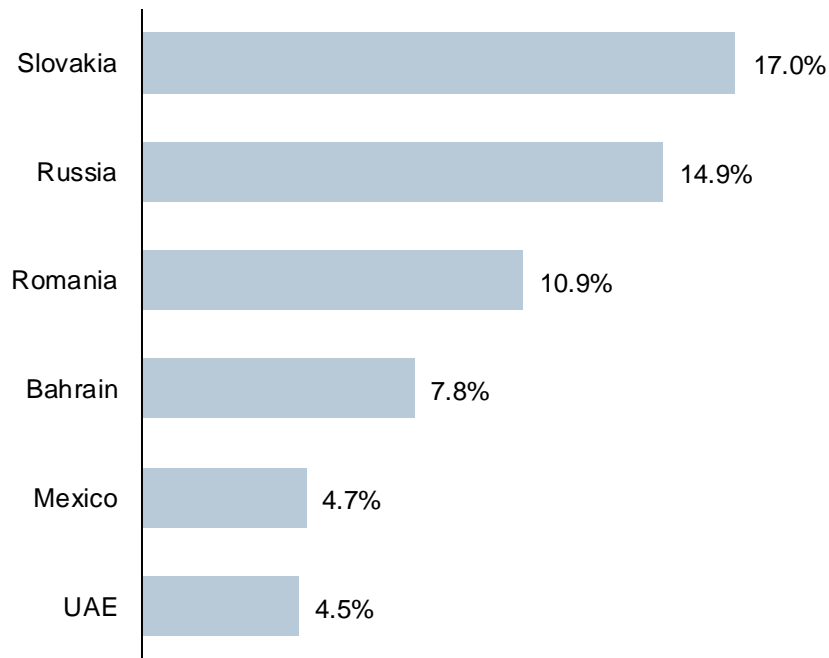
Note: 1. Each country had ~0.9% broadband penetration at different points of time; 2. Duration for 10% increase in broadband penetration could vary for each country

Source: Analysys Mason, Euromonitor

These countries have witnessed 5% - 17% real CAGR in healthcare spend with a 10% increase in BB penetration

2 Benchmarking Analysis

Real CAGR¹ of Healthcare Sector Revenue per Capita with 10% increase in Broadband Penetration



CAGR in real healthcare revenue per capita after adjusting for fluctuations in inflation and currency exchange rate

Healthcare Sector Growth Drivers

- Increase in private investments and industry consolidation for medical infra, resulting in the establishment of specialty hospitals
- Increasing affluence, rising prevalence of lifestyle diseases, as well as increasing incidence of epidemic outbreaks have increased out of pocket spend on healthcare
- Rapid medical inflation, especially in the treatment of cardiovascular diseases, organ transplants and specialist services also contributes to the increase in expenditure
- Governments policy initiatives aim to establish small-scale primary healthcare clinics, national health databases and staff training programs

- Average nominal growth: **15.5%**
- Average real growth (after adjustment for inflation and currency exchange rate): **10%**

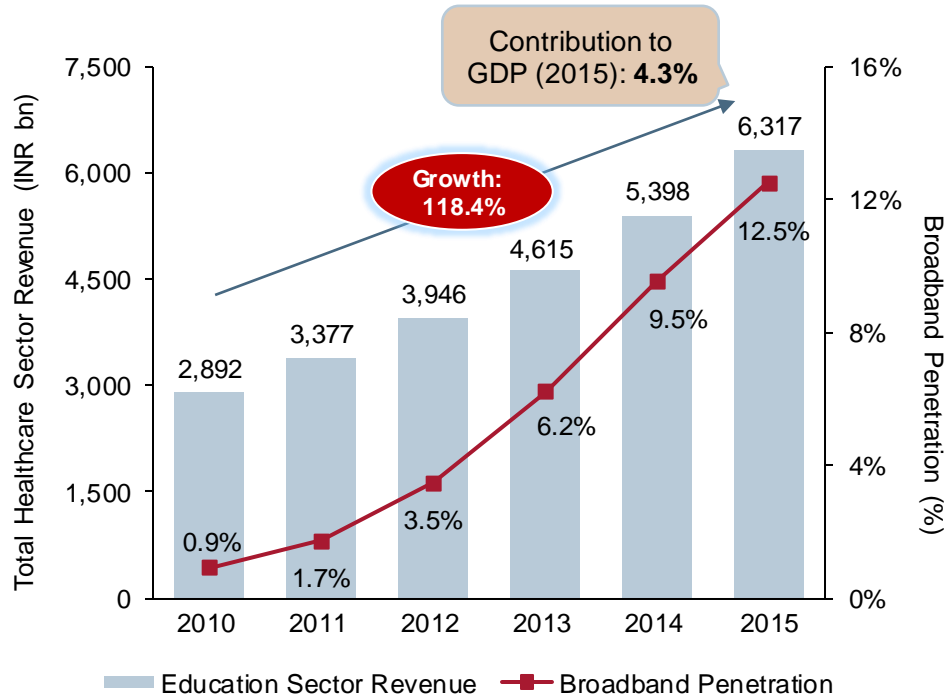
Note: 1. CAGR for period when broadband penetration in that country increased by 10%. Includes growth rate of per capita spend after adjusting for inflation and exchange rate fluctuations

Source: Analysys Mason, Euromonitor

Based on the growth rate analysis of these countries, India is expected to witness 118% growth in healthcare sector revenues

2 Benchmarking Analysis

Growth in Healthcare Sector Revenue (INR bn) with 10% Increase in Broadband Penetration in India



Growth Rate Calculation (2010–2015)

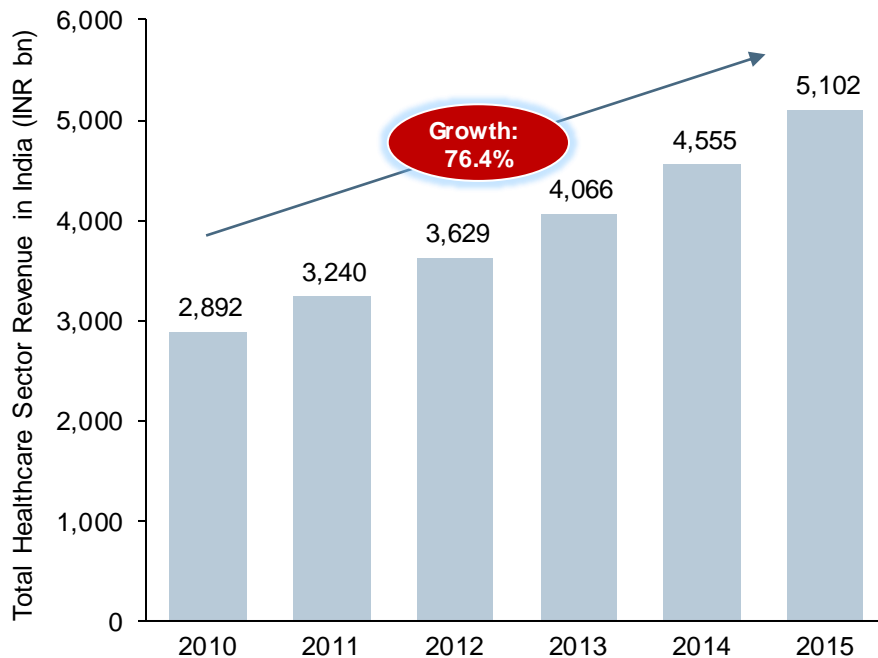
- Real CAGR of per Capita Spend: **10.0%**
- Average inflation from 2010 - 2015: **6.2%**

- Increase in healthcare sector revenue with increase in Broadband penetration will primarily be driven by growth in telemedicine clinics, mobile health monitoring and survey data collection
- Further, this growth will be supported by initiatives by government as well as private players
 - ♦ Policy changes such as allowing FDI for medical equipment, de-regulation of health insurance and budgetary considerations for pharmaceutical and biotech organizations drive growth in this sector
- However, in addition to broadband availability, reliability of broadband access (uptime of 99%) and reduction in service costs will be required to drive growth of telemedicine
- As per XIth five year plan (2007-12), govt. plans to increase its spend on health sector to 2-3% in 2012

Based on historical growth trends, healthcare sector revenue in India is expected to grow by 76% to reach INR 5,102 bn by 2015

3 Base Case Analysis

Healthcare Sector Revenue (INR bn) based on Historical Growth

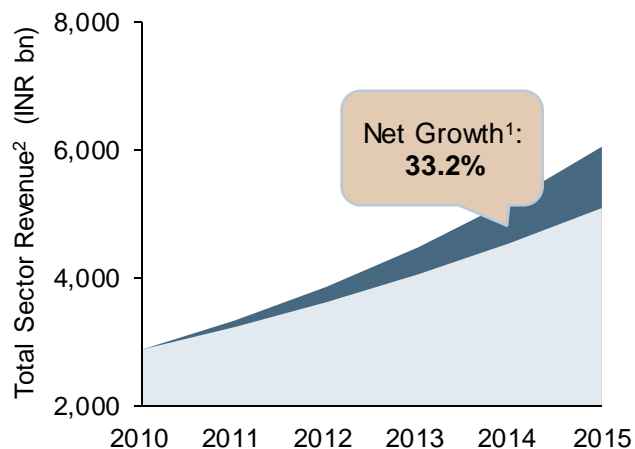


- As per base case analysis, the healthcare sector in India is expected to grow by 76.4% over 2010-2015 to reach INR 5,102 bn
- According to Ministry of Health and Family Welfare, there were 1,78,601 public health institutions (govt. hospitals, HSC, PHC and CHC) and 10,266 private hospitals in India in 2010
- Revenue per health institution is assumed to vary with inflation from 2010 to 2015
- By 2015, the number of number of govt. health institutions are expected to increase to 195,000 while private hospitals are expected to increase to 15,000 resulting in an increase of 76.4% in sector revenues

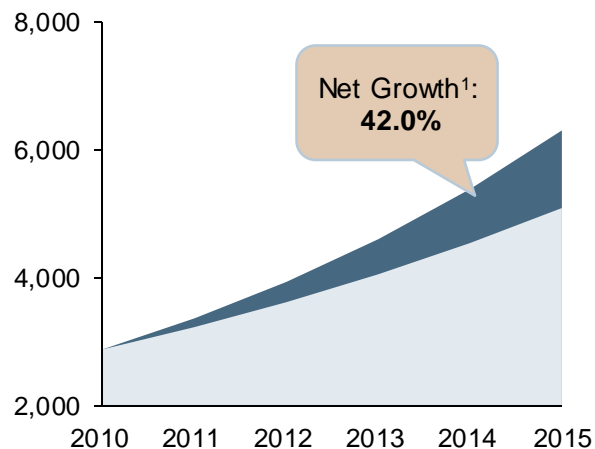
Impact of growth drivers of sector revenue expected to increase with higher increase in broadband penetration in 5 years

Sensitivity Analysis

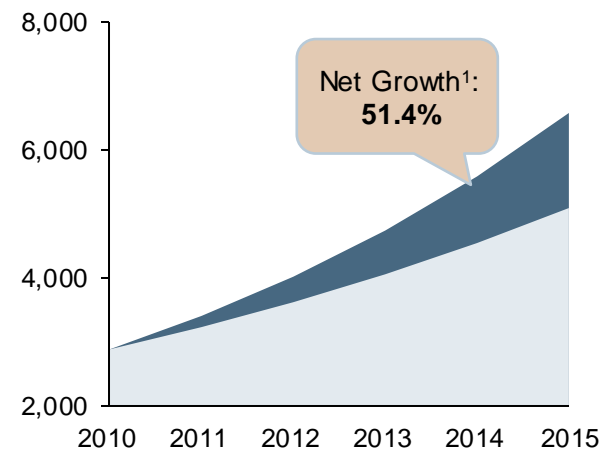
Scenario 1: Broadband Penetration in 2015: 11.5%



Scenario 2: Broadband Penetration in 2015: 12.5%



Scenario 3: Broadband Penetration after 5 Years: 13.5%



■ Sector Revenue with increase in Broadband

■ Sector Revenue based on Base Case Analysis

Growth drivers of healthcare sector revenue, including broadband penetration, are expected to have an increasing impact on revenue with higher broadband penetration in 5 years

Analysys Mason Limited
BD-4th Floor, Netaji Subhash Place
New Delhi – 110034, India
Tel: +91 (0)11 47003100
Fax: +91 (0)11 47003101
www.analysysmason.com