

THE CHALLENGE OF THE DIGITAL DIVIDE IN BRAZIL

WHY BRAZIL NEEDS BROADBAND INTERNET,
AND WHAT TO DO TO ACHIEVE IT

BY RODRIGO PEDROSO LEITE PINTO
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Conteúdo

1.	ABSTRACT.....	2
2.	INFORMATION AND COMMUNICATIONS TECHNOLOGY INDICATORS	2
3.	NECESSARY INVESTMENTS	4
4.	HINDERERS TO THE IMPROVEMENT OF BROADBAND PENETRATION IN BRAZIL.....	6
4.1.	The Brazilian legal framework.....	6
4.2.	The British and the European legal frameworks.....	6
5.	AREAS TO BE ADDRESSED	7
6.	BIBLIOGRAPHY	11
7.	APPENDIX	11

1. ABSTRACT

Since the beginning of the liberalization of the telecom market in the 90's Brazil has become a role model for other developing countries. The International Telecommunications Union points the National Agency of Telecommunications (ANATEL) as an example of regulatory body, seeing with good eyes the whole process that led to the opening of the national market. It is undeniable that the country improved with liberalization, bringing more modern technologies to its market and benefiting from this to develop other areas, like social aid.

The advance of technologies does not halt, and the challenges ahead of Brazil are still demanding. It is always necessary to look for new role models and to keep investing to make good use of the advantages that technology can bring. Otherwise the so urgent social needs will be even harder to be tackled.

This work attempts to identify technologies which, being rare in Brazil, could benefit the internal market. Using international role models, lists process and directives that could allow the country to follow the same path. In the end, it is intended to put in evidence the most attention needed areas in order to achieve the proposed objectives.

2. INFORMATION AND COMMUNICATIONS TECHNOLOGY INDICATORS

2001 was the year when there was a shift on the personal communications model from fixed to mobile, with evidences on the decrease of landline subscriptions in the United States and stagnation in Brazil. The Indian case was even more noticeable, where a strong rise of this index suffered subtle reversion, putting up a burst on the proportion of landlines to mobiles¹.

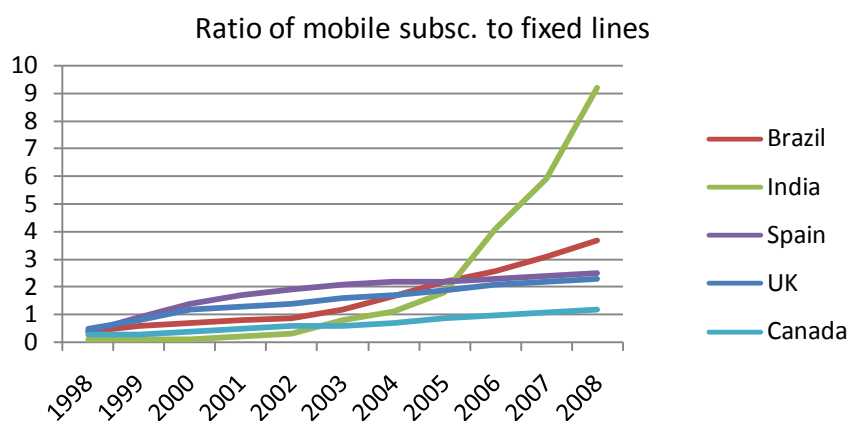


Figure 1. (Source: ITU)

In 2003 Brazil comes out of the curve of the world trend on Internet subscribers, overcoming several other countries, including developed ones. The South-American giant seems to be thirsty for nay new low cost technology that could help its development. When looking at this index it is important to notice two cases amongst the five with greater growth between 1998 and 2008: China and Brazil. China has growth more than twice the United States, which hold the second place.

¹ With data from the International Telecommunications Union, www.itu.org

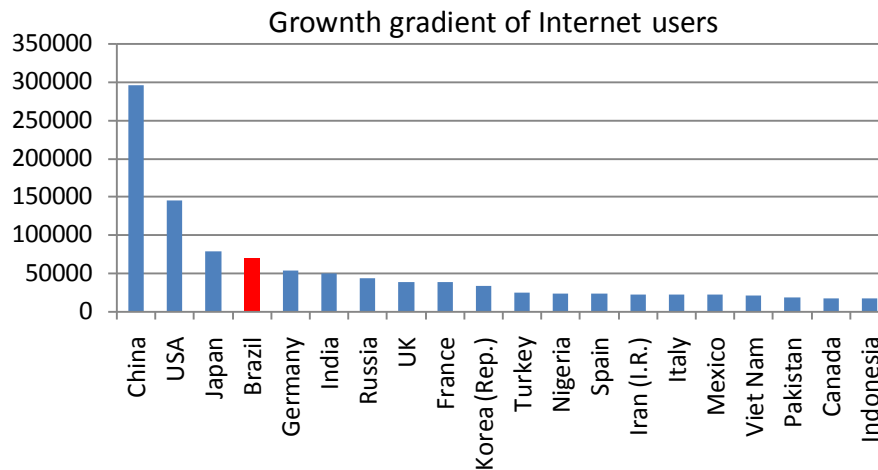


Figure 2. (Source: ITU)

By studying ITU's macroeconomic indicators it is possible to analyze the progress of ICT (Information and Communications Technology) penetration. Privatization in the Brazilian market started on the first half of the decade of 1990. It is impressive how the use of Internet grew at uncommon rates, showing to be stronger in comparison to the mobile subscriptions in Brazil and also when compared to the penetration in other countries.

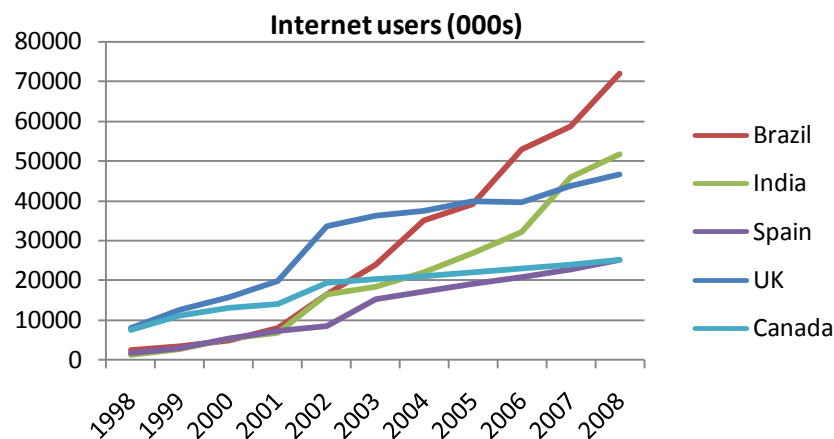


Figure 3. (Source: ITU)

The broadband subscription growth rate as also strong, but not significant in terms of percent numbers. This is an indication that Brazil could take great advantages of this technology if it managed to implement it more effectively.

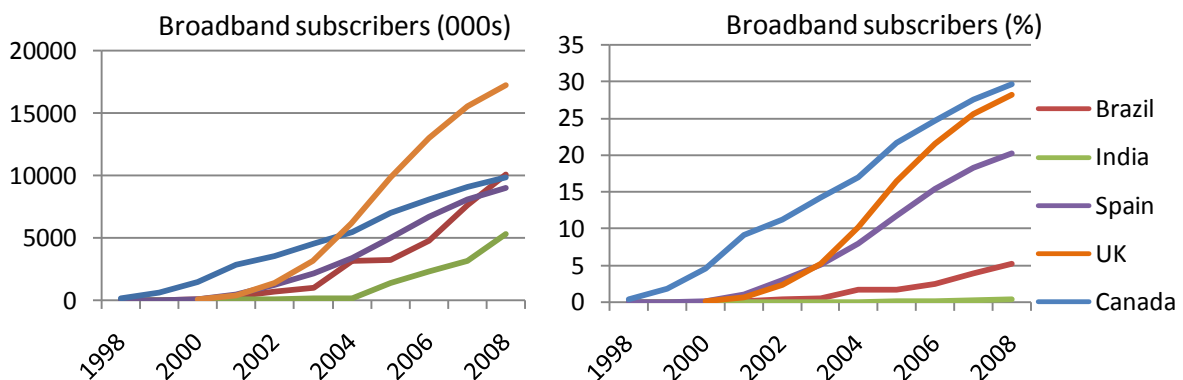


Figure 4. (Source: ITU)

It is interesting to observe that other technologies did not achieved a progression as steep as broadband in Brazil. The amount of mobile phone subscribers, for instance, also experimented an expressive raise after 2005 without, however, keep up with India.

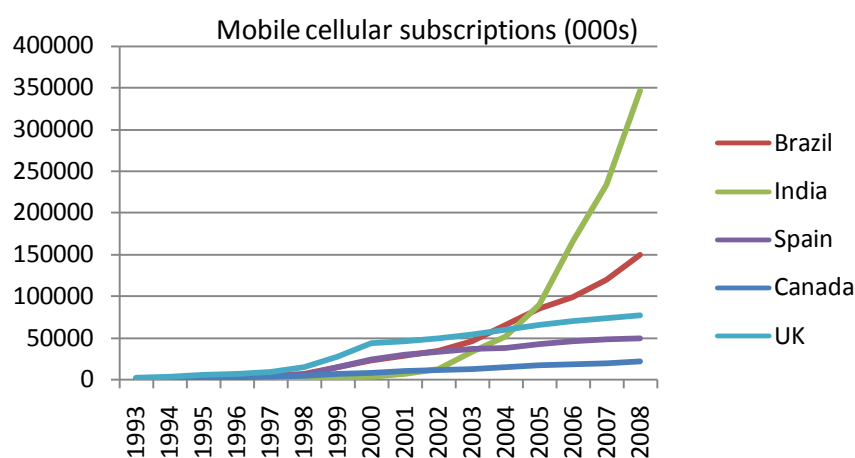


Figure 5. (Source: ITU)

3. NECESSARY INVESTMENTS

There is no recipe for the level of interference a government should have on the implementation of telecommunications services. The right balance between government and private funding depends on several factors and changes along the time. Korea initiated its Internet broadband program leaning towards little sector regulation aiming to achieve market development through free completion, but had to change its policies after aggravation of a worldwide crisis. After signs of stability and improvement the government returned to decrease levels of market regulation².

Before any kind of investment is made in Brazil, it is important to check other ICT indicators. It is crucial to keep in mind, for instance, the extreme and generalized gap in infrastructure. It indicates, among other things, that broadband could be more easily implemented through wireless networks using the private companies' infrastructure. Indeed, this kind of service is already quickly spreading on private funding. But without support, it is done mainly on places with higher income, where expenses with infrastructure are smaller and profits are higher. This is a main issue on the subject of universal services, where the goal is to attend the biggest number of people. But in terms of ICT development there are still other non smaller deficiencies.

At the present rate of development, the absence of broadband Internet in large scale represents a major hinderer to Brazilian growth. To address this problem the example of other countries point towards the necessity, in a first moment, of the implementation of a high capacity backbone, indispensable and enough to allow the transportation of large amount of data at high speeds to every corner of this big country. It is a good thing that such backbone is deployed by the government, but private participation improves, with big advantages, its execution.

Aside the backbone it is necessary to create conditions for sector growth through proper policy development and incentives to private initiative, considering that the costs are too high to be entirely funded by public investments. Korea stands as an international role model on the matter. Examples of Korean actions to build a broadband eco-system³:

² "Building broadband", World Bank. Page 25.

³ "Building broadband", World Bank.

	Promotion	Oversight	Universalization
Ecosystem definition and strategy	Plans	Framework Act on Telecom, Telecom Business Act, Fair Trading Act	Milestone programs
Networks	Backbone, standardization, certifications	Government ownership	Low interest loans
Services	Broadband as value added service, quality service agreements	Regulation policies	Subsidizing
Applications	Tax reductions, R&D, e-government	Intellectual protection, security systems	People with disabilities
Users	Subsidies for computer purchases	Ethics on information	Free Internet access centers, broadband in schools

Table 1. (Source: “Building broadband”, World Bank)

Historically this development was executed on the following sequence:

Framework plans and supporting policies	
Year	Initiative
1992	Information use promotion plan
1998	Multimedia content industry promotion plan
1999-2002	IP and ISP promotion plans
2000	Digital content industry promotion plan
2001	Digital content technologies developed in collaboration with the Ministry of Culture
2001	Internet broadcasting industry promotion plan
2002	Digital multimedia content investment partnership
2003-08	First and second basic plans for online digital content industry advancement

Supporting legislation and bodies	
Year	Initiative
1993	Korea database promotion center created
1997	Korea multimedia content promotion centre created
1998	Korea software industry promotion agency (KIPA) created
2000	Software industry promotion act
2000	Management of digital content act
2002	Online digital contents industry advancement act

Table 2. (Source: “Building broadband”, World Bank)

On the Brazilian side IPEA (Instituto de Pesquisas Econômicas Aplicadas)⁴ points deficiencies on the regulation of costs, prices, quality, access infrastructure and on network unbundling. It points public funding as fundamental to diminish the digital divide among low and high income population. On its report IPEA points as hinderer the delay between foreign and national markets on the subject of technological innovation. The following are identified as trends: faster data connections, greater mobility, flexibility on the creation of services, new TI applications, and location and automation services.

On the Korean timetable present above it is interesting to notice that the evolution of legislation did not cease throughout the process, with several new laws being created on the last years. This is the materialization of the concept of legal review pointed before.

⁴ “Comunicado 46” (2010), IPEA. Pages 3 to 5.

4. HINDERERS TO THE IMPROVEMENT OF BROADBAND PENETRATION IN BRAZIL

4.1. The Brazilian legal framework

When comparing the Brazilian framework to the well succeeded international example, it is easy to see the national deficiencies in infrastructure, private initiative fostering policies, tax policies and legislation.

The Brazilian legal framework for ICTs is⁵:

- Law 9,472 of July 16th 1997: The General Telecommunication Act;
- Resolution 73 of November 25th 1998: The Telecom Services Regulation;
- Attachment to Resolution 272 of August 9th 2001: The Multimedia Communications Service Regulation;
- Service related regulations and plans;
- Authorization terms celebrated between service providers and the National Agency of Telecommunications (ANATEL).

The General Telecommunications Act was made focusing on telephony. It contains no prediction for the regulation, control or dispositions of services as fixed or mobile broadband. There is a whole chapter regarding the use of radiofrequencies, another part on satellites and its orbits, but nothing about the speed of World Wide Web interconnection speeds, for example.

It is a legal figure pointed at regulating the important privatization process that took place in Brazil in 1995. There was a big concern in creating the elements for market competition, liberalization and ordered growth following the recommendations of international authorities, like the ITU.

At the same time as the definition of a legal framework is vital to foster ICT's market growth, aside that technological development advances at large steps, challenging any legal models created for its own support. The failure in comprehending the prediction for novelty can change the legal framework into a restrain in few years.

4.2. The British and the European legal frameworks

The challenge of sustaining ICT development keeping pace with its growth rate was addressed on several different ways around the globe. Britain has as main legal foundations on this area the Broadcasting Act 1990, the Competition Act 1998, the Communications Act 2003, the Wireless Telegraphy Act 2006 and several directives. Among them, the most relevant was the Telecommunications Act, which implemented market liberalization.

The decade of 1990 was of intense production for the European regulatory authorities. This work resulted in highly competitive markets, but also produced a vast amount of paperwork: directives on satellites, mobile phones, cables, regulations on licensing, GSM, UMTS, emergency numbers and several other technocratic subjects. Until in 1999 it was made a regroup of legal devices leading to the following main topics⁶:

- Liberalization Directive
- Framework Directive
- Licensing & Authorizations Directive
- Access and Interconnection Directive
- Universal Service Directive
- Telecoms Data Protection Directive

This evolution in telecom regulation culminated on the Communications Act 2003, which was a fundamental advance of the British regulatory model. Made in great part to absorb the new European directives, it was built with an effort to avoid great specificity, with the intention of not attending the

⁵ ANATEL (2010): www.anatel.gov.br

⁶ "Telecommunications Law". Page 35

technology available at that time. The change in the name of the Act is an example of this will – “tele” was dropped from “telecommunications” so that a broader significance could be implied. When defining electronic communications network, for instance, the European directives dissert on a long list of equipments, propagation modes and kind of information sent, while the British Act defines it as a transmission medium of any kind, made by any equipment, for the communication of data of any nature⁷. Even more than the European directives that gave it form, the Communications Act was broad and comprehensive with the fast transforming pace of the sector.

But more important than the legal details themselves, Lloyd & Mellor⁸ point certain principles that should be followed on the definition of the telecommunications legal framework:

- “Regulation should be limited to what is strictly necessary to achieve clearly identified objective;
- Regulation should be responsive to the needs of users;
- Regulation should be based on a clear and predictable framework”;
- Full participation in a converged environment should be pursued;
- “Independent and effective regulators are essential components of a new regulatory schema”.

5. AREAS TO BE ADDRESSED

In a task as complex as the installation of a high capacity network to attend a country of continental dimensions, with large rural areas, building at the same time a competitive and economically viable market, difficulties abounds. In a report from the World Bank, Mark Williams⁹ sees two fields that need to be developed for this end: the liberalization of the market with the creation of a competitive environment, and the stimulation to the roll-out in underserved areas. He divides these two fields into several items:

- Create an enabling environment for infrastructure competition
 - Remove regulatory obstacles to investment and competition
 - ✓ Remove limits on the number of network licenses
 - ✓ Encourage the entry of alternative infrastructure providers
 - ✓ Remove constrains on the backbone services market
 - ✓ Improve the regulation of backbone networks
 - Reduce the cost of investment
 - ✓ Facilitate access to passive infrastructure
 - ✓ Promote infrastructure-sharing
 - Reduce political and commercial risks
 - ✓ Risk guarantees and political risk insurance
 - ✓ Demand aggregation
 - Promote effective competition in the downstream market
 - ✓ Promote downstream competition through effective regulation
- Stimulate roll-out in underserved areas
 - Competitive subsidy models
 - Shared infrastructure / consortium models
 - Incentive-based private-sector models

In developed countries the deployment of the data network’s backbone was done, in great part, by the incumbent. Fomented by government subsidies and universal service objectives, the incumbents spread their networks to the maximum. Market competition made other operators, instead of building parallel networks, to buy the right of usage of existing networks to provide their services. In consequence of the law of supply and demand, such competitors characteristically concentrated on populated and richer areas, with lower infrastructure expanses and larger profits.

⁷ “Telecommunications Law”. Page 41.

⁸ Telecommunications Law”.Page 28

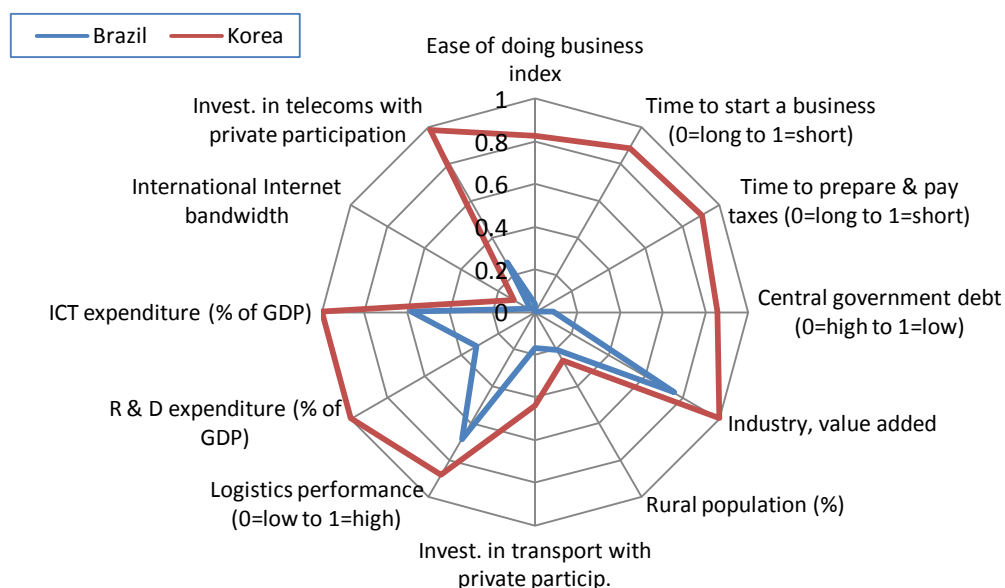
⁹ “Broadband for Africa”, World Bank. Page 28.

In the United States this model achieved even better results than in Europe, mostly because of a more efficient regulation and better application of the laws that protect workers' rights¹⁰.

In a country as big as Brazil such disparity would be even more accentuated. For that reason the second topic listed by the World Bank before – stimulate roll-out in underserved areas – requires special attention. Again Korea poses as role model to solve this kind of problem. A solution was achieved through a concept called demand of aggregation.

Korea¹¹ executed the demand of aggregation model with investments in network infrastructure and emission of operating licenses to new private entrants, imposing the demand for continuity of investments. With this strategy the country spent US\$ 0.2 billion of US\$ 2.2 billion of the costs of an optic fiber network, US\$ 0.3 billion out of US\$ 7.3 billion for access networks, and US\$ 0.4 billion of US\$ 24 billion for investments on updating and network improvement. The initial investments were made to attract private companies. It resulted on the construction of a widespread and modern network which received investments for a long period.

Following this reasoning to analyze the Brazilian case, some deficiencies come to surface. Data from the World Bank¹² allows putting these discrepancies into perspective.



¹⁰ Broadband and the economy”, OECD. Page 16.

¹¹ “Building broadband”, World Bank.

¹² Selection of indexes from the Word Bank in <http://econ.worldbank.org>. For a description of the indexes and notes on normalizations, see Appendix.

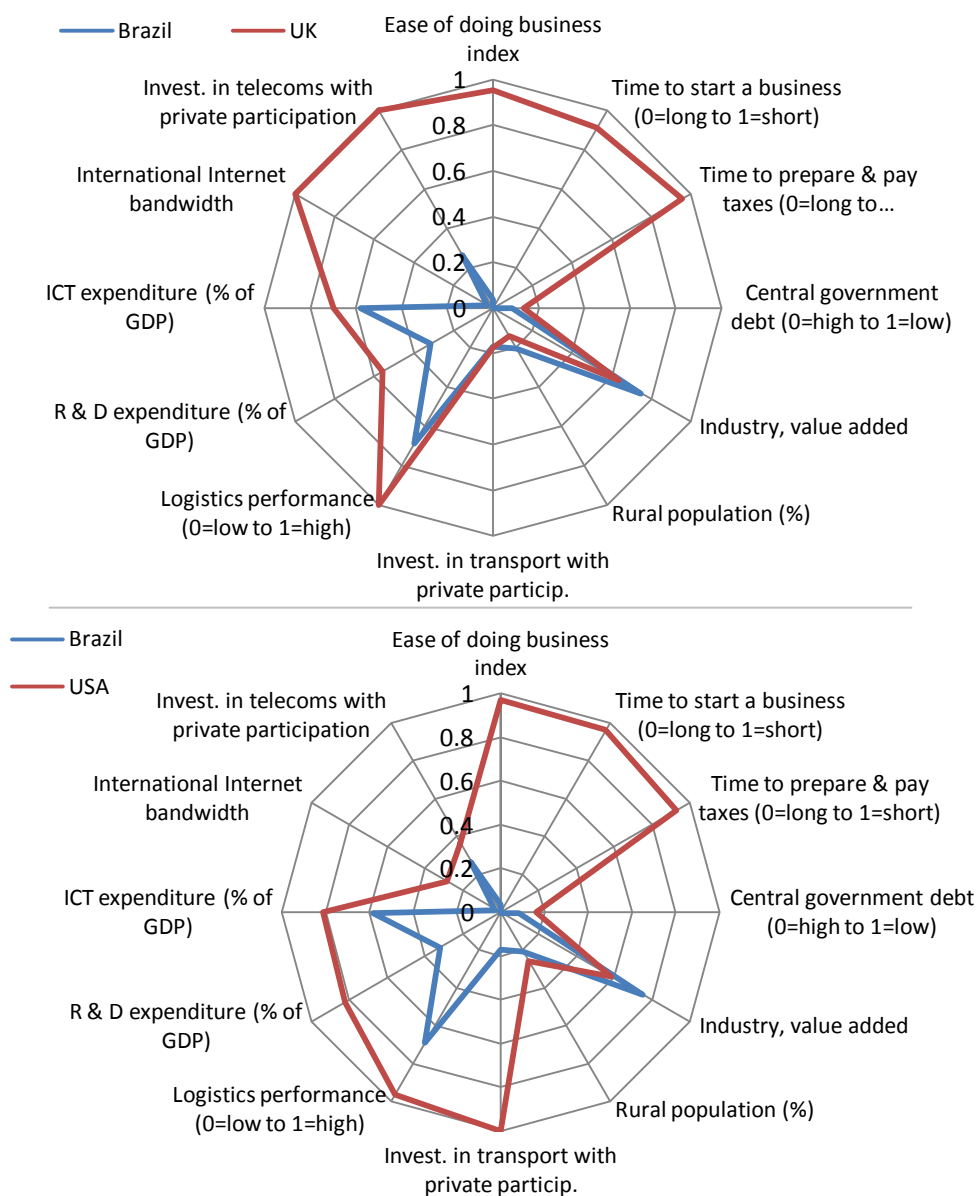


Figure 6. (Source: World Bank)

The chart below shows average investments in ICT versus Internet subscribers (selection of countries)¹³.

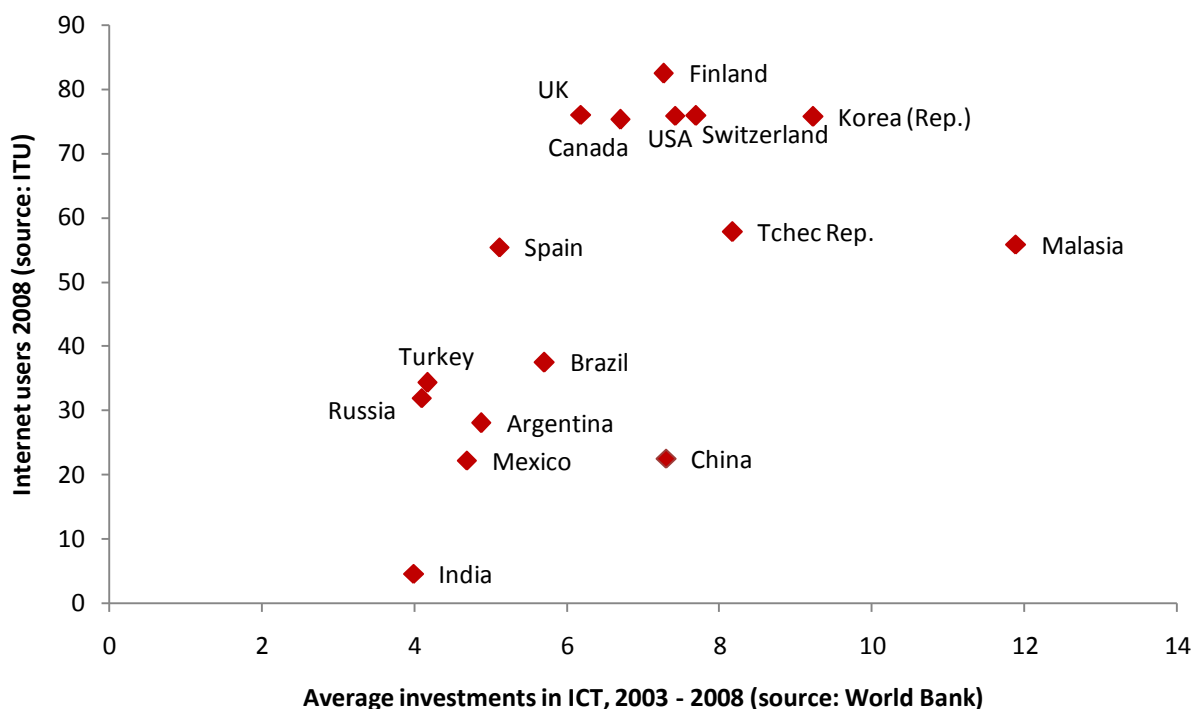


Figure 7. (Source: The World Bank and ITU)

With these it can be seen a deficiency both in ICT indicators as in infrastructure and social areas. It is not going to be without investments in all these areas that the technological leap, which is so important to the country now, will be achieved.

¹³ Data from the World Bank (investments in ICT) and from ITU (Internet subscribers). See data table and comments in Appendix.

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7. APPENDIX

From Figure 5: selection of indexes of the World Bank in <http://econ.worldbank.org>.

Indicador (por extenso)	Brasil	Argentina	Russia	India	Korea
Índice de facilidade para abrir negócio (1 = maior facilidade)	127.00	112.00	118.00	132.00	23.00
Tempo necessário para abrir negócio (0=curto a 1=longo)	5.28	4.83	3.46	4.49	9.07
Tempo necessário para pagar impostos (0=curto a 1=longo)	1049.34	2320.38	572.62	31.78	4528.34
Dívida interna, total (1=alta a 0=baixa)	4.93	7.65	7.60	13.76	18.16
Indústria, valor adicionado (% do PIB)	1.02	0.49	1.07	0.79	3.22
População rural (% do total)	14.42	8.00	27.16	70.46	18.54
Investimentos em transporte com participação privada (em dólares)	152.00	32.00	30.00	30.00	17.00
Índice de performance de logística (0=baixo a 1=alto)	2600.00	453.00	448.00	271.00	250.00
Gastos com pesquisa e desenvolvimento (% do PIB)	60.88	#N/D	6.43	57.55	9.58
Gastos com Tecnologia da Informação e Comunicação (% do PIB)	27.96	32.28	37.23	28.83	37.14
Banda internacional de Internet (bits por pessoa)	6878901.00	1997146.00	3303337.00	6623256.00	17773714.00
Investimentos em telecom com participação privada (em dólares)	2.75	2.98	2.37	3.07	3.52

Indicador (por extenso)	Reino Unido	França	Espanha	EUA	Min	Max
Índice de facilidade para abrir negócio (1 = maior facilidade)	6.00	31.00	51.00	4.00	4.00	132.00
Tempo necessário para abrir negócio (0=curto a 1=longo)	6.34	5.17	4.79	7.36	3.46	9.07
Tempo necessário para pagar impostos (0=curto a 1=longo)	39647.92	29356.22	11008.06	11289.49	31.78	39647.92
Dívida interna, total (1=alta a 0=baixa)	18.44	10.78	15.47	6.75	4.93	18.44
Indústria, valor adicionado (% do PIB)	1.80	2.12	1.21	2.65	0.49	3.22
População rural (% do total)	10.06	22.64	22.88	18.30	8.00	70.46
Investimentos em transporte com participação privada (em dólares)	13.00	7.00	47.00	6.00	6.00	152.00
Índice de performance de logística (0=baixo a 1=alto)	105.00	132.00	234.00	187.00	105.00	2600.00
Gastos com pesquisa e desenvolvimento (% do PIB)	57.52	66.57	33.80	55.66	6.43	66.57
Gastos com Tecnologia da Informação e Comunicação (% do PIB)	23.72	20.45	28.89	21.80	20.45	37.23
Banda internacional de Internet (bits por pessoa)	7081468.00	4619008.00	13248084.00	40345270.00	1997146.00	40345270.00
Investimentos em telecom com participação privada (em dólares)	3.99	3.76	3.52	3.84	2.37	3.99

From Figure 6: data for the graphic of investments in ICT per Internet subscribers:

País	2003	2004	2005	2006	2007	2008	Média (2003 a 2008)	Internet
Malásia	12.8282843	13.4192014	12.0467677	12.2326664	11.049164	9.7040153	11.88001652	55.7999998
Hungary	9.9922578	10.2674863	10.4294161	10.7587977	9.7743619	8.9000662	10.02039767	58.5080594
Jordan	10.2040298	10.5598477	10.1014383	8.9757331	8.3132537	7.2776061	9.23865145	27.0104711
Coréia (rep.)	8.9703417	9.478053	9.2121964	9.4147006	9.195575	9.0713307	9.223699567	75.7853807
Senegal	6.5331709	7.6848301	9.0123672	10.4176339	10.6106405	10.7533847	9.168671217	8.3530004
South Africa	7.9890243	8.0049737	9.4917667	9.797906	9.4479631	10.0983308	9.138327433	8.5998316
Singapore	10.0982546	9.704553	9.5597562	8.7244355	7.526966	7.0830767	8.782840333	69.6367318
Morocco	5.3322693	6.6640349	7.5090015	7.4421815	9.998108	12.4503286	8.232653967	33.0400015
Rep. Tcheca	8.1553367	8.2674606	8.3153483	8.4040499	8.2422557	7.5959475	8.163399783	57.8237885
Hong Kong	6.2812717	7.0064507	7.8223121	8.1662816	9.4017464	9.1998416	7.979650683	67.0440116
Sulça	7.3980289	7.6860573	8.1651151	7.9661411	7.7081514	7.1871867	7.685113417	75.9289588
EUA	7.5053456	7.501251	7.4095771	7.3666637	7.3372699	7.3612293	7.4135561	75.8501612
China	7.8789805	7.9943702	7.9051945	7.4527781	6.5729613	5.9669567	7.295206883	22.4964236
Finland	6.9161276	7.5604621	7.6108191	7.7393794	7.2528114	6.5152508	7.2658084	82.4839618
Ukraine	6.7615832	7.8919756	8.1491169	8.0788712	6.7803432	5.9264664	7.264726083	10.5390828
Honduras	5.1256954	5.9568471	6.4016283	7.2034057	7.8955995	8.5994815	6.86377625	13.0895972
Bulgaria	6.9923569	6.7718368	7.2121951	7.0961127	6.6431065	6.3044972	6.8366842	34.7228499
Netherlands, The	6.7700444	6.8046928	7.0952663	7.2064276	6.6964891	6.2938262	6.8111244	86.9813573
Japan	6.7140417	6.5966843	6.6940876	7.0027418	6.8778173	6.6870576	6.762071717	75.157389
Canada	6.9541521	6.9159846	6.6691834	6.4768257	6.5712186	6.6047863	6.698691783	75.3075524
Costa Rica	6.2170553	6.9462707	6.1985845	6.9452765	6.24631	6.1678773	6.453562383	32.307132
Vietnam	7.4885303	7.2745785	6.7377549	6.3574289	5.9267589	4.85439	6.439906917	24.1663511
United Kingdom	6.2770058	6.2531098	6.1201319	6.0637863	6.0278713	6.3356518	6.179592817	76.0150013
Portugal	5.870051	6.1210207	6.4372239	6.3551336	6.1789375	5.9861568	6.15808725	42.1348709
Sweden	6.3952155	6.2678696	6.235531	6.2441171	5.8181994	5.7480967	6.11817155	67.6986805
Thailand	5.811984	6.190374	6.1109472	6.1595209	6.0673226	6.2025755	6.090454033	23.8920673
Poland	5.7049393	6.3330359	6.0664104	6.2825804	5.7714775	5.5020748	5.943419717	48.9934482
Austria	5.9304573	6.0049585	6.0866079	6.2076524	5.8508891	5.4915872	5.928692067	71.2093762
Israel	6.0185496	6.2589871	6.126486	6.0271387	5.7135734	5.3915822	5.9227195	47.8874781
Panamá	5.4513741	6.6942441	5.6417931	5.9888184	5.9704748	5.467928	5.869105417	27.493547
Australia	6.4629514	6.0268437	5.8805123	5.865927	5.8250107	4.9280317	5.831546133	70.7826687
Germany	5.7788387	5.8636888	5.8994475	6.0111811	5.5721815	5.3927728	5.7530184	75.4756093
Brasil	5.6981634	6.2205846	5.860191	5.6691054	5.4615631	5.2802006	5.69830135	37.5199932
Philippines	5.0341049	6.0143583	5.340766	5.3945617	5.8727138	6.1165959	5.6288501	6.2181485
Bolivia	6.0583322	6.0759017	5.9103179	5.2309757	5.0598148	4.8610356	5.53272965	10.8313159
Kenya	5.4287897	5.4578659	5.8411311	5.1535143	5.5493102	5.7520456	5.5304428	8.6663871
France	5.5666137	5.5304308	5.6236884	5.7826382	5.4541006	5.1712519	5.521453933	67.9466424
Slovak Republic	4.798697	4.6233735	5.4395642	5.874823	6.0758202	6.1901782	5.5004548	65.9647995
New Zealand	5.6728545	5.4863965	5.5060287	5.5042414	5.1373376	5.4745126	5.463561883	71.3767013
Belgium	5.4773897	5.3553425	5.5094267	5.4500276	5.2539417	5.1645887	5.368452817	68.0982082
United Arab Emirates	5.8048795	5.7488741	5.2202655	4.9824452	4.880643	-	5.32742146	65.1514559
Tunisia	4.2744672	5.0873639	5.4223931	5.7297959	5.6972784	5.4497645	5.276843833	27.1112919
Bangladesh	1.9334966	2.4125225	4.0697611	5.8613819	8.0382427	9.0381636	5.225594733	0.3474997
Italy	5.1456682	5.2591016	5.3300659	5.4834876	5.130882	4.9498046	5.21650165	41.7693997
Denmark	5.1843563	5.1477591	5.3160644	5.4739179	5.1479622	5.0119012	5.213660183	83.3443552
Espanha	5.6116824	5.0166816	5.2056608	5.191538	4.8756664	4.7931934	5.1157371	55.4046654
Saudi Arabia	5.0953396	5.0217876	4.8087605	4.9241476	5.4197294	5.1768356	5.074433383	31.4933779
Egypt, Arab Rep.	3.962401	4.6929752	5.3163935	5.3579835	5.2298248	5.6994491	5.043171183	16.648431
Ecuador	3.9085195	3.7905544	5.7315055	5.5937634	5.5434129	5.2624336	4.971698217	28.7951777
Romania	4.8871402	4.9943622	4.7432028	4.9319382	4.913972	4.912401	4.8971694	28.79464
Argentina	4.2461224	5.0504063	4.5656004	5.3740965	5.1874828	4.8277235	4.87523865	28.1126235
Chile	4.6694872	4.6102165	4.7266154	4.6754904	4.850201	5.1091175	4.773521333	32.4699987
Ireland	4.8648487	4.8880316	4.8028958	4.813873	4.514066	4.5972501	4.746827533	62.7010795
México	4.5980174	4.7058148	4.8308582	4.7444446	4.6827406	4.5516976	4.685595533	22.1601297
Greece	4.9390682	4.6801368	4.2714816	4.5786272	4.5255942	4.5405283	4.589239383	43.1126544
Uruguay	4.136888	4.2306002	5.250603	4.8746863	4.649861	4.3012982	4.57398945	40.1913348
Colombia	4.0180525	4.5748459	4.4072339	4.8634646	4.7306735	4.6974559	4.54862105	38.4999979
Slovenia	3.392456	3.8939472	4.4323274	4.8938806	4.7448288	4.724527	4.3469945	55.6901049
Jamaica	5.9881755	4.9821427	3.9077859	3.7680369	3.5988107	3.2740701	4.2531703	57.3087228
Turquia	4.5268431	4.2225253	4.1692082	4.0650758	3.9624605	4.058404	4.167419483	34.3713784
Rússia	4.2343457	4.4596362	4.332551	4.2367145	3.8181657	3.4565358	4.0897755	31.8774216
Norway	4.2357745	4.3477789	4.1815462	4.065587	3.8980678	3.6504546	4.063203183	82.5219181
Cameroon	3.518002	3.7744017	3.9512901	3.876309	4.2214588	4.6218042	3.993877633	3.7981212
Índia	3.1643322	3.8335913	4.3643475	4.1304504	3.9389394	4.48604	3.986283467	4.5396133
Kuwait	4.727567	4.7113686	3.9168795	3.541228	3.5327895	3.2380122	3.9446408	36.6563427
Pakistan	3.1683982	3.3283803	3.8702787	4.1723045	4.3579206	4.366275	3.87725955	11.1370985
Nigeria	4.0261021	3.9662311	4.0283488	3.3206509	3.3819192	3.0885073	3.635293233	15.859558
Venezuela, R.B. de	3.14117	3.1799148	3.6670926	4.0368537	3.9399758	3.5285168	3.58225395	25.6573295
Sri Lanka	2.404099	2.6978864	3.2724345	3.8082649	4.5730926	4.3446953	3.51674545	5.7723864
Indonésia	3.1388089	3.3399963	3.3421051	3.1989533	3.2459365	3.2906567	3.259409467	7.9174794
Peru	3.0895432	2.9452033	3.0805126	2.9073789	3.1558136	3.4295806	3.1013387	24.7197079
Iran, Islamic Rep. of	2.4141418	2.6109017	2.6854431	3.2343027	3.4916683	-	2.88729152	31.9638351
Algeria	2.3874979	2.4539782	2.6408151	2.5165829	2.4801426	2.3106511	2.464944633	11.9278189
Zimbabwe	3.5823728	1.5172157	2.2609289	-	-	-	2.4535058	11.4018599

Indexes:

Index (short)	Index (long)
Ease of doing business index (1=most business-friendly)	Ease of doing business index (1=most business-friendly regulations)
Time to start a business (0=long to 1=short)	Time required to start a business (0=short to 1=long)
Time to prepare & pay taxes (0=long to 1=short)	Time to prepare and pay taxes (0=short to 1=long)
Central government debt (0=high to 1=low)	Central government debt, total (0=high to 1=low)
Industry, value added	Industry, value added (% of GDP)
Rural population (%)	Rural population (% of total population)
Invest. in transport with private particip.	Investment in transport with private participation (current US\$)
Logistics performance (0=low to 1=high)	Logistics performance index: Overall (0=low to 1=high)
R & D expenditure (% of GDP)	Research and development expenditure (% of GDP)
ICT expenditure (% of GDP)	Information and communication technology expenditure (% of GDP)
International Internet bandwidth	International Internet bandwidth (bits per person)
Invest. in telecoms with private participation	Investment in telecoms with private participation (current US\$)

Description: Information and communications technology expenditures include computer hardware (computers, storage devices, printers, and other peripherals); computer software (operating systems, programming tools, utilities, applications, and internal software development); computer services (information technology consulting, computer and network systems integration, Web hosting, data processing services, and other services); and communications services (voice and data communications services) and wired and wireless communications equipment. Source: World Information Technology and Services Alliance, Digital Planet: The Global Information Economy, and Global Insight, Inc.