

# **Assessment of barriers to trade in services: The Services Trade Restrictiveness Index for telecommunications services in Egypt**

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### **Abstract**

This paper estimates a Services Trade Restrictiveness Index (STRI) for fixed, mobile and internet telecommunications in Egypt. The methodology is based on the direct approach of quantifying barriers to trade in services. The paper suggests some modifications to the content of the STRI, applying a number of policy measures included in the current OECD Services Trade Regulatory Database to the case of Egypt for a more accurate assessment of regulatory and transparency-related barriers that affect commercial establishment. The paper also suggests some enhancements to the assessment and scoring of the different policy measures to provide more accurate results.

### **Keywords**

Egypt, Services Trade Restrictiveness Index, telecommunications, trade, investment, regulation

## **1. Introduction**

Services play an important role in integrating the world economy: they contribute largely to growth, employment and trade. Backbone services -such as telecommunications, transport and other infrastructure services- are gaining an increasing importance in facilitating trade, and have gradually become major determinants of performance and competitiveness of any economy. This category of services is a critical input into the production and trade of other goods and services. Cheaper and more efficient provision of backbone services imply increased productivity and lower costs of the provision and trade in all sectors that require the use of these services. Direct and indirect benefits from more efficient production of services in general, and backbone services in particular, represent a major potential asset for developing countries, helping these to produce, trade and specialize more efficiently.

Contrary to traditional cross-border trade in goods, trade in services takes different forms or “modes of supply”, where trade and provision often overlap. Trade in telecommunications, for example, is mainly based on internal provision through commercial establishment and movement of technical experts. Impediments to trade in such services are therefore mostly non-tariff-barriers, such as restrictive or inefficient internal regulations on commercial establishment and migration policies. Given the qualitative nature of such impediments to trade and/or provision of services, their assessment becomes a challenge. In this context, several approaches to transform qualitative barriers to trade in services into some measurable indicator were suggested and are subject to continuous enhancement.

This paper reviews the main contributions to the “direct approach” used to quantify barriers to trade in services, and applies a number of methodological enhancements suggested by the ongoing OECD Services Trade Restrictiveness Index (STRI) Project to the case of the telecommunications sector in Egypt. The paper estimates the STRI for fixed, mobile and internet telecommunications in Egypt and introduces a number of enhancements to the structure and content of the index, based on broader database and more sector- specific components. The interest of the study is to introduce new types of barriers that have not been considered in previous studies on Egypt, and to rely on more accurate information to provide a more precise STRI.

The paper is organized as follows: section 2 reviews the direct approach to quantify barriers to trade in services, focusing on the main recent contributions to the approach, such as the OECD and World Bank projects, as well as the most relevant studies on Egypt. Section 3 provides a short overview of the regulatory framework of telecommunications and the performance of fixed, mobile and internet markets in Egypt. In section 4, the methodology and basic components of the STRI for the three telecom subsectors are explained. The results are analyzed and compared to results of previous studies in section 5. Finally, section 6 concludes and provides main policy recommendations and suggestions for further research and methodological improvements.

## **2. The direct approach for measuring barriers to trade in services: review**

The direct approach is based on the translation of qualitative information about barriers to trade in services into a quantitative index. This generally requires a number of steps: in a first step, information about restrictions on trade and/or FDI in each of the studied countries and sectors is drawn from a variety of sources (GATS commitments, international organizations, national trade agencies, and domestic laws). Second, restrictions are assigned scores that reflect their level of restrictiveness (mostly ranging from 0 to 1, where a completely closed market receives a score of 1 and a fully open market receives a score of 0). Third, these restrictions are grouped into categories and assigned relative weights according to their impact on economic efficiency. Finally, the value of the index is the weighted sum of scores.

The direct approach was initiated by Hoekman (1995) where indicators of openness - so-called "frequency-ratios"- are constructed to assess barriers listed under the GATS schedules of specific commitments for 97 countries and 155 services sectors and sub-sectors. Simple scoring and weighing systems are designed to evaluate the degree of openness of each sector/subsector and the relative importance of the types of barriers listed under the GATS commitments respectively. A number of studies have further enhanced the Hoekman methodology. A sector specific study by Marko (1998) provides frequency indices to evaluate the Basic Telecommunication Agreement (BTA) commitments for a set of 69 countries. A more elaborate indicator is estimated for a subset of 15 countries, where an enhanced scoring system is designed to evaluate different levels of partial liberalization. Following Hoekman's methodology, but using richer information on trade policy and actual regulation, Hardin and Holmes (1997) and

Holmes and Hardin (2000) assess restrictions on foreign direct investment for 15 APEC countries and 11 service sectors, using more a complicated weighing scheme to evaluate the different types of restrictions. A more complex methodology has been developed by a joint Australian Productivity Commission (APC) - Australian National University (ANU) project, where additional information and more complex weighing and scoring schemes are used to estimate “restrictiveness indices” for telecoms, banking, maritime transport, education, distribution and professional services. In the case of telecommunications, Warren (2000) designs a set of 5 restrictiveness indices based on a 1998 ITU survey on domestic regulations and the degree of competition prevailing in 136 telecom markets. These indices are designed to measure limitations on Market Access and deviations from National Treatment for cross-border trade and commercial presence for fixed and mobile communications. The APC- ANU approach has been extended by Dee (2003) to evaluate restrictiveness of banking, telecom, distribution and professional services in Southeast European Countries, and by Dihel and Kalinova (2004) to banking and telecom sectors for a group of European transition economies.

The OECD and the World Bank have recently carried out two separate projects that aim at developing a trade restrictiveness database and corresponding trade restrictiveness indices for a comprehensive set of countries. The OECD “Services Trade Restrictiveness Index” (STRI) Project was officially launched in 2008, and is based on previous OECD studies, completed by additional research and methodological enhancements that aim at creating an exhaustive database for impediments to trade in OECD countries and their corresponding restrictiveness indicators for telecom, computer, construction, professional, transport, distribution and audiovisual services (OECD, 2011). A number of previous studies have contributed to the creation of the current database and the methodological enhancements: An early study by Boylaud and Nicoletti (2001) constructs restrictiveness indices for the telecom sector in 23 OECD countries. This study adopts a similar approach to Warren (2000), yet, does not evaluate restrictions from a strict GATS perspective. Alternatively, the study creates a set of indicators to measure the prevailing degree of competition, state ownership and market openness, in addition to prospective privatization and liberalization commitments. A number of subsequent studies compute more elaborate restrictiveness indices for a larger number of countries and sectors. An important study by Koyama and Golub (2006) constructs a “regulatory FDI index” for a set of OECD plus 13 non-OECD countries, covering business, distribution, construction, financial,

transport, tourism, telecom, electricity and manufacturing sectors. This index measures regulatory barriers that are discriminatively imposed on foreign investors (therefore considered as deviations from National Treatment rather than limitations on Market Access), such as restrictions on foreign equity participation, screening and approval procedures and restrictions on the movement of people. Methodological improvements are provided by Dihel and Shepherd (2007), where a more advanced “trade-restrictiveness index” (TRI) is computed for banking and insurance, telecommunications, distribution and professional services in selected economies from Africa, Asia, Central and Eastern Europe, Latin America and the Middle East. The structure of the index is based on a modal classification of barriers. For each of the examined economies, modal-, sector- and aggregate restrictiveness indices are estimated. To limit the subjective assignment of relative weights to the different barriers and modes, the study adopts the Factor Analysis methodology<sup>2</sup>.

The OECD regulatory database is currently complete and corresponding indices are under construction. The database and corresponding indices broadly categorize measures affecting trade and investment into: measures affecting entry, measures affecting operations, barriers to competition and transparency measures. The objective of this structure is to cover all aspects related to trade and investment for a more accurate assessment of barriers to trade. The structure of the STRI for telecommunications is summarized in table 1 below. It is worth noting that for telecom services, only commercial establishment and related movement of natural persons is considered in the database and the index.

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<sup>2</sup> According to this methodology, each barrier is assigned a weight according to its contribution to the overall variance of the data. The advantage of factor analysis is that the weighting scheme is driven more by the data than the subjective allocation of weights.

TABLE 1: STRUCTURE AND CONTENT OF THE OECD-STRI FOR TELECOMMUNICATIONS

Category	Examples
Restrictions on foreign ownership and other market entry conditions	Foreign equity restrictions, restrictions on the legal form of the company, restrictions on the number of firms permitted to practice, Board of Directors requirements, minimum capital requirements, screening and approval of investment
Restrictions on the movement of people	Quotas, labor market tests, limitations on the duration of stay
Other discriminatory measures and international standards	Foreign suppliers are treated less favorably regarding taxes and subsidies, foreign participation in public procurement, laws or regulations require the use of international standards
Barriers to competition	Government controls at least one major firm, limitations on foreign equity participation in public firms, public firms are exempt from the application of competition laws, the government can overrule the decision of the regulator, the decision of the regulator can be appealed, regulation of access, interconnection, local loop unbundling, collocation and site sharing, frequency spectrum and secondary spectrum trading, roaming rates, number portability is required, vertical separation is required
Regulatory transparency and administrative requirements	Public availability of licensing agreements, information on spectrum allocation and fees, laws and regulations, availability of one –stop-shop, range of visa processing time, costs and number of procedures necessary to register a company

Source: OECD (2010)

The World Bank project also consists of constructing a Services Trade Restrictions Database (STRD) that contains all information related to trade policy in a comparable manner for a set of 103 countries (79 of which are developing, and 24 are OECD countries, so as to cover different regions and different income levels). The database covers telecommunications, financial, retail, distribution, transport and professional sectors and subsectors where relevant. The objective is to include all domestic policies that act discriminately against foreign service providers, and therefore excludes consumption abroad (mode 2). The database is based on surveys distributed at law offices in developing countries and Economic Intelligence Units reports for the OECD countries. The data has also been verified and confirmed by the government in a number of examined countries. Borchert *et al* (2012a) use the database to construct the STRI based on a modal classification of barriers. The study adopts a simple and uniform scoring scheme composed of five levels of restrictiveness: a completely open regime (value of zero), a completely closed regime (value of 100), virtually open with minor restrictions (25), virtually closed with very limited opportunities to enter (75), and an intermediate degree of openness with average restrictions (50). Relative weights assigned to the different policy

measures are based on expert judgments. As usual, the value of the final index for each subsector/sector is a weighted sum of scores. For telecommunications, the STRI includes only restrictions on commercial establishment and can be divided into general policy measures affecting commercial establishment in all sectors, and sector-specific restrictions. The composition of the World Bank STRI for telecommunications services is described in table 2.

TABLE 2: STRUCTURE AND CONTENT OF THE WORLD BANK STRI FOR TELECOMMUNICATIONS

Category of barriers	Examples
<b><i>General barriers to commercial establishment</i></b>	
Legal form of entry and limitations on foreign equity	Restrictions on the legal form of the entity (branch, subsidiary, joint-venture), restrictions on foreign equity
Licensing limits and transparency of licensing requirements	Limits on the number of licenses issued, discriminatory licensing criteria, license allocation mechanisms
Restrictions on operations	Nationality requirements for the BoD or employees, restrictions on the repatriation of earnings
Relevant aspects of the regulatory environment	Existence of a separate regulatory body, independence of the regulator from the government, prior notice of regulatory changes, right to appeal the decisions of the regulator
<b><i>Telecom-specific barriers that affect commercial establishment</i></b>	
Additional restrictions on operations	Restrictions on the ownership and operation of international gateways, restrictions on the provision of Voice over Internet (VoIP) services, application of the technology-neutral approach while granting licenses
Additional aspects of the regulatory environment	Independence of the regulator from the operators, public availability of previous interconnection agreements and spectrum allocation

Source: Borchert et al (2012b)

One of the major shortcomings of this index is that it does not include non-discriminatory policies that may act as important barriers to trade, and that include potential discrimination against foreign providers. The exclusion of such barriers may undermine the estimated values of the restrictiveness index. Further analysis of the World Bank methodology is provided in subsequent sections, where the results of this paper are compared to those by the World Bank concerning the telecom sector in Egypt.

Last, it is important to mention two case studies that serve as a reference for the index developed in this paper and that are important for comparison purposes: the first is a study on the Egyptian telecom sector by Kheir El Din et al (2005) as part of a larger FEMISE project to assess the barriers to trade in banking, telecommunications and maritime transport services for a

number of MENA countries. The restrictiveness index is computed for fixed, mobile and internet services in Egypt and includes the following trade policy measures:

- *Restrictions on commercial establishment*: such as restrictions on licensing, restrictions on the form of commercial presence, restrictions on foreign equity participation, restrictions on the Board of Directors, restrictions on the provision of certain types of services;
- *Restrictions on the movement of natural persons*: such as restrictions on the permanent movement of people and restrictions on the temporary entry of executives and specialists;
- *Other restrictions*: this category includes aspects of domestic regulation, such as regulatory autonomy, pricing, and regulation of interconnection.

The second study is that by Marouani and Munro (2009), where the modal structure and components of the restrictiveness index developed previously by Dihel and Shepherd (2007) are applied to financial, telecommunication and transport services in Egypt, Lebanon, Jordan and Morocco. The data is based on questionnaires and reports prepared by local consultants, in addition to GATS schedules of specific commitments and an overview of national legislations.

Before moving to the methodology and the results obtained in this paper, it is important to briefly overview the telecommunications regulatory framework and markets for fixed, mobile and internet services in Egypt.

### **3. The telecommunications sector in Egypt**

Since the late nineties, the telecommunications sector has been witnessing major developments: after the poor performance and an inefficient pricing structure practiced by the domestic government-owned operator ARENTO<sup>3</sup>, landline infrastructure has been upgraded and modernized with the creation of Telecom Egypt (TE), a partially privatized joint-stock company, and the establishment of a separate regulator in 1998. Significant regulatory reform has been achieved with the creation of the independent National Telecommunications Regulatory Authority in 2003. Under the supervision of the Ministry for Communications and Information

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<sup>3</sup> Arab Republic of Egypt National Telecommunication Organization, established in 1982 as the sole provider and regulator of communications in Egypt. Law 19/1998 separated regulation and provision by transforming ARENTO into Telecom Egypt, and by assigning regulation to the Telecom Regulatory Authority (TRA) that became the National Telecom Regulatory Authority with enhanced independence with the issuing of Law 10/2003, also known as the Telecom Act.

Technology (MCIT) created in 1999, the sector has also been opened to new services (such as mobile communications and internet) and to new domestic and foreign investment, especially with the signature of the Basic Telecommunication Agreement (BTA) in 2002 and the commitment to fully liberalize the telecom markets by January 1<sup>st</sup>, 2006.

Despite the significant achievements and developments that mark the telecom sector in Egypt, the current regulatory framework set out by the main Telecom Act and complementary laws, presidential decrees and executive regulations, reveals a number of shortcomings that mainly arise from the lack of full regulatory autonomy. Although the NTRA is an officially independent authority, it remains subordinate to the government, being headed by the Minister of Communications, and its Board of Directors being nominated by the Prime Minister. Another problem arises from the lack of full financial autonomy of the NTRA. Referring to Article 8 of Law 10/2003, the NTRA's sources of funding are diverse, and include funds allocated from the general budget of the State as well as funds allocated by the Cabinet of Ministers upon request by the Minister for Communications, which increases the risk of political interference and regulatory capture (Helmy, 2009). Another problem arises from the political leverage of TE, the fixed incumbent and monopoly of landline telephony so far. With the government owning 80% of the company, and the continuous dependence of the regulator from the Ministry of Communications, it is difficult to ensure actual independence and neutrality of the regulatory body. The regulation of the sector also suffers from some deficiencies affecting competition: although cross-subsidization and under-pricing of services are prohibited, exemptions are allowed in the absence of any criteria or time frames. Also, pricing of different services is not subject to any clear pricing rules.

The three telecom subsectors reveal different market structures and different degrees of competition. Although the market for landline services is officially liberalized since January 1<sup>st</sup>, 2006, it remains a monopoly of TE, a joint-stock company with a private share of stocks of 20%<sup>4</sup>. The persisting monopoly could be explained by poor market conditions and the absence of interested bidders, but also by the overprotection of TE for a number of social and political reasons. The modernization undertaken by TE has resulted in a jump in the number of landlines, reaching a maximum of 11.86 millions and a corresponding penetration rate of 15.7% (MCIT,

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<sup>4</sup> Law 19/1998 allows for private sector participation of a maximum of 49%, while the State must remain at least 51% of the shares of TE.

2010). TE has also undertaken a significant price restructure since 1998, including a gradual reduction of tariffs for international and local long distance calls and an increase in tariffs for local short distance calls, implementing herewith Egypt's GATS commitments that imply the cancellation of cross-subsidization of local calls that ARENTO had been practicing at the expenses of international telephony. Despite the significant improvement, the performance of TE has been declining since 2009. Not only has it failed to attract new customers, but it has also started losing subscribed customers. This could be explained by TE's new pricing strategy that included an increase in tariffs for domestic calls, installation fees and monthly subscription fees, by the rapid expansion of mobile communications, replacing hereby landlines, or, finally, by the limited capacity of TE to expand its infrastructure throughout Egypt to reach remote areas and new suburbs. The new pricing strategy had already resulted into a drop in TE's revenues from 8.5 million EGP in 2005 to 4.3 million EGP in 2006 (Ghoneim, 2008). To compensate eventual revenue drops, TE is diversifying its activities: it has agreed with two mobile service providers to channel their calls through its network on a revenue sharing basis, it bought 44.95% of the total shares of Vodafone Egypt, and it has created TE Data, one of the largest Internet Service Providers in Egypt.

Mobile services were introduced in 1996, but were expanded with the licensing of two private operators, Mobinil and Vodafone, in 1998. According to Egypt's GATS commitments, these were granted an exclusivity period that ends in 2002 to recover their fixed costs. The third operator, Etisalat Misr, entered the market only in May 2007. The market has currently over 90 million mobile subscribers, with a penetration rate of over 112% (MCIT, 2012). The quality of the service has improved significantly with the intense and increasing competition. Similar to the case of landline services, there are no specified pricing formulas stated by law or by any executive regulation. Official documents state that telecom-service providers are committed to report tariffs and any future changes in applied tariffs to the NTRA and seek its approval (Law 10/2003, Article 25)<sup>5</sup>. Interconnection negotiations and agreements are left to negotiations between the operators, while the role of the NTRA is limited to dispute settlement. Between 1998 and 2007, tariffs for mobile communications have witnessed significant reductions as a

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<sup>5</sup> Ghoneim (2008) suggests that pricing of mobile services rather tends towards a price-cap formula, but that the degree of consultation between the NTRA and the operators ensures that these are *de facto* engaged in this process, which confirms the lack of a specific pricing formula adopted by the NTRA.

result of the competition between Mobinil and Vodafone to gain market shares. With the entry of the third mobile operator, tariffs for domestic calls have experienced an average reduction of more than 50% from 1.2 EGP<sup>6</sup> to 0.57<sup>7</sup> EGP between 2008 and 2012. Creative mobile-services packages and a variety of subscription systems were introduced to suit all categories of customers with different interests. In 2012, a fourth license has been granted to Telecom Egypt to operate as a Mobile Virtual Network Operator (MVNO), where it will buy voice and data services in bulk at a discount from other local mobile firms and resell them to the customer. Benefits from such increased competition remain – however- questionable, given the size and the saturation of the market. Additionally, further competition in basic tariffs could jeopardize the quality of the service. There are also worries related to potential anti-competitive behavior of TE<sup>8</sup>. Benefits from increased competition could eventually arise from innovation and high technology value-added services. Given that the 90% of the customers use prepaid cards (and are mainly interested in basic services), the expansion of high-end services remains limited.

The market for internet services is the most competitive telecom market in Egypt with a larger number of internet service providers (ISPs). Commercial internet services were first introduced to the Egyptian market in 1996 and expanded rapidly. Licensing conditions are perceived to be less complicated and less costly than licensing of mobile operators. Three types of licenses that are assigned to ISPs: License A allows for all kinds of establishment, operation and resale of infrastructure, license B enables its holders to establish and operate, but not to resell bandwidth to other operators, and license C is a “virtual” license allowing its holders to lease and offer value-added services only. There are currently 7 class -A licensees, 4 class-B licensees, and 154 class-C licensees (ITU, 2012). The internet market has witnessed a significant expansion since the MCIT’s “Free Internet Initiative” in 2002, where monthly subscription fees (of 100 EGP) for narrowband services were cancelled and customers had to pay a per-hour tariff equivalent to the regular tariff of an outgoing local call (1 EGP). ISPs were compensated on a revenue-sharing basis with TE. As for broadband internet, the MCIT had also carried out a series of significant price reductions, which promoted the service but resulted into losses and exit of

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<sup>6</sup> Egyptian Pound

<sup>7</sup> Tariffs for a 3-minute local call for prepaid services

<sup>8</sup> TE is the monopoly of landline services and of the fixed infrastructure in Egypt. It also holds 45% of the shares of Vodafone and has now acquired the mobile license. Barma (2012) argues that the government tender process may be tailored for TE’s benefit.

several providers. These initiatives have resulted into a significant drop of broadband subscriptions fees from 250 EGP to 45 EGP<sup>9</sup> per month, and the increase of internet penetration from less than 1% in 1999 to over 38% in 2012 (MCIT, 2012).

#### **4. The STRI for telecommunications services in Egypt: Methodology**

This paper presents a different structure and provides new components of the STRI for telecom services in Egypt. Although previous studies on Egypt (Kheir El Din *et al* (2005) and Marouani and Munro (2009) serve as basic references to the construction of the index, a number of additional components are derived from the ongoing OECD project. The scoring system is also enhanced and adjusted to provide more accurate results.

The objective of this index is to capture all types of barriers affecting trade of telecommunications. Since this sector relies heavily on investment, the index will only take into account barriers affecting commercial establishment and related movement of natural persons (for example restrictions on the Board of Directors and movement of sector experts).

The STRI developed in this paper is based on three main sub-categories of barriers that allow covering a larger spectrum of information and various types of potential impediments to trade and investment. In addition to traditional barriers to trade (mostly barriers to entry) listed in GATS schedules of specific commitments, two more categories of impediments are included: the first category includes all types of regulatory aspects that could give rise to impediments to competition and efficient provision of telecommunications services, and the second category provides information about transparency issues related to the regulator and to investment procedures and administrative requirements. The general structure of the STRI is provided by table 3 below. Details on the definition of the different components of the STRI and the weighing and scoring schemes are provided in the annex of this paper.

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<sup>9</sup> Three main price reductions have taken place: from 250 EGP to 150 EGP in 2003, from 150 EGP to 95EGP in 2006, and finally to 45 in 2007. The last reduction is conditioned by limited download capacity or limited number of connection hours of the user (a speed of 256 kbps, with a download capacity of 2 Giga bits per second per month or a limited number of connection hours). Subscriptions for higher speeds were left to the ISPs to determine their prices and the corresponding download capacity or number of hours. Services with a 2 Giga bits per second speed and unlimited download capacity has been priced by the government at 760 EGP monthly and targets mainly businesses and other organizations.

TABLE 3: BASIC STRI STRUCTURE

Aggregate STRI	Content	Examples
<b>Trade Restrictiveness Index</b>	Restrictions on commercial presence	<ul style="list-style-type: none"> <li>- capital requirements</li> <li>- licensing</li> <li>- restrictions on the legal form of the company</li> </ul>
	Restrictions on movement of natural persons	<ul style="list-style-type: none"> <li>- limitations on the duration of stay</li> <li>- quotas on foreign employees</li> <li>- BoD requirements</li> </ul>
<b>Regulatory Restrictiveness Index</b>	Regulation and pricing of services	<ul style="list-style-type: none"> <li>- regulation and pricing of access, interconnection, frequency spectrum</li> <li>- right to appeal the regulator's decisions</li> </ul>
<b>Transparency Index</b>	Sector-specific transparency	<ul style="list-style-type: none"> <li>- availability of licensing and interconnection agreements</li> </ul>
	General and administrative transparency	<ul style="list-style-type: none"> <li>- Public availability of regulations prior entry into force</li> <li>- availability of a one-stop-shop for investment procedures and administrative requirements</li> </ul>

While the first group of barriers can be perceived as barriers to entry mostly applied to discriminate against foreign providers of the service, regulatory barriers are mainly barriers to competition that affect the cost of operations of the provider, and are generally non-discriminative barriers. However, these barriers should be included in the estimation of the index since they include a potential for discrimination. In other words, these barriers are likely to be used to discriminate between domestic and foreign suppliers. Also, these barriers include equally important and significant trade-costs as barriers to entry: trade may be liberalized under official GATS commitments, but benefits from liberalization may be offset by the existence of restrictive regulations. Finally, transparency issues and related impediments are of particular importance to efficient investment in telecommunications, especially in developing countries where the lack of transparency negatively affects the incentives to invest and increases the cost of trade.

The current methodology presents a number of contributions as compared to previous literature on Egypt: First of all, the index covers a larger scope of measures that may act as impediments to trade in telecommunications. In addition to barriers to trade usually listed under

GATS commitments, the index includes behind-the-border measures and regulations that actually impede domestic, but also foreign investment or increases its cost. The index is completed by additional measures that represent impediments to transparency and that also affect the decision and cost of investment. Data used in this paper have been collected through direct use and deep analysis of official documents that extend beyond GATS commitments to include all national legislations related to investment and labor in Egypt, such as the Corporate Law, the Labor Law, and the Investment Incentives and Guarantees Law. Information on prerequisites, procedures, and costs of commercial establishment are extracted from a number of publications and investors' explanatory guides provided by the General Authority for Investment (GAFI) in Egypt. Sector-specific laws are also an indispensable source of information on potential regulatory barriers to trade in telecommunications services. In this context, the Telecom Egypt Law, the Telecom Act and related decrees are basic references to evaluate the regulatory environment. To provide a more accurate picture, official documents need to be compared to the actual situation prevailing in the sector. Information was verified and completed through reports of the NTRA and the MCIT, and –finally- through communication with Mr. Maged Othman, the former Minister of Communication and Information Technology.

Another contribution of this work is that it takes in consideration the *de facto*, not the *de jure* situation while assigning scores to reflect the real degree of restrictiveness, and to yield more accurate STRI results. One of the limitations of previous research (especially research that includes a large set of countries), is that more weight is attributed to official documents, rather than the actual situation. Sometimes, official GATS commitments remain unimplemented, or offset by the presence of burdensome and restrictive behind-the-border policies. The actual provision of services in general and telecommunications in particular, is rather determined by internal sector-specific regulations, and general regulations related to taxes, labor and investment. Actual implementation of GATS commitments is therefore subject to modifications of internal regulations to be in line with trade commitments. In this context, it is important to point out a major difference between the STRI developed in this paper and that by the World Bank<sup>10</sup> that may affect the scores and the interpretation of the results. Although the WB database is very information-intensive, it is mainly based on official documents, and -as explained by

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<sup>10</sup>Results are published in World Bank (2012)

Borchert *et al* (2012b) - does not provide information about the actual implementation of policies or commitments. In this paper, the author tried to avoid these ambiguities by verifying the implementation of the commitments and regulations to provide a more accurate evaluation of the real level of restrictiveness prevailing in Egypt, and to adjust the scores accordingly.

## **5. Findings**

The STRI developed in this paper is composed of three sub-indices: a Trade Restrictiveness Index (TRI) that includes all barriers related to entry, the Regulatory Restrictiveness Index (RRI) that includes all barriers arising from regulatory inefficiencies affecting competition, and the Transparency Index (TI) which covers aspects of transparency that affect the decision to invest and increases costs. This section provides a discussion of each of these indices separately, and concludes with a discussion of the results for the aggregate STRI, which is a weighted average of the three sub-indices.

The computation of the first component, the TRI, for fixed, mobile and internet sectors in Egypt suggests that the market for landline telephony is the most restrictive, with an index value of 0.65, whereas mobile and internet markets show less restrictive results (0.39 and 0.19 respectively). Table 4 provides details on the scores assigned to the different barriers and the total value of the TRI for the 3 subsectors.

TABLE 4: TRI RESULTS

Measure	Fixed	Mobile	Internet
	<b>Barriers to commercial establishment</b>		
Foreign equity limits	0.51	0	0
Obligation to enter through joint venture	0	0	0
Other restrictions	1	1	1
Market structure	1	0.5	0
Licensing	1	0.75	0.25
	<b>Restrictions on the movement of natural persons</b>		
BoD requirements	0.9	0	0
Movement of people-short stay	0	0	0
Movement of people-long stay	0	0	0
Movement of people-quotas	0.75	0.75	0.75
<b>TRI = sum of weighted scores</b>	<b>0.68</b>	<b>0.39</b>	<b>0.19</b>

Barriers to commercial establishment of landline services are higher than those in mobile and internet markets. Despite the official removal of all barriers to entry since January 1st, 2006 (as per Egypt's GATS commitments), TE remains the sole provider of landline services. Given that licenses are an important source of revenue for the government, a second license has been postponed several times due to the overall economic slowdown and the lack of interested bidders. The company is also considered as an important source of revenue due to its diversified activities and is perceived to be operating at a “satisfying” level in terms of quality and tariffs<sup>11</sup>. TE’s monopoly of landline services may be therefore protected by the NTRA and the MCIT. Since the entry of a second competitor is unlikely to happen (at least in the short term), the level of restrictiveness for licenses has been raised to 1 and the market is considered a monopoly (receiving a score of 1), indicating that no licenses will be granted, even if this is not an official announcement. The study by the World Bank (2012) assigns a score of 0 to licensing. Based on

<sup>11</sup> The tariff of a local call is 0.03 EGP or 0.005 USD and is considered low by domestic and international standards. Government officials argue that the introduction of one or more competitors is less likely to decrease tariffs and improve competition.

official documents, there are no restrictions on the number of licenses. However, it is necessary to adjust the score to reflect the actual situation, which explains differences in scores assigned in both, the World Bank-, and the present study.

Commercial establishment in the mobile market appears to be less restricted, with a more competitive market composed of three operators, and with the absence of restrictions on the share of foreign equity and the form of the company. The market is also expected to become more competitive with the assignment of a fourth license. Licensing and approval procedures are –however- complicated: licensing is a decision of the NTRA, but there are no specific criteria, which could include potential discrimination. Licenses are a main source of revenue for the ministry and are therefore expected to be costly<sup>12</sup>. Law 10/2003 only states that the NTRA's BoD has the right to determine the cost of the licenses and the methods of collection of the fees. A score of 0.75 has been therefore assigned to indicate a relatively restrictive and potentially discriminative licensing policy.

The market for internet services reveals the highest degree of openness and competition, with no restrictions on the share of foreign capital or type of the company. Licensing is based on application fees and a less complicated number of procedures. This is why a score of 0.25 is assigned to licensing procedures. An additional restriction exists –however- for investments in the three subsectors: according to the Egyptian corporate law, all companies must be registered in Egypt (as Egyptian companies). Therefore, a score of 1 is assigned to this variable for fixed, mobile and internet services.

There are no restrictions on the duration of stay whether for short or for longer periods. The main restriction is related to the quota imposed on foreign labor. As per Egypt's GATS horizontal commitments and Labor Law, the quota imposed on foreign employees is 10% of the total number of employees in a productive unit. However, Article 30 of the Labor Law allows for exceptions to be decided by the Minister of Labor. Therefore, the score is decreased from 1 to 0.75 to reflect the flexibility of the quota.

There are also no restrictions on the share of foreign members in the BoD in mobile and internet services, since these are covered by the Investment Law which allows for this exception.

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<sup>12</sup> Etisalat has acquired the license for 16.7 billion EGP

A potential competitor in landline services might not be subject to BoD requirements. Nevertheless, the current status of TE as a government-owned company implies that the maximum number of foreigners in the BoD should not exceed 10%.

The second component of the STRI is the regulatory index (RRI) that covers all barriers of regulatory nature that may hinder competition in the three markets. These include the right of firms to appeal the decision of the regulator, in addition to regulations of interconnection, access and pricing of final services. Table 5 shows the results for the RRI and the detailed scores assigned to the different barriers.

TABLE 5: RRI RESULTS

Measure	Fixed	Mobile	Internet
Right to appeal decisions of the regulator	0.5	0.5	0.5
Access to local network is mandated	1	1	1
Access prices are regulated	0.5	0.5	0.5
Interconnection is mandated	1	1	N/A
Interconnection prices are regulated	0.5	0.5	N/A
Local loop unbundling is mandated	1	N/A	1
Local loop unbundling prices are regulated	0.5	N/A	0.5
Spectrum allocation is regulated	N/A	1	N/A
Secondary spectrum trading is allowed	N/A	0.5	N/A
End-user tariff is regulated	0.75	0.25	0.5
<b>RRI = sum of weighted scores</b>	<b>0.72</b>	<b>0.66</b>	<b>0.64</b>

The results of the TRI suggest that landline services remain closed to competition as compared to mobile and internet markets. However, the differences between the scores are smaller than in the case of the TRI. This is because regulatory inefficiencies affect the three telecom markets in a similar way. For example, a common barrier to competition in the three subsectors is the inability to appeal the decisions of the regulator to an independent authority to which the regulator holds account. The decisions of the regulator can only be reversed by Court

decisions. Given the duration of ruling decisions in Egypt, and possible bias against foreign service providers, the score has been set at 0.5.

Another indicator of regulatory deficiency is the lack of mandatory power of the regulator. The use of the basic network infrastructure is not mandated by law. According to Article 33 of Law 10/2003 "The Telecommunications Network Licensee shall *have the right* to enter into agreements with other licensees to use his network paths in return of an agreed and reasonable price." This applies to use of the network as well local loop connecting to the customers' premises. The obligation for telecommunications licensees to provide access to their networks has been mentioned by an additional regulation setting the general framework for competition and anti-monopoly behavior ("the licensee shall abide by providing access to his network [...] at reasonable prices based on the real cost, (NTRA, 2012)). However, neither Law 10/2003 nor the additional anti-trust regulations provide any details about eventual penalties of violation of this condition. Although access is officially mandated by this clause, the mandatory power of the regulator is offset by the lack of an enforcement measure or penalty. Therefore, a score of 1 has been assigned to mandatory access and local loop unbundling in the three subsectors, reflecting the highest degree of regulatory inefficiency. The same score applies to interconnection, where Article 28 of Law 10/2003 states that licensees shall abide by the conclusion of interconnection agreements at reasonable terms and submit the agreements to the NTRA for approval. Ministerial Decree no.165/2003<sup>13</sup> sets a general framework for the legal, technical and financial information to be included in interconnection agreements. However, a clear obligation or enforcement measure is completely absent.

As for pricing of access, local loop unbundling and interconnection, the NTRA only interferes upon request of one of the parties for dispute resolution. Therefore, a score of 0.5 has been assigned to these three measures, reflecting the role of the NTRA in setting prices only in the case of disputes. It is worth noting that the Kheir El Din *et al* (2005) adopt a different approach to evaluate the regulation and pricing of interconnection, where they perceive the intervention of the NTRA in such agreements as restrictive, and apply therefore an inverse scoring scheme. The logic of the present work is – however- different. To enhance competition and limit anti-competitive behavior (especially in agreements including TE, monopoly of the

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<sup>13</sup> The Decree is not available, source of information is from the NTRA website: [http://www.ntra.gov.eg/arabic/dpages\\_dpagedetails.asp?ID=230&Menu=1](http://www.ntra.gov.eg/arabic/dpages_dpagedetails.asp?ID=230&Menu=1)

infrastructure), interconnection should be mandated and regulated, and a clear pricing formula for interconnection should be determined by the regulator.

Regulation of spectrum for mobile services reveals a potential for discrimination. According to Article 49 and 53 of Law 10/2003, the NTRA allocates frequencies and determines the fees for spectrum usage. Article 54 of the same law enables the NTRA to reallocate frequency bands and compensate the affected service provider. The allocation of frequency spectrum is perceived by Kheir El Din *et al* (2005) as discriminative and costly, and receives a score of 1. Secondary spectrum trading is subject to approval by the NTRA (Article 57 of the same law). Secondary spectrum trading receives an intermediate score of 0.5 to reflect the condition of prior approval by the NTRA.

A final aspect of regulatory inefficiency is regulation of end-user tariffs. Tariffs are determined by the service provider and are subject to approval by regulator. In the case of landline services, the market is a monopoly and therefore a clear pricing formula should be adopted. Moreover, the Telecom Act allows for temporary under-pricing of specific services, a condition that is very frequently used by TE. The score has therefore been set at 0.75 to reflect a possible bias of the NTRA towards Telecom Egypt. Contrary to Kheir El Din *et al* (2005), the scoring scheme adopted in this paper considers the lack of a specific pricing formula for monopoly as the most restrictive measure.

In the case of mobile services, pricing of end-user tariffs are only subject to approval by the NTRA, which is necessary, given the relatively competitive mobile market. At the same time, the approval of the NTRA is not specified by any conditions and includes potential for discrimination. Therefore, a score of 0.25 has been set to this measure to reflect the possibility for the NTRA to discriminate against service providers.

Pricing of internet services receives a higher score of 0.5, since the NTRA has pre-set tariffs for basic internet services, while other broadband services with higher speed and download capacity have been left to market forces. The internet market being competitive, the regulation of the service is a barrier to competition and, as explained previously, has forced a number of ISPs to exit the market.

The third component of the STRI is the transparency index (TI). This index includes measures that improve transparency of the regulator and, generally, encourage potential investments. Table 6 shows the results for the transparency index for fixed, mobile and internet services.

TABLE 6: TI RESULTS

Measure	Fixed	Mobile	Internet
Information on licensing agreements are publicly available	0	0	0
Information on access/interconnection agreements are publicly available	0.75	0.75	0.75
Information on spectrum allocation are publicly available	N/A	0	N/A
Regulations are available prior entry into force	0.75	0.75	0.75
There is a one-stop shop for all procedures of licensing and investment	0	0	0
<b>TI= sum of weighted scores</b>	<b>0.375</b>	<b>0.3</b>	<b>0.375</b>

The results for the TI are 0.375 for landline and internet services and 0.3 for mobile services. The slight difference between the values for mobile services on one hand, and internet and landline services on the other hand, originates from the higher number of variables included in the mobile transparency index, and the lower weights assigned to each of these.

The regulator in Egypt has been working on increasing transparency in sector-specific issues, such as the availability of information concerning licensing of the different services and spectrum allocation. Interconnection agreements are unavailable to the public but may be consulted upon written request to the NTRA, which includes the possibility for refusal to provide access to interconnection agreements, and therefore a score of 0.75 has been assigned to this measure.

Another measure of transparency is the availability of regulations (or drafts) prior to entry into force, which provides the necessary information for existing and potential investors, and enables the participation of service providers in the decision-making process. There is no formal procedure through which regulations or drafts are published neither on the domestic, nor on the international level. The NTRA has recently adopted partial measures of transparency by publishing news briefs and press releases about regulatory and sector-specific issues on its

website. However, no details are available and there is no formal obligation to provide such information. Therefore, a value of 0.75 has been assigned to this measure.

Finally, an important achievement is the investor's "one-stop-shop" implemented by the Ministry of Investment and the General Authority for Investment in Egypt as part of a general strategy to reduce barriers and facilitate procedures of investment, by providing a complete guide to domestic as well as foreign investors. The measure receives therefore a score of 0.

The aggregate STRI for fixed, mobile and telecommunications services is a weighted average of the three indices (TRI, RRI, TI), where each sub-index receives a relative weight corresponding to its content in terms of number of policy measures. This weighing scheme is arbitrary. However, the assignment of relative weights to the different barriers is mostly based on a subjective assessment of the potential impact of these barriers. For a large number of observations (countries), improved statistical methods could be applied. Table 7 shows the results for the STRI in the three subsectors:

TABLE 7: AGGREGATE STRI RESULTS

<b>Subsector</b>	<b>Fixed</b>	<b>Mobile</b>	<b>Internet</b>
<b>STRI</b>	0.64	0.46	0.40

A general conclusion is that the results go in line with previous studies on the telecommunications sector in Egypt, where landline services are the most closed markets, followed by mobile and internet markets. A comparison of the final results of the STRI with those of the previous studies is, however, less useful. Marouani and Munro (2009) construct a modal STRI, covering herewith impediments to the four modes of supply of telecommunications services. The comparison of the final results is therefore not feasible, given the different objective and scope of coverage of this study.

As for Kheir El din et al (2005) and the World Bank (2012), these studies reveal a number of similarities to the present paper, in terms of the objective of the studies and the measures that are included in the index: both studies measure barriers to commercial establishment and related movement of people for telecommunications services. Yet, the present STRI includes additional measures of regulatory and transparency nature, which may explain

differences in the final results. The larger number of measures covered by this paper implies differences in the assignment of relative weights, which may also explain differences in the final scores. Finally, some measures are scored differently by these two studies. As explained previously, pricing of end-user tariffs is perceived and scored differently than in Kheir El Din *et al* (2005). Scores for other barriers to market entry are also adjusted to reflect the real situation, whereas the scores in the World Bank (2012) are mainly based on the official GATS commitments and national legislations.

## **6. Conclusion**

The main objective of this chapter is to develop a Services Trade Restrictiveness Index (STRI) for telecommunications services in Egypt. One of the contributions of this work is the variety of sources that are consulted to cover all potential measures affecting trade and investment in telecom services in Egypt.

Another contribution is the coverage of additional policy measures and transparency issues derived from the OECD database and their application to the case of Egypt. To the knowledge of the author, some of these measures have not been covered by any of previous studies on Egypt.

A final contribution is the adjustment of the scores assigned to the different policy measures so as to provide more accurate results reflecting the actual rather than the official state of liberalization and competition in the telecom sector.

The results highlight the existing gap between Egypt's official GATS commitments and the actual state of competition in the telecom market, especially for landline services. This conclusion goes in line with the current market structure and with evidence on the overprotection of TE. Mobile and internet markets are more competitive, but still suffer from restrictions related to inefficient regulation. In this context, a major problem is the lack of mandatory power of the regulator, especially in the regulation of bottleneck resources controlled by the domestic incumbent. Such barriers to competition are raised by the relative lack of transparency concerning sector-specific issues and regulations, and the lack of participation of services providers in the decision-making process. Enhancing the independence of the regulator, setting more consistent and pro-competitive regulatory policies and, finally, enforcing a transparent

framework, are indispensable for increasing the performance of the sector and fulfilling Egypt's international commitments.

Quantification of barriers to trade in services gives rise to several difficulties. However, the most important limitation is related to subjectivity. The transformation of qualitative information into some quantitative measure involves a lot of subjectivity. First of all, the evaluation of the degree of restrictiveness of a given policy measure is often based on a subjective assessment. Second, the assignment of weights to the different measures is also based on the subjective assessment of their impact on trade or provision. The present STRI is therefore limited by the same difficulties, which are mainly related to weighing and scoring of the different barriers of trade in services, especially those included for the first time. The expected results of the OECD project could therefore serve as a reference for improving the weighing system and benchmarking policy measures, and for the inclusion of additional policy measures. In addition to possible enhancements of the methodology, the scope of the study could be extended to a larger number of countries, where more accurate statistical methods, such as the Factor Analysis, could be used to limit subjectivity.

## References

- Barma, M. (2012), Mobile Market Prepares for a New Player, *American Chamber of Commerce in Egypt Business Monthly Magazine*, July, available at: [http://www.amcham.org.eg/resources\\_publications/publications/business\\_monthly/issue.asp?sec=4&subsec=TELECOMS&im=7&iy=2012](http://www.amcham.org.eg/resources_publications/publications/business_monthly/issue.asp?sec=4&subsec=TELECOMS&im=7&iy=2012)
- Borchert, I., B. Gootiiz, A. Mattoo (2012a), Guide to the Services Trade Restrictions Database, *World Bank Policy Research Working Paper no. 610*, World Bank
- Borchert, I., B. Gootiiz, A. Mattoo (2012b), Policy Barriers to International Trade in Services: Evidence from a New Database, *World Bank Policy Research Working Paper no. 6109*, The World Bank
- Boylaud, O. and G. Nicoletti (2001), Regulation, Market Structure and Performance in Telecommunications, *OECD Economic Studies no.32,2001/I*, OECD
- Dee, P. (2003), Services Trade Liberalisation in South East European Countries, *paper presented at the Forum on Trade in Services in South Eastern Europe*, Bucharest, June 24-25<sup>th</sup>
- Dihel, N. and B. Kalinova (2004), Services Barriers and their Economic Impact: Examples of Banking and Telecommunications Services in Selected Transition Economies, *OECD Trade Policy Working Paper no.7*
- Dihel, N. and B. Shepherd (2007), Modal Estimates of Service Barriers, *OECD Trade Policy Working Paper no.51*
- Ghoneim, A.F. (2008), Study on Egypt's Telecommunication Sector, *mimeo*, OECD
- Hardin, A. and L. Holmes (1997), Services Trade and Foreign Direct Investment, *Staff Research Paper, Industry Commission*, Australian Government Publishing Services, Canberra

- Helmy, O. (2009), ICT Services without Borders: an Opportunity for Egypt?, *ECES Working Paper no.150*, Egyptian Center for Economic Studies
  
- Hoekman, B. (1995), Assessing the General Agreement on Trade in Services, in Martin, W. and L.A. Winters (eds.), *The Uruguay Round and the Developing Economies*, *World Bank Discussion Paper no.307*, p.327-364
  
- Holmes, L. and A. Hardin (2000), Assessing Barriers to Services Sector Investment, in Findlay C. and T. Warren, *Impediments to Trade in Services: Measurement and Policy Implications*, Routledge, p. 60-78
  
- ITU (2012), ICT Adoption and Prospects in the Arab Region, *Connect Arab Summit 2012*, International Telecommunications Union, Geneva
  
- Kheir-El-Din, H., A.F. Ghoneim, H. Sakr (2005), Telecommunications Sector in Egypt, in Achy, L., M. Boughzala, Kheir-El-Din, H., S. Togan (eds.), *Impact of Liberalization of Trade in Services: Banking Telecommunications and Maritime Transport in Egypt, Morocco, Tunisia and Turkey*, Research no.FEM 22-02, FEMISE Research Programme, Centre for International Economics, Bilkent University, Turkey, p.151-184
  
- Koyama, T. and S. Golub (2006), OECD's FDI Regulatory Restrictiveness Index: Revision and Extension to More Economies, *OECD Working Paper on International Investment no.2006/4*
  
- Marko, M. (1998), An Evaluation of the Basic Telecommunications Services Agreement, *CIES Policy Discussion Paper no.98/09*, Centre for International Economic Studies, University of Adelaide
  
- Marouani, M.A. and L. Munro (2009), Assessing Barriers to Trade in Services in the MENA Region, *OECD Trade Policy Working Paper no.84*

- MCIT (2012), ICT Indicators Report : 2007-2011, Ministry of Communications and Information Technology
- MCIT (2010), ICT Indicators in Brief, November 2010 Monthly Issue, Ministry of Communications and Information Technology
- OECD (2011), Services Trade Restrictiveness Index, Opening the Way for Services Trade Liberalization, available at: <http://www.oecd.org/trade/servicestrade/47342418.pdf>
- OECD (2010), STRI: A Guide to the Regulatory Database: Measures, Explanatory Notes and Examples, *Working Paper no. 20107*, Trade Committee, Trade and Agriculture Directorate
- Warren, T. (2000), The Identification of Impediments to Trade and Investment in Telecommunication services, in Findlay C. and T. Warren (eds.), *Impediments to Trade in Services: Measurement and Policy Implications*, Routledge, p.79-92
- World Bank (2012), Services Trade Restrictions Index: Egypt Telecommunications, *Services Trade Restrictions Database*, available at: <http://iresearch.worldbank.org/servicestrade/default.htm>

### *Laws and Decrees*

- Corporate Law: Law no. 159/1981, Arab Republic of Egypt, available at: <http://www.investment.gov.eg/ar/Investment/law1591981/law159-1981.pdf>
- Investment Incentives and Guarantees Law no. 8/1997, Arab Republic of Egypt, available at: <https://www.ntra.gov.eg/uploads/law/Investment.pdf>
- Telecom Egypt Law no.19/1998, *Official Gazette no.13/1998*, Arab Republic of Egypt
- Presidential Decree no.10/1998, Arab Republic of Egypt, available at: [http://www.tra.gov.eg/arabic/dpages\\_dpagedetails.asp?ID=180&Menu=5](http://www.tra.gov.eg/arabic/dpages_dpagedetails.asp?ID=180&Menu=5)
- Telecommunication Regulation Law no. 10/2003, Arab Republic of Egypt, available at: [http://www.tra.gov.eg/uploads/law/law\\_en.pdf](http://www.tra.gov.eg/uploads/law/law_en.pdf)
- Labor Law no.12/2003, Arab Republic of Egypt, available at: [http://www.manpower.gov.eg/\(S\(buqgapizmrsdnsnj2sjacli5\)\)/WorkLow\\_En.html](http://www.manpower.gov.eg/(S(buqgapizmrsdnsnj2sjacli5))/WorkLow_En.html)
- Ministerial Decree no. 128/2006, *Egyptian Gazette no.154/2006*, Arab Republic of Egypt

## **Annex: Detailed structure of the STRI and weighing and scoring schemes**

### **a/ Trade Restrictiveness Index (TRI)**

The first component of the index includes all restrictions and regulations applying to mode 3 and mode 4 of trade in fixed, mobile, and internet services. These are:

***Restrictions on commercial presence:*** this mode of supply includes the majority of barriers, since the provision of telecommunications services relies heavily on commercial establishment.

Barriers related to this mode include the following:

- ***Capital requirements:*** restrictions on capital requirements may take the form of limitations on foreign equity participation (in terms of a maximum percentage of foreign capital in telecommunications firms);
- ***Restrictions on the legal form of the company:*** investors may be obliged to enter the domestic market only through joint-ventures, or may encounter other barriers related to the legal form of the company (such as the obligation to register the company in the host country);
- ***Market structure and other barriers to entry:*** barriers to entry include the current market structure and restrictions related to licensing.

***Restrictions on the movement of natural persons:*** *Restrictions on the movement of natural persons take the form of restrictions on foreign members of the Board of Directors, restrictions on the duration of stay, and quotas of foreign employees.*

The provision of telecommunications relies heavily on commercial presence and large investments in infrastructure and technology. Therefore, restrictions on commercial presence are expected to have the most restrictive effects on telecommunications services provision. This is reflected in the TRI, where the majority of barriers are related to mode 3 (commercial presence). Therefore, this mode should be given a larger weight than barriers to mode 4. One of the main difficulties related to weighing of the different components of the index is subjectivity. Different weighing may yield different results. To minimize subjectivity, previous studies computing a restrictiveness index have applied the “factor analysis” methodology. However, the use of this methodology requires a number of countries and sectors (or sub-sectors), which is not the case in this work. To limit this problem, the weighing scheme is designed to be as close as possible to

previous studies that included the same type of barriers, such as Marouani and Munro (2009), and Kheir-El-Din *et al* (2005). In both studies, restrictions on commercial presence are assigned the largest weight among the barriers (around 0.63 in the first and 0.77 in the second study). The content of the TRI is – however- not identical to that of the previous studies. In the case of Marouani and Munro (2009), the STRI is modal and covers all four modes of supply. In the case of Kheir El Din *et al* (2005), the index includes barriers that affect investment in telecommunications, which is a mix of barriers derived from GATS commitments, in addition to a number of internal regulations. Therefore, the relative weights assigned in this work only broadly reflect the relative importance of mode 3 over mode 4, but are not identical to weights assigned in previous studies. The weights chosen in this paper are 0.8 for restrictions on commercial establishment and 0.2 for restrictions on the movement of natural persons.

TABLE 8: TRI WEIGHING AND SCORING SCHEMES

Weight	Measure	Scoring scheme
<b>0.8</b>	<b>Barriers to commercial establishment</b>	
0.2	Foreign equity limits	1: foreign equity participation is prohibited 0: no restrictions on foreign equity participation The intermediate scores are calculated as (1-share of foreign equity allowed)
0.1	Obligation to enter through joint venture	1: obligation for foreign companies to enter through joint-ventures 0: no obligation to enter through joint-venture
0.1	Other restrictions (the company must be registered in Egypt)	1: yes 0: no

0.2	Market structure	1: monopoly 0.5: partial competition 0: perfect competition
0.2	Licensing	1: no new licenses are issued 0.75: licenses are issued through complicated and costly procedures 0.5: licenses are issued with an application fee and several requirements 0.25: licenses are issued with application fees 0: licenses are issued only by application
<b>0.2</b>	<b>Restrictions on the movement of natural persons</b>	
0.05	BoD requirements	1: no foreign members in the BoD 0: no restrictions on the share of foreign members in the BoD Intermediate scores are calculated as (1- share of foreigners in the BoD)
0.05	Movement of people-short stay	1: no temporary entry 0.75: entry up to 30 days 0.5: entry up to 60 days 0.25: entry up to 90 days 0: entry up to 120 days
0.05	Movement of people-long stay	1: no entry 0.8: entry up to 1 year 0.4: entry up to 3 years 0: entry up to 5 years or above

0.05	Movement of people-quotas	1: yes 0: no
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### **b/ Regulatory Restrictiveness Index (RRI)**

The second component of the index includes all types of barriers that affect efficient and pro-competitive regulatory policies. As explained before, these are mostly regulatory deficiencies that act as barriers to competition. These are:

- ***Right to appeal the decision of the regulator:*** the regulator's decisions should be appealed to a third-party independent authority in case of disputes taking place between the operators and the regulator;
- ***Regulation of access:*** access to and use of the local network should be mandated and wholesale access prices regulated
- ***Regulation of interconnection:*** interconnection should be mandated and interconnection rates regulated
- ***Regulation of frequency spectrum:*** frequency spectrum should be allocated on a non-discriminatory basis and within reasonable terms, and secondary spectrum trading allowed;
- ***Regulation of local loop unbundling:*** local loop unbundling is the process of making the cable that originates from the local exchange to the customer's premises available to other providers. Local loop unbundling should be mandated and regulated;
- ***Regulation of end-user tariffs:*** end user tariffs should be regulated in monopolistic markets and left to market forces in more competitive markets.

TABLE 9: RRI WEIGHING AND SCORING SCHEMES

Weight		Measure	Scoring scheme
Fixed/mobile	Internet		
0.125	0.16	Right to appeal decisions of the regulator	1: no 0: yes
0.125	0.16	Access to local network is mandated	1: no 0: yes
0.125	0.16	Access prices are regulated	1: no 0.5: regulator interferes for dispute settlement 0: yes
0.125	-	Interconnection is mandated	1: no 0: yes
0.125	-	Interconnection prices are regulated	1: no 0.5: regulator interferes for dispute settlement 0: yes
0.125	0.16	Local loop unbundling is mandated	1: no 0: yes
0.125	0.16	Local loop unbundling prices are regulated	1: no 0.5: regulator interferes for dispute settlement 0: yes
0.125	-	Spectrum allocation is regulated	1: discriminately decided by the regulator 0.25: auction and application fee 0: no

0.125	-	Secondary spectrum trading is allowed	1: no 0: yes
0.125	0.16	End-user tariff is regulated	Fixed: 1: no 0: yes Mobile/Internet: 1: yes 0: no

Regulation of bottleneck resources and adopting correct and adequate pricing policies of the different types of services is indispensable to limit the market power of dominant firms or of monopolies of infrastructure, such as the case of Telecom Egypt. Some of these barriers have been covered by the index developed by Kheir-El-Din *et al* (2005), such as regulation of end-user tariffs and interconnection under barriers to commercial establishment. Since not all of these barriers have been included before, equal weights will be assigned to the component of the RRI.

**c/ Transparency Index (TI)**

Barriers related to transparency can be divided into sector-specific transparency issues that directly affect telecommunications service providers, and general transparency issues related to the overall investment environment and the degree of complexity of administrative procedures. Simplicity of administrative requirements strongly affects the decision of the supplier to enter the market: transparency and availability of all information and procedures related to market entry and operation may strongly affect the investor’s choice of the host country. The lack of transparency of regulation and the complexity of procedures and administrative requirements may also increase the cost of the supplier in the phase of commercial establishment. In addition to administrative transparency, transparency of the decision-making process plays an important role in determining the investor’s choice. Not only information related to commercial establishment is important to foreign investors, but also sector-specific information, such as the availability of previously concluded agreements. These agreements could serve as a reference for

future agreements. In addition to that, the availability of these agreements provides more transparency, confirms the efficiency of the regulator and provides a healthy investment environment within the sector. Transparency- related barriers are therefore divided into the following:

- **Transparency of the sector:** this category includes aspects related to the transparency in designing and implementing regulations, such as public availability of interconnection, licensing, and spectrum allocation agreements;
- **General transparency of administrative procedures:** including the availability of a one-stop-shop for getting information related to investment and all necessary procedures related to commercial establishment, in addition to the availability of laws and regulations to the public and their availability on the international level prior to their entry into force

TABLE 10: TI WEIGHING AND SCORING SCHEMES

Weight		Measure	Scoring scheme
Fixed/internet	Mobile		
0.25	0.2	Information on licensing agreements are publicly available	1: no 0: yes
0.25	0.2	Information on access/interconnection agreements are publicly available	1: no 0: yes
-	0.2	Information on spectrum allocation are publicly available	1: no 0: yes
0.25	0.2	Regulations are available prior entry into force	1: no 0: yes
0.25	0.2	There is a one-stop shop for all procedures of licensing and investment	1: no 0: yes

Barriers related to sector-specific transparency, as well as general transparency issues will be assigned equal relative weights