

---

# The Financial Challenges of the Sub-Saharan Africa Telecoms Boom

---

**Jean-Michel Huet**

**Mouna Romdhane**

**Henri Tcheng**

*June 2010*



**Sub-Saharan Africa  
Program**

The Institut français des relations internationales (Ifri) is a research center and a forum for debate on major international political and economic issues.

Headed by Thierry de Montbrial since its founding in 1979, Ifri is a non-governmental and a non-profit organization.

As an independent think tank, Ifri sets its own research agenda, publishing its findings regularly for a global audience.

Using an interdisciplinary approach, Ifri brings together political and economic decision-makers, researchers and internationally renowned experts to animate its debate and research activities.

With offices in Paris and Brussels, Ifri stands out as one of the rare French think tanks to have positioned itself at the very heart of European debate.

*The opinions expressed in this text  
are the responsibility of the authors alone.*

The Sub-Saharan Africa Program is supported by:



Translated by: Anna Osborne

ISBN: 978-2-86592-726-5  
© All rights reserved, Ifri, 2010

IFRI  
27, RUE DE LA PROCESSION  
75740 PARIS CEDEX 15 – FRANCE  
Tel : +33 (0)1 40 61 60 00  
Fax : +33 (0)1 40 61 60 60  
Email: [ifri@ifri.org](mailto:ifri@ifri.org)

IFRI-BRUXELLES  
RUE MARIE-THERESE, 21  
1000 – BRUXELLES – BELGIQUE  
Tel : +32 (0)2 238 51 10  
Fax : +32 (0)2 238 51 15  
Email: [info.bruxelles@ifri.org](mailto:info.bruxelles@ifri.org)

WEBSITE: [ifri.org](http://ifri.org)

# Contents

---

<b>INTRODUCTION .....</b>	<b>2</b>
<b>THE TELECOMS BOOM IN AFRICA .....</b>	<b>3</b>
<b>Telecoms in Sub-Saharan Africa: a brief overview .....</b>	<b>3</b>
<b>The role of telecommunications development     in the socioeconomic growth of African countries .....</b>	<b>7</b>
<b>IMPACT OF TELECOMS ON FINANCIAL FLOWS.....</b>	<b>11</b>
<b>Telecoms taxes and their key share in the budgets     of countries in Sub-Saharan Africa .....</b>	<b>11</b>
<b>The m-payment boom .....</b>	<b>14</b>
<b>International money transfer services .....</b>	<b>16</b>
<b>THE TELECOMS BUBBLE IN AFRICA: TOWARDS AN OVER-INDEBTEDNESS OF THE MARKET ACTORS? .....</b>	<b>21</b>
<b>Heterogeneous telecoms markets.....</b>	<b>21</b>
<b>Different development strategies used by operators.....</b>	<b>25</b>
<b>Strategies to adapt depending on the level     of market saturation .....</b>	<b>26</b>
<b>Operators confronted by a wall of cash assets .....</b>	<b>27</b>
<b>CONCLUSION.....</b>	<b>31</b>
<b>BIBLIOGRAPHY .....</b>	<b>32</b>

## Introduction

---

In the majority of African economies the telecommunications sector has increased in size considerably, making this sector an undeniable source of economic growth and development. There are three ways in which this phenomenon impacts on the financial sphere. First of all, in African countries, telecoms account for a large part of financial flows. These range from mobile payments to international money transfers, and the impacts are numerous. Secondly, telecoms operators are often major tax payers, a situation which raises many questions regarding the economic stakes for the continent's governments. Finally, with the substantial development in licenses and operators a telecoms bubble is building up in Africa. This bubble will soon be confronted by the difficulty of repaying debts held by the telecoms groups in question. By analyzing these three characteristics the key issues faced by this sector in the coming years can be highlighted.

---

*Henri Tcheng is a partner of the Bearing Point board and is responsible for Telecommunications and Media for Europe, Africa and the Middle East. Jean-Michel Huet is a director of BearingPoint Emerging Markets and Mouna Romdhane, a consultant.*

## **The Telecoms Boom in Africa**

---

The telecoms market in Africa has taken off over the course of the last few years, almost catching up with developed countries.

### ***Telecoms in Sub-Saharan Africa: a brief overview***

Telecoms in Africa have gained considerably in stature in the economies of the majority of countries and as such are an undeniable source of economic growth and development. In the next five years the mobile industry sector should go from 2.8 billion to 4.2 billion subscriptions worldwide. Of these, 90 percent will come from countries with emerging economies and 20 percent from Africa and the Middle East.

Indeed, the number of mobile-service subscribers on the African continent has increased from 51.8 million in 2003<sup>2</sup> to 246 million in 2008<sup>3</sup>. Growth in the mobile and internet market is twice that of the global equivalent. Huge differences exist between countries, but there has been appreciable growth across the continent. Two cases - one from each extreme - confirm overall growth: in South Africa, the penetration rate rose from 36% in 2003 to 83% in 2006; and likewise in Ethiopia the ratio went up from 0.1% in 2003 to 1.09% in 2006<sup>4</sup>. Furthermore, the number of users is far greater than the number of subscribers, especially in Africa, as mobile access is not confined only to those who sign up to an offer or purchase a telephone.

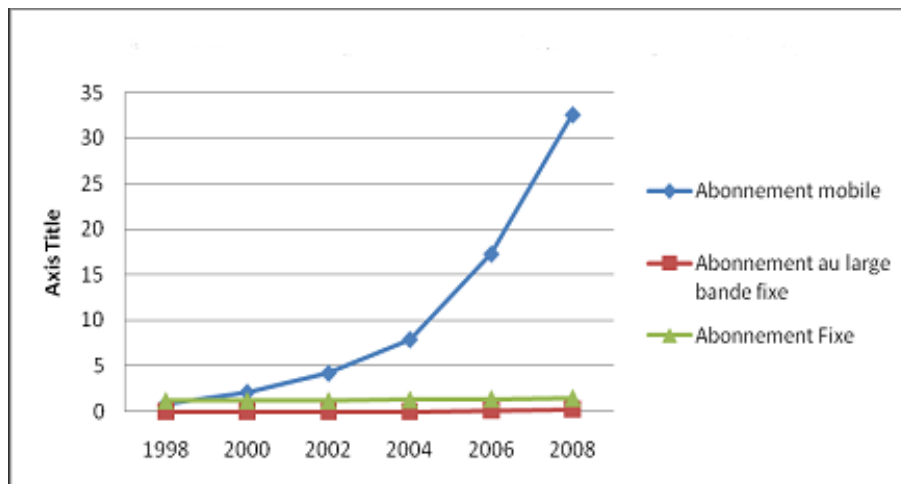
---

<sup>2</sup> International Telecom Union (ITU), 2004, *African Telecommunication Indicators*

<sup>3</sup> ITU, 2009, *African Telecommunication Indicators*

<sup>4</sup> ITU, 2009, *op. cit.*

**Graph 1. Evolution of ITCs in Africa, rate of penetration 1998-2008**



Source: ITU (2009)

The telecoms market in Africa is distinguished mainly through mobile phone usage. Mobile-phone costs are a lot less than fixed network costs, and the set-up time is shorter. In Africa the mobile penetration rate went from 0.8% in 1998 to 33% ten years later, during this same period fixed-line penetration stagnated – rising only slightly from 1.2% to 1.5%<sup>5</sup>. Furthermore, the payment model offered by prepaid mobiles is particularly suited to the income constraints of African households. In 2008, prepaid mobiles accounted for 96% of subscriptions<sup>6</sup>. This type of payment allows the user to choose the cost of his communications without any commitment (pay-as-you-go) through advance purchase of the volume of consumption. By buying a “scratch card” - a name derived from the action of scratching the back of the card to reveal the PIN number - you receive a code which allows you to use an account with a certain number of communication units until credit runs out – this is the “top-up voucher” principle.

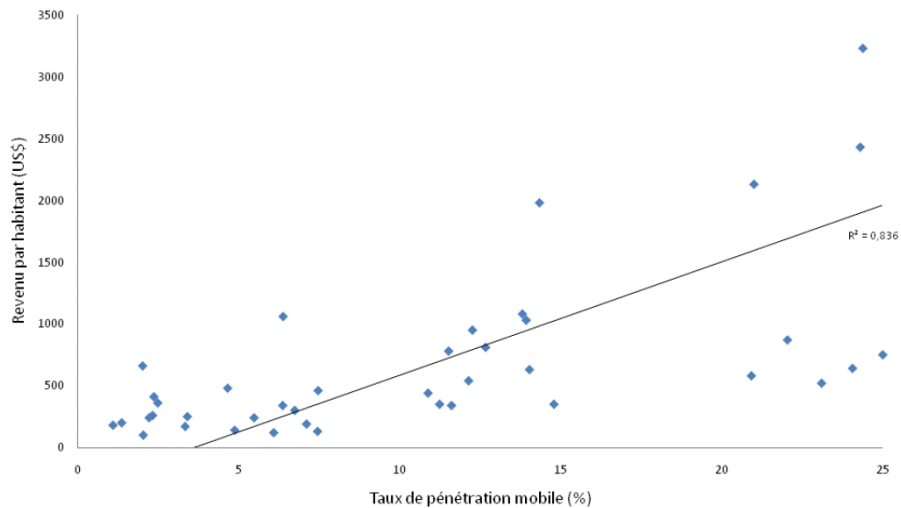
The level of development of the mobile market is not the same in all African countries. Indeed, while the average rate of penetration in Africa was 33% in 2008, the figure for some countries like South Africa, the Seychelles and Gabon stood at more than 90%, but was less than 5% in others, such as Eritrea and Ethiopia. The market contexts are different. In those markets close to saturation actors are pushed to innovate in terms of offers and services to promote a wider product take-up. The markets with lower rates of penetration require major investment by operators to extend the network. One of the key factors explaining the

<sup>5</sup> ITU, 2009, *op.cit.*

<sup>6</sup> “Business Environment and Financing”, *African Economic Outlook*, 2009. In September 2009, *The Economist* refers to the case of Somalia, a country as poor as Ethiopia with a deteriorating political situation, but with a higher level of mobile penetration because of greater market liberalization.

difference between levels of penetration is per capita income. Indeed, there is a positive relationship between per capita income and the rate of mobile penetration (see Graph 2). Thus there is a 'wealth' effect on the size of the available market and its' dynamic. Other macro-economic factors, like the growth of GDP or the urbanization rate, also influence the take-up of different forms of telephone links, but to a lesser extent.

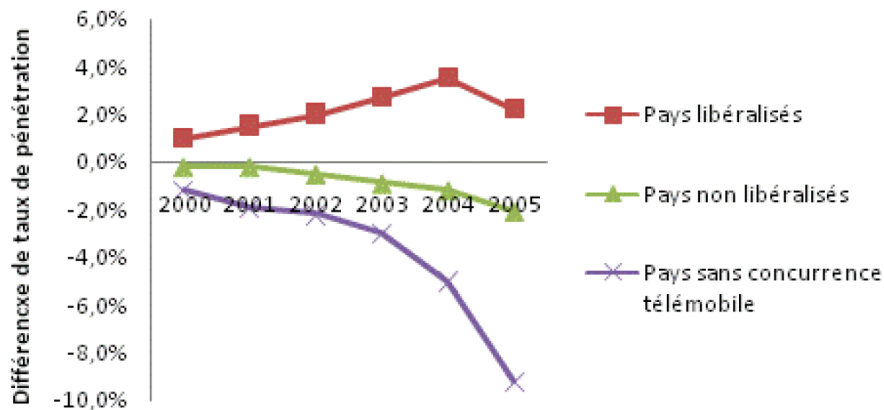
**Graph 2. The correlation between mobile penetration and income per inhabitant in Sub-Saharan Africa**



Source: BearingPoint, 2008

By comparing the penetration levels of countries with the level of liberalization of the telecoms market, the importance and the influence of regulatory policy is emphasized. The different telecoms take-up rates by a population can, to a large extent, be explained by the degree of competitiveness.

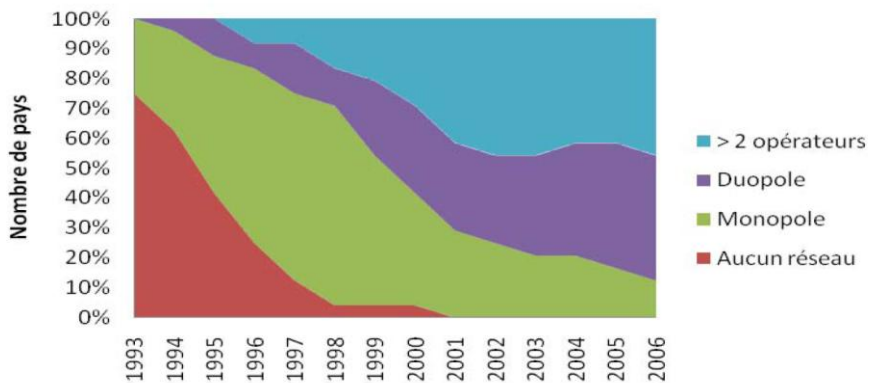
**Graph 3. The difference between the expected levels of mobile penetration and those achieved in countries depending on the degree of liberalization in the telecommunications market.**



Source: Africa Infrastructure Country Diagnostic (AICD)

The unspoiled property of the mobile market attracted foreign investment: the telecommunications sector was viewed as the “goose that lays the golden egg”. The policy of opening the market to competition, established by local governments, threw even more weight behind the development of the telecommunications sector. In this way, the market boom from the early 2000s is often linked to the arrival of a new competitor.

**Graph 4. Status of mobile competition: less than 2 operators, duopoly, monopoly, no network**



Source: AICD



There are less significant disparities in Africa for fixed lines. For example, the rate of fixed-line penetration varies between 0.1% (Ethiopia, 2006) and 28% (Mauritius, 2006)<sup>7</sup>. Even so, usage remains relatively limited in the majority of African countries.

## ***The role of telecommunications development in the socioeconomic growth of African countries***

Earnings from telecoms services account for almost 5% of GDP in African countries. In some countries like Namibia, Ethiopia and Zambia, households devote as much as 10% of their monthly income to telephone use, while the budgetary co-efficient in developed countries is around 3%<sup>8</sup>. The impact of telecommunications products on consumption in African households confirms the role played by telephone links. Mindful of the enormous scale of indirect contributions from Information and Communication Technology (ICT)<sup>9</sup> to their daily lives, users devote a correspondingly large proportion of their budget to it. The positive impact of telecommunications in developing countries, just as elsewhere, has been demonstrated by econometric research. This phenomenon has aroused the interest of many economists, especially over the last ten years or so<sup>10</sup>. A recent study of 38 emerging economies by Wavermann, Meschi and Fuss<sup>11</sup> has shown that between 1996 and 2003, a 10-point increase in mobile penetration led to an additional increase of 0.59% GDP per capita. This percentage was revised upwards in a study by GSMA, carried out in 2006, which confirms that a 10% growth in mobile penetration leads to a 1.2% increase in the GDP growth rate in a Sub-Saharan African country<sup>12</sup>.

---

<sup>7</sup> ITU, 2007, "African Telecommunications Indicators".

<sup>8</sup> In 2006, according to INSEE, the equivalent rate in France was 2.4%

<sup>9</sup> Information and communication technologies (ICT) refer to the techniques used in the treatment and transmission of information mainly by computers, the internet and telecommunications. By extension, their economic sector of activity is chosen by them.

<sup>10</sup> Amongst the most striking studies: A.Hardy, "The role of the telephone in economic development", *Telecommunications Policy*, 4(4), 1980, p.278-286; B.Bruno et al., *Village Telephones: Socio-economic Impact and Implications for Rural Futures*, paper presented at the 6<sup>th</sup> International Conference on Thai Studies, October 1996; B.Wellenius, *Extending Telecommunications Beyond the Market: Towards a universal service in competitive markets*, World Bank, 2000; L-H. Roeller and L. Waverman, "Telecommunications Infrastructure and Economic Development: A Simultaneous Approach", *American Economic Review*, 2001, vol. 91, No 4, p. 909-23; D.Coyle, "Overview", in *Africa: The impact of mobile phones*, *The Vodafone Policy Papers Series*, No 2, 2005, p. 3-9; H. Tchong, J-M. Huet, I. Viennois, M. Romdhane, "Telecommunications and development in Africa", *Expansion Management Review*, summer 2008, p. 114-124.

<sup>11</sup> L.Waverman, M. Meschi and M. Fuss, "The Impact of Telecoms on Economic Growth in Developing Countries", in *Africa: The impact of mobile phones*, op. cit., p. 10-23.

<sup>12</sup> GSM Association report, "Global mobile tax review 2006-7" (a worldwide study on the taxation of the mobile telephone sector 2006-2007), [www.gsmworld.com](http://www.gsmworld.com). The papers published by the GSMA are interesting and contribute to the debate.

This impact can be explained by the nature of these technologies. Telecommunications, as a multipurpose technology<sup>13</sup>, replaces certain failing “utilities”<sup>14</sup>, as in the case of transport infrastructure. Mobile telephone links allow substantial savings to be made in terms of the cost of transport. Bearing in mind the state of the roads and the not insignificant size of the territories, several African regions lack adequate transport and distribution networks. In addition, by using telecommunications, farmers are able to keep themselves updated on the market rate in town without having to go there. In Uganda, FoodNet created a database integrating, via SMS, information about certain farming products, as well as their wholesale and retail prices. Thanks to daily updates, farmers can find the best available price without having to visit different markets. Another interesting example, a system of virtual recharge (e-recharge) has also been established in Madagascar to meet the difficulties of deliveries, given the inaccessibility and remoteness of certain locations. Top-ups of call minutes is carried out mobile-to-mobile (client to salesperson) via a secure connection. In June 2009, MTN, Google and the Grameen Foundation launched the AppLab (Laboratory Applications) providing access to a pan-African database containing agricultural advice such as weather forecasts, veterinary and plant advice via mobiles.

The fallout from communications technologies is directly visible from the creation of thousands of jobs and from the size of gains made. It is, however, indirectly visible from the appearance of new goods and services contributing to the maintenance of activities in other sectors. The speeding-up of information dissemination, which has been developed thanks to telecommunications, plays an undeniable role in economic development. Rural zones are connected to major towns, distances are reduced and links woven between people. It is a structuring element, because the cost of transport can sometimes act as a brake on development. Yet, the direct impact of growth from the telecoms sector is measurable through job creation. According to Frontier Economics<sup>15</sup>, the mobile telecoms market in Sub-Saharan Africa created work, both directly and indirectly, for over 3.5 million people in 2007. In Nigeria, the telecommunications sector and, in particular, that of mobile telephone links, is considered the main direct

---

Nevertheless, the intense government lobbying activities of this association on behalf of telecommunications operators should be borne in mind.

<sup>13</sup> The definition of “General Purpose Technologies (GPT)” (according to ITU, “World Telecommunication/ICT Development Report 2006: Measuring ICT for social and economic development”). ICTs are actually “basic” or “general-purpose” technologies. These technologies have three characteristics which highlight their ability to contribute to the development of other entire sections of the economy.

1) Pervasiveness – these technologies are present in most sectors. 2) Improvement – they are continually evolving, thus contributing to the lowering of costs for users.

3) Innovation spread – in addition to their own evolution, these technologies contribute to the development of new products or processes.

<sup>14</sup> *Utilities*: a private business agency providing, in accordance with government policy, basic services to the community e.g. water, electricity, transport, and communication.

<sup>15</sup> Report from the GSM Association, *op.cit.*

and indirect creator of manual jobs - 400,000 new jobs according to ITU. Thanks to growth in the mobile telephone sector, the number of positions e.g. manufacturers, administrators, network builders, system managers, etc., has risen sharply. The direct creation of jobs is more significant than in Europe because of the nature of the market. The prepaid card system requires a considerably larger distribution network than those established in Western countries. This network - composed mainly of street vendors - has a more important function in some African countries than the direct or indirect role of agencies and shops.

Mobile telecommunications are more than just job creation; they allow for the formation of a truly entrepreneurial spirit. ICT using mobile telephones has given women the chance to create their own businesses. This "helping hand" can be seen through the "Village Phone" program initially established by Grameen Telecom in Bangladesh and then later extended to Uganda and Rwanda. Thanks to connections across rural areas, women from villages, who initially had a small income, were able to borrow enough money to buy into a scheme and the payment of all the expenses incurred from the creation of their own payphone services. This idea developed by Grameen Telecom, in cooperation with the Grameen Bank, allowed these women to run their own businesses. They also received training in operating techniques and tariffs. Operators of "Village Phone" receive a wage which is twice the average national income. The number of indirect jobs created is estimated at 100,000 - this figure includes intermediaries, agents, entrepreneurs, providers and operators for "Village Phone".

On the Enterprise market, jobs are also created in their thousands thanks to telecoms. The best-known example is the opportunity, offered by the development of telecommunication infrastructures, by the relocation of service industries such as call centers (Senegal) or centers for digitization of content (Madagascar).

ICTs also play an undeniable role in social development. Distance learning is an interesting case to look at more closely. Given the lack of teachers and learning establishments in the majority of African countries, distance learning is an important tool in educational development. The stakes are high as Sub-Saharan Africa has particularly low literacy rates ranging, in 2007, from 23% in Mali to 88% in South Africa according to UNESCO. The virtual classroom presents an opportunity to meet educational needs through the redefinition of geographic, human and financial constraints. This system increases the opportunities for the poorest students to access education. According to the World Bank, the establishment of a virtual classroom system at the University of Natal in South Africa led to a rise in the number of students enrolled to study educational sciences from 491 to 3810 over a five-year period. The African Virtual University (AVU) is another successful example of virtual learning. Since July 1997, AVU has been training scientists, engineers, technicians, business people and other professionals capable of contributing to the development of their countries. These scientific and technical training courses, transmitted by satellite, bridge the material and teacher gap. More than 9000 students across

Sub-Saharan Africa have been able to benefit from these new teaching methods. AVU's success has enabled it to form 22 partnerships with other universities of Sub-Saharan Africa.

The teaching content stems from the educational expectations of each country. Bearing in mind the enormous variations between the different regions in Africa, virtual teaching is either adapted for higher education, via university training, or for continuing education: in other words, there is more elementary training with teaching of the basics such as reading and writing. Training needs are determined case by case based on local characteristics, which are reflected in certain socio-demographic statistics: the literacy rate, Human Development Index (HDI), life expectancy and urbanization rate. Thus, oral content will be favored in the areas where the literacy rate is low. Technological support has to be the simplest, cheapest and most adaptable to the socio-economic situation. The most appropriate teaching support for the population is worked out contingent on its accessibility via technological capacities estimated in the short-term. For example, teaching via the internet is inconceivable in regions not connected to high-speed frequencies. The cost of accessing the chosen technology is another key factor in the take-up of the implemented system. There is a range of advantages to virtual teaching in the African context. First of all, it is available to students in more remote areas as well as those in towns: this teaching method overcomes the problems of slow and tiresome transport. Furthermore, participants can continue to work part-time to support themselves. Also, on-line learning facilitates exchanges between students from diverse regions, even different countries, encouraging the development of networks. Finally, students become familiar with the IT tools available to them, a useful asset in the professional world.

## **Impact of Telecoms on Financial Flows**

---

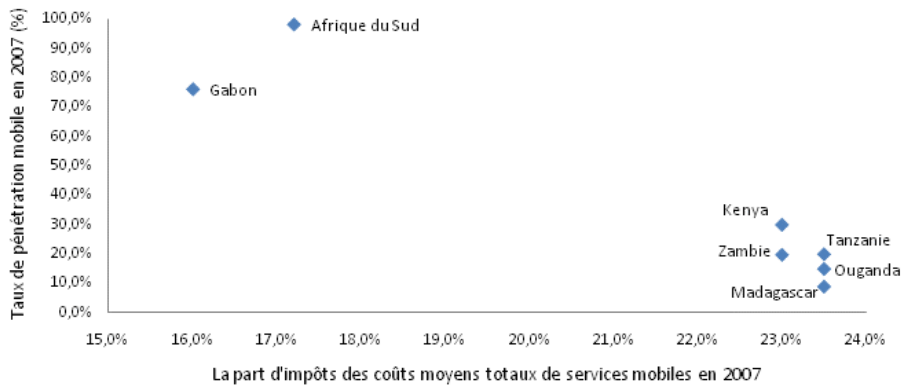
Telecoms now exert a strong influence on financial flows in developing countries.

In Africa telecoms have become highly significant in the economies of the majority of countries, changing the financial landscape. This has left its mark on state finances. Telecoms taxes are highly significant tax revenues for African governments. Nowadays, with electronic transactions carried out via telecoms channels, Sub-Saharan states are able to follow operators' activities more easily and the traceability of transactions has meant easier taxation of telecoms products. Other financial outcomes have also been observed. Economic transactions have moved on from their informal status of bartering and trading in cash towards a revenue-generating market. Despite the predominance of cash culture in Sub-Saharan Africa, telecoms development, especially through prepaid mobiles, has introduced users to virtual money transfers: cash is used to buy a "scratch card", which then becomes "communication minutes" (talk time). Once topped up, these minutes can then either be used as communication units or to buy products using the mobile payment solution. The spread of telecoms reinforces the take-up of new uses: domestic or international money transfers, business via mobiles, etc.

### ***Telecoms taxes and their key share in the budgets of countries in Sub-Saharan Africa***

Telecoms exert an undeniable influence on the economic growth of a country, hence government efforts to promote this sector. Liberalization of policy contributes significantly to telecoms revenues and consequently to the GDP of the country concerned.

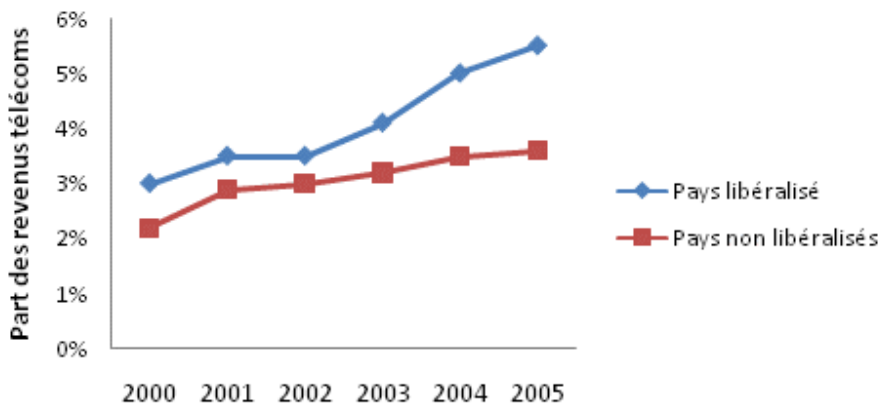
**Graph 5. Mobile penetration compared with the average tax levied per connection in Sub-Saharan Africa (2007)**



Source: AICD (2008)

Even if African states open their markets to competition in order to promote growth in this sector, the fiscal policy adopted by the majority of regions is still restrictive for telecoms actors. Governments levy heavy taxes from operators. The latter, particularly when they are in a monopoly or a weak duopoly, recoup these extra costs (interconnectivity, tax, etc.) from users and consequently hold back the development of the market. If there had been a reduction in taxes levied in 2007, an additional 43 million people would have been able to take up offers for mobile telephone links. Therefore, a reduction in taxes would allow an extension of network cover and offer telecoms access to isolated regions.

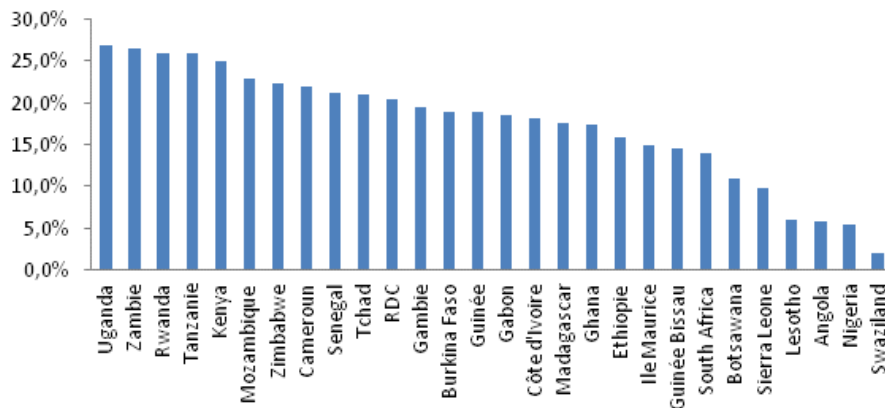
**Graph 6. Growth in the share of telecoms revenues in the GDP of African countries**



Source: GSMA report (2007)

On the other hand, the average cost of access to mobiles could easily be reduced given the significant share of taxes in the total cost.

Graph 7. Share of taxes in the overall cost of mobile access<sup>16</sup>



Source: GSMA report (2007)

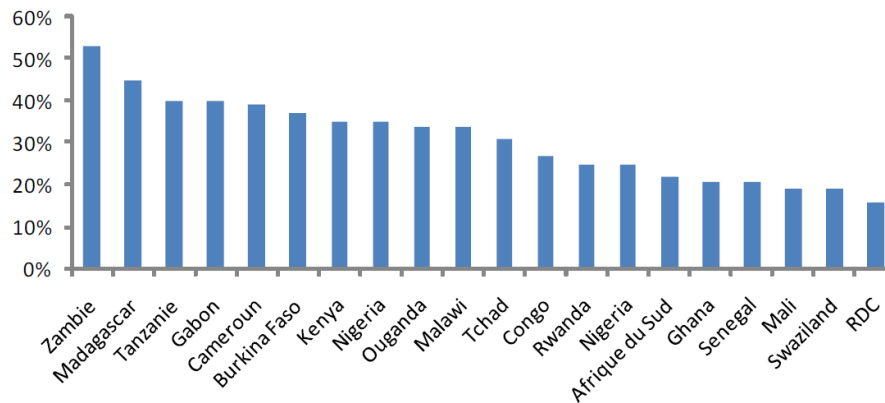
Uganda, Zambia, Rwanda, Tanzania, Kenya, Mozambique, Zimbabwe, Cameroon, Senegal, Chad, DRC, Gambia, Burkina Faso, Guinea, Gabon, Côte d'Ivoire, Madagascar, Ghana, Ethiopia, Mauritius, Guinea-Bissau, South Africa, Botswana, Sierra Leone, Lesotho, Angola, Nigeria, Swaziland.

Currently, telecoms taxes represent a considerable source of revenue for local governments. Indeed, the mobile market generates 71% of all tax revenues for the region. Among the highest percentages are Chad (11%), Congo (10%), Gabon (9%), Tanzania (8%), and Cameroon (8%). The mobile telecommunications sector in Sub-Saharan Africa will generate more than 71 billion dollars in tax revenues between 2000 and 2012. Paradoxically, this figure could be considerably higher if telecoms products were not classed in the fiscal category of luxury products. According to a study carried out by Frontier Economics<sup>17</sup>, the mobile sector is heavily penalized by taxes levied on mobiles, communications and telecoms equipment. Eight Sub-Saharan governments levy a "luxury products" tax on communications, 24 of them on mobile telephones, and more than 25 of them on telecoms equipment. According to the same source, income tax on telecoms operators is more than 30%. Some examples of this are Zambia (53%), Madagascar (45%), Tanzania (40%), Gabon (40%) and Cameroon (39%).

<sup>16</sup> According to the GSMA definition, the total cost of a mobile offer is equivalent to the average annual amount spent by a user so as to have access to a mobile offer. (The cost is calculated from the price of a telephone/length of life + connection cost to the network/ length of life and telephone expenses on communication.)

<sup>17</sup> Report by the GSM Association, *op.cit.*

Graph 8. Share of tax on income from mobile operators (2006)



Source: GSMA report (2007)

Revenues as well as investments are heavily taxed. Between 2000 and 2012, the financing of mobile operators will exceed 85 billion dollars in Sub-Saharan Africa. According to this same study, if taxes ceased to be levied in this sector, actors would invest 13 billion dollars more, thereby generating in excess of 930 million dollars in tax revenues between 2007 and 2012.

In a study, published in 2006, the worldwide association of mobile operators (GSMA) recommends that governments create a telecommunications act which would outline basic measures needed to assure real competition and independence from regulating authorities. They also recommend that governments oversee the application of measures to limit, as far as possible, taxes imposed on mobiles and try to encourage private-sector investments.

## The *m-payment* boom<sup>18</sup>

Through the expansion of telecoms, mobile telephones have become a means to introduce and execute financial transactions on-line with the help of *m-payment*, which is currently achieving unprecedented success.

The role of mobiles in micro-payments does not stop with the incorporation of an electronic purse for remote payments. The mobile also has a key role to play in three different categories of remote payments: purchases direct from an operator, purchases from (and donations to) a third party, and person-to-person transfers. In this way, the mobile speeds up access to services, such as on-line payment, banking services and micro-credit, and fully embraces African cultural usage such as “tontine” systems. *M-payment* paves the way for micro-

<sup>18</sup> *M-payment* refers to services offered by telecoms operators which allow payments to be made via mobile telephones.



financing which has become indispensable for people wanting to start up their own businesses. Amongst the first operators to begin offering mobile payments were Safaricom in 2007 with its “M-PESA” offer, followed by Orange in 2008 which rolled out its “Orange Money” solution in 2008. Subscribers to the system can deposit or withdraw money. Person-to-person money transfers can be made easily by sending a text. Other advantages of the mobile payment are the payment of day rates to employees, the payment of cab fares, and money transfers to friends and family in emergencies. This type of payment is advantageous for both clients and operators: international and domestic person-to-person money transfer costs are reduced – 1\$ for a mobile payment as opposed to 30\$ using previous methods<sup>19</sup>; basic banking-service skills are acquired i.e. management of a bank account, access to micro-credit etc. and new business habits are created such as buying property, crediting an account with minutes remotely, and transferring minutes for domestic and international calls. Moreover, as the use of cash decreases, so does the risk of theft. The benefits of mobile payment are also considerable. As well as generating additional revenues for service host operators, this product renders its current client base loyal while targeting new prospects. In addition, telecoms operators can find new growth areas. By expanding pools of mobile clients in this way, a retroactive effect appears, since this service contributes to the growth of the ICT sector and accentuates the positive impacts of the growth in the telecoms market on the country’s economy. These results also reinforce the social image of the operator. First of all, *m-payment* plays a role in opening up territories. In Kenya, in comparison with capital transfers, which required three days via the post, *m-payment* remains the quickest way to transfer funds. Also, it is the only way to cover the 38% of the rural Kenyan population without access to a banking service.

There are two main, non-exclusive relationship models between banks and telecoms which can be observed in the African markets and which seem to be favorable to the development of mobile payments.

Substitution model: if banks have little latitude locally then the telecoms operators alone can propose a solution.

Cooperation model: banks and telecoms operators form partnerships at the same time as maintaining their initial roles in the value chain of mobile payment.

In general, the actors on the telecoms market replace the banking sector, in particular when mobile-oriented solutions are developed - the operator controls the entire value chain, from creation to account management to payment. This banking solution essentially

---

<sup>19</sup> This difference can be put down either to the different management model, or to the quasi-duopoly of Western Union and Money Gram in Africa. When transferring money by traditional means, the commission rate for money transfers accounts for, on average, 5.6% of the total sum: this rate oscillates between 10% and 25% in Africa according to a study by the International Fund for Agricultural Development presented in October 2007.

targets the non-banking population, which is significant in Africa. According to the World Bank, only 20% of African households have a bank account. This figure is as low as 15% in Liberia and only 5% in Tanzania. This alternative model can be explained by the weak density of the banking network and by more flexible regulations on mobile payment. In Africa, 60% of 400,000 African villages are covered by the telecoms network, whereas bank agencies are often only present in the large towns. Rural populations therefore have very little access to bank agencies. Banks invest little or nothing in rural areas because of a lack of infrastructure (road and post), low density rates, geographic isolation, etc. Mobile payment services in Africa are definitely less regulated than those in western countries. Nevertheless some restrictions are imposed on the sums transferred, the granting of an electronic license by the central bank or in terms of compatibility between the proposed solutions by the different actors in the market.

Some “cooperation models” also exist on the African continent. Telecoms operators can establish partnerships with actors from the banking sector. This is the case in countries where the rate of extension of banking facilities is relatively high and banking regulations are less restrictive. Indeed, the “bank-oriented” offers – where the bank looks after the creation and the management of the account and the telecoms operator looks after the data transport and publicizes the offer – propose that their subscribers consult their accounts and make local money transfers from one bank account to another via mobiles, bill payments, etc.. All of these services require the opening of a bank account with the partner bank. The MTN Money Services solution is the first offer developed by MTN Banking. This “bank-oriented” solution was born out of the partnership between MTN and a division of South Africa’s Standard Bank. It offers its services to those people who already have a bank account, but who would like to receive and send money via their mobile.

## ***International money transfer services***<sup>20</sup>

The international money transfer service, recently integrated into the m-payment offer, represents a new step in the expanding impact of telecoms on the African economy.

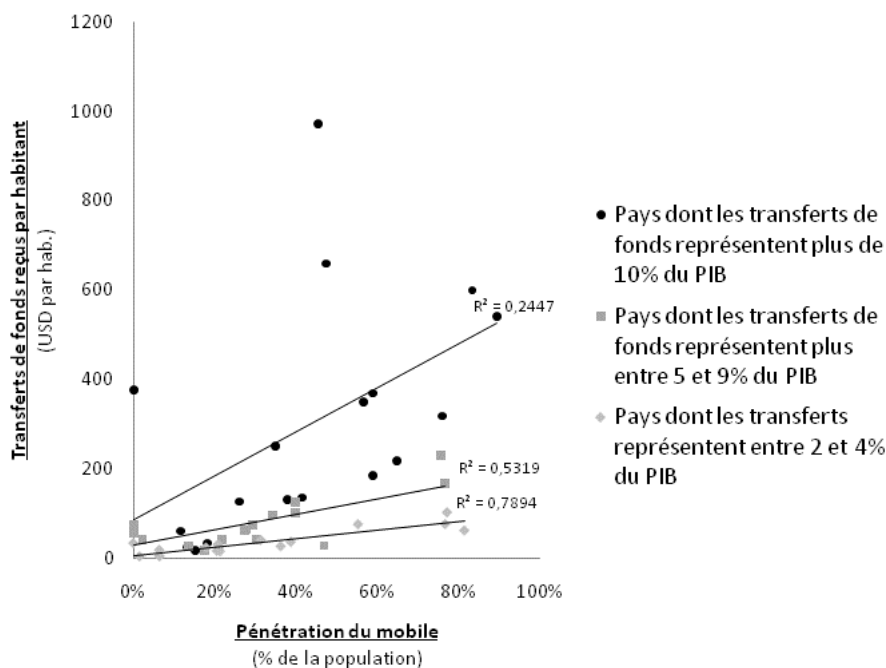
The next step in this dematerialization of financial flows is now being directed by the telecoms operators at the diaspora abroad so as to create traffic internationally via person-to-person transfers between ‘developed’ countries and emerging countries (a partnership between operators in emerging and developed countries.) Taking into consideration the positive impact of the rate of penetration on the sum of funds transferred per inhabitant (cf. Graph 9), money transfers abroad

---

<sup>20</sup> An international money-transfer service is one of the applications *m-payment* offers. Funds can be sent abroad via a mobile telephone.

could prove to be a way to revitalize the economy of emerging countries. The appearance of these financial flows locally and internationally has been encouraged by the speed and security of the fund-transfer flows. It has also served to democratize financial services and loans, savings and insurance.

**Graph 9. Evolution of sums transferred relative to the rate of mobile penetration**



Source: Banque Mondiale, Analyse BearingPoint (2009)

Remittances per inhabitant / Mobile penetration:

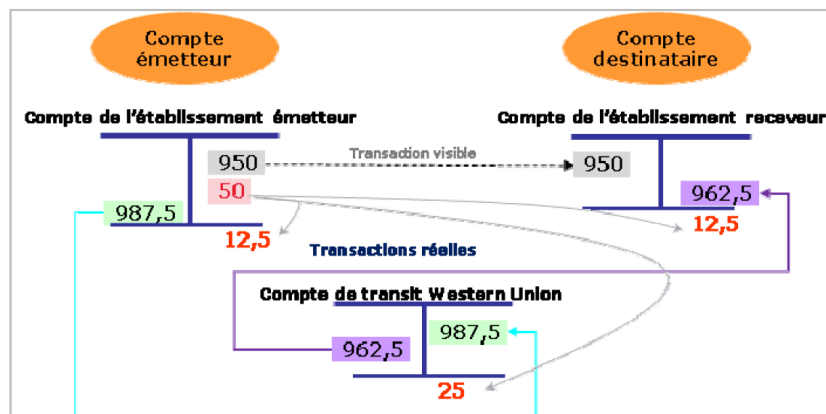
- countries where remittances account for more than 10% of GDP;
- countries where remittances account for between 5% and 9% of GDP;
- countries where remittances account for between 2% and 4% of GDP.

There has been a strong increase in the volume of capital transferred to African countries in general over the last ten years. In fact, sums of money sent to Sub-Saharan Africa have grown continually since 1995, increasing by 11% between 2006 and 2007 alone. The money sent is a form of direct aid destined for families who remain in the countries of origin. More than 80% of these funds go towards meeting basic needs: food, health and education.

Several studies emphasize the growing impact of diaspora remittances on economies with strong migration. A study by the African

Development Bank (AfDB)<sup>21</sup> underlines the socioeconomic and financial impact of migrant remittances in the receiving regions. In some African countries, like the Comoros, their volume constitutes almost 24% of GDP. In 2007 remittances to Sub-Saharan Africa totaled 19 billion dollars, an amount which corresponds to around 2.5% of the region's GDP, according to the World Bank. African governments would like to reduce the informal market sector and the costs associated with transfers. The development of money transfer solutions based on new technologies is part of the recommended route. Elsewhere, some money transfer companies (MTCs) feel they are in competition with payment solutions via mobile telephone links and/or direct debit cards. These are currently the main players in this market and have been present in Africa since the mid-1990s. These players know the rates of growth vary between 35 and 70% each year in each country, according to the AfDB. At present, Western Union is the leader with its market share oscillating between 65 and 100% depending on the country. Thanks to a legitimacy initially gained in America before starting out on other continents, Western Union currently plays a key role as a reputed intermediary (cf. diagram 1) without replacing banks.

**Diagram 1. The international money transfer chain.**



To illustrate (the values shown are fictitious).

For a transfer request a client's deposit of 1000 € - this includes the transfer commission outside the exchange rate - is broken down into 950 € and 50 €. (The 5% commission is divided up with 50% going to Western Union, 25% to the paying establishment and 25% to the receiving establishment.)

Money does not change hands at any time throughout the transfer chain. It is advanced by the 'receiving' establishment. The Western Union account is a reconciliation account. Through this system, the company can also gain funding days thanks to the differential period between the date of payment by the issuer and the date of payment to the receiver.

<sup>21</sup> *Migrant remittances, a development challenge, Comoros, Mali, Morocco, Senegal*, African Development Bank, October 2007

In addition to transfer costs, Western Union can also benefit from an additional payment on the exchange rate applied to the total sum transferred (not shown in the diagram), which is usually different from the current interbank exchange rate. Generally, the higher the amount, the lower the share of the total cost in charges. For example, if a client wants to transfer 50 €, 10 € will be taken in commission; if they wish to send 500 €, 30 € will be taken in commission.

Following a pilot money transfer with two Philippine telephone operators (Globe Telecom and Smart Communications), the American company announced its partnership with Orascom Telecom. It is now looking to begin operations in countries where this operator already has an established presence such as Bangladesh, Pakistan, etc..

With the growing development of telephone links and to a lesser extent electronic banking in Africa - with the use of bank cards – it is possible to envisage a new type of international money transfer using cards or telephones. This type of solution is based on the “top-up” concept, real know-how from telecoms operators present in the African continent. Nevertheless, limited knowledge of the banking profession narrows the field of expertise of the telecoms players in this type of market. This is why telecoms operators try to establish strong partnerships with banks and specialized players. Indeed their in-depth knowledge of money channels and command of regulatory constraints pertaining to this market strengthen their legitimacy regarding these money-transfer offers, despite being less popular than operators in countries with limited banking services.

In practical terms, these telecoms solutions allow funds to be transferred by debiting a telephone plan-based contract or an account with talk minutes and crediting a telephone or a “top-up” card. The recipient of the funds has the choice of using the talk time or transforming those minutes into cash at an agency or retail outlet. A communications account would need to be created to allow cash deposits and withdrawals in the form of minutes. This solution does not require a bank account. These operations are made easier by a mechanism of compensation between establishments, like that practised by all Money Transfer Companies (MTCs). Actually, because of local partners, money is not transferred at any time. Instead it is advanced by the receiving establishment. This system allows the intermediary to receive payment thanks to funding days - the differential period between the time of collection by the sending parties and the disbursement by the receiving organisms, transfer fees and the exchange rate applied to the sum transferred, which is usually different from the actual inter-bank exchange rate.

Telecoms companies have generated significant financial flows between different parts of the network: operators and clients, telecoms players and the state, etc.. The very existence of this monetary process stems from the liberalization of markets and the funds invested initially. Operators either acquired permits or involved other players in order to enter the market, and later invested in basic infrastructures. The sheer

amount of money committed could have weakened the financial structure of the related businesses, which are often obliged to get into debt so as to provide the necessary outlay.

# **The Telecoms Bubble in Africa: Towards an Over-Indebtedness of the Market Actors?**

---

The substantial development of licenses and operators has created a telecoms bubble in Africa, one which is not far off being confronted by a cap on liquidities for those involved.

## ***Heterogeneous telecoms markets***

Bearing in mind the heterogeneity of the telecoms markets, operators in Africa do not benefit from the same global economic performance.

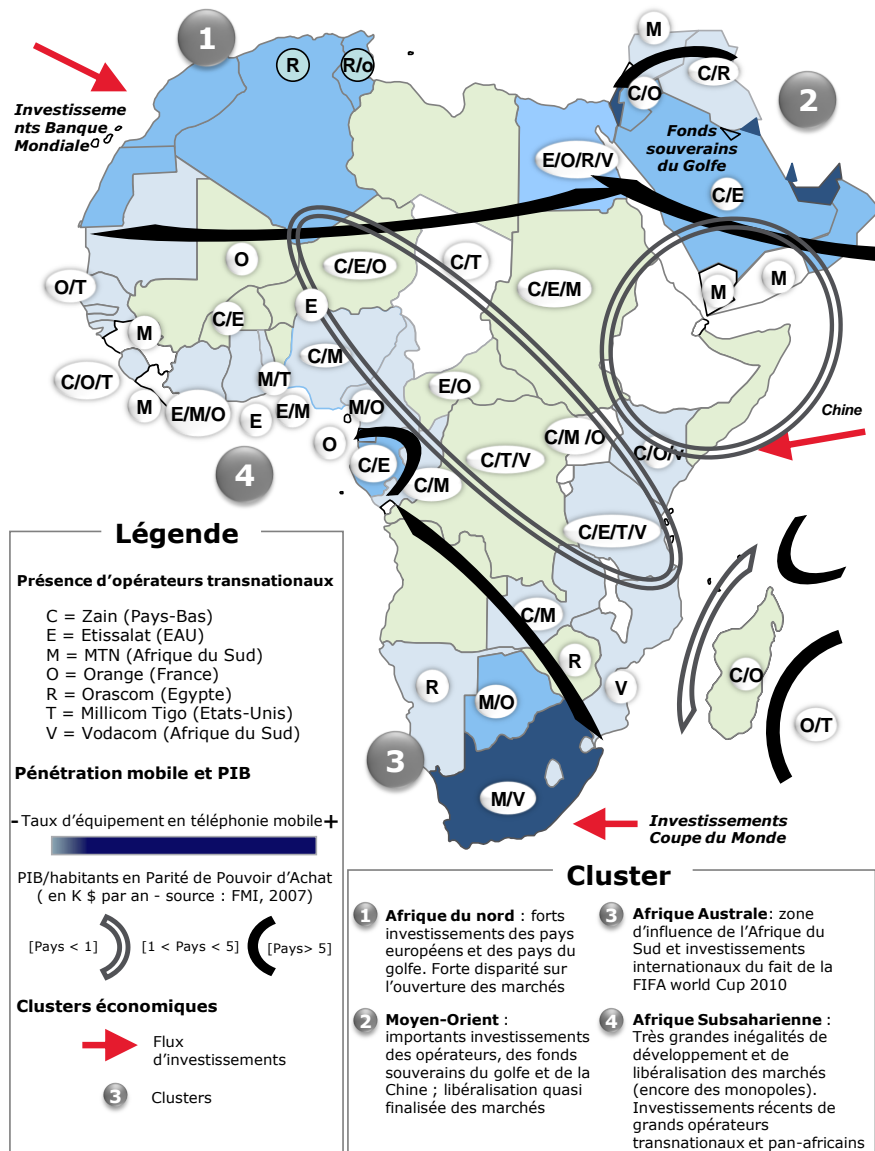
The private sector has for around 15 years been trying to establish a foothold in the telecoms market in Africa. An initial wave of privatizations took place between 1995 and 1997, followed by a second in 2000 and 2001. Today, the majority of countries have privatized their incumbent operators. Nevertheless, Africa is still the continent with the largest number of countries with a monopoly<sup>22</sup>. At present, in Sub-Saharan Africa there are on average 2.7 telecoms operators per country. Within these companies four large types of groups can be found.

- European operators: Orange, Vodafone, Telefonica, Portugal Telecom;
- Operators from the Persian Gulf: Zain, Etisalat, etc.;
- African operators: Orascom, MTN, Vodcom; and
- Local operators: Mascom (Botswana), Comores Telecom.

---

<sup>22</sup> Jose Do-Nascimento, "Mobile phone development in Africa", Paris-XI University.

Map 1. Presence of telecoms operators in Africa



Key presence of trans-national operators

- C = Zain (Netherlands)
- E = Etisalat (UAE)
- M = MTN (South Africa)
- O = Orange (France)
- R = Orascom (Egypt)
- T = Millicom Tigo (U.S.)
- V = Vodacom (South Africa)

Mobile penetration and GDP

Spread of equipment and mobile telephone links

GDP/inhabitant for Purchasing Power Parity (PPP) (in K\$ per year –

source: IMF, 2007)

[Countries ≤ 1] [1 ≤ countries ≤ 5] [countries ≥ 5]

Economic clusters

Investment flow



Clusters

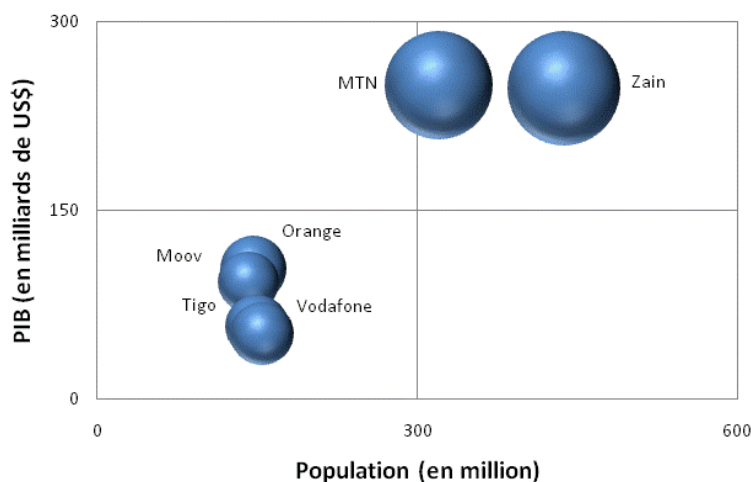
- 1 North Africa: **substantial** investments from European and Gulf countries. Substantial divergences in the openness of markets.
- 2 Middle East: Considerable investment by operators, by sovereign funds from the Gulf and China; liberalization of the markets almost finalized.
- 3 Southern Africa: within South Africa's zone of influence and international investments linked to the FIFA World Cup 2010.
- 4 Sub-Saharan Africa: huge disparities in development and liberalization of markets (monopolies still exist). Recent investments from large transnational and Pan-African operators.

As Map 1 shows, operators are more or less concentrated by geographic zone: Zain, Orascom, and Tigo in Central, East and West Africa, Orange in East and West Africa, Etisalat in Central Africa and Vodafone in Southern Africa.

The Bearing Point board analyzed all the macro- and micro-economic telecoms data from their “*footprint*”. (The term *footprint* is used in the telecoms industry to indicate countries where an operator has a presence.) It does not assess the intrinsic performance of each operator, but only the country where it is present.

The analysis does not include South and North Africa (Mauritania, Morocco, Algeria, Tunisia, Libya and Egypt). Tigo, Moov, Orange and Vodafone have similar overall footprints, even though the number of countries in which each operator is present varies from one player to another: Orange is present in 13 countries, Vodafone in five, Moov in nine and Tigo in seven. Zain, thanks to a buyout of 15 African subsidiaries of Celtel, has the wealthiest and most populous *footprint* and, as a result, the largest number of mobile clients. MTN, with a presence in 16 countries, has a less populous *footprint* but is as rich as its Kuwaiti competitor. This study does not consider Orascom in this section, as it is only present in one country - the Republic of Zimbabwe.

**Graph 10. Macro-economic positioning of players present in Sub-Saharan Africa (the size of the bubble = the number of mobile clients)**



GDP (in billions of US\$)

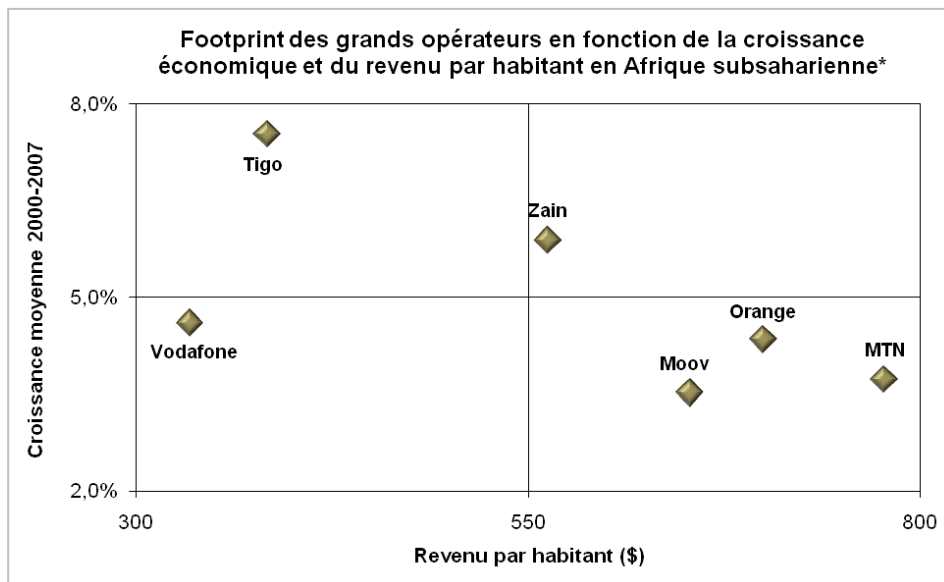
Population (in millions)

Data relative only to Sub-Saharan Africa i.e. Africa not including the Maghreb countries (Morocco, Algeria and Tunisia), Egypt and South Africa.

Source: Bearing Point analysis using IMF, World Bank, OECD and UN data (January 2008)

The results of the *footprint* analysis in the Sub-Saharan African region contingent on levels of economic growth and income per inhabitant differ, in part, from those which would have been obtained, if all African countries had been included. Telecom players have a similar *footprint* to the *footprint* which integrates all African countries, excluding Vodafone. The latter, present in Egypt and Africa, sees its place as being strongly affected by the competition. The countries where it is present in the Sub-Saharan region have an average rate of growth at 5% but with the lowest income per inhabitant.

**Graph 11. Footprint of the leading operators according to economic growth and income per inhabitant in Sub-Saharan Africa  
Average Growth 2000-2007**



Income per inhabitant (\$)

Data relative uniquely to Sub-Saharan Africa (Africa not including the Maghreb countries, Egypt and South Africa)

Source: Bearing Point Analysis using IMF, World Bank, OECD and UN data (January 2008)

To conclude, these leading telecoms groups do not have similar footprints. Disparities between the different acquisition strategies mean that the countries where they are present differ, thereby creating an overall differentiated growth potential in the zone. Nevertheless, given the growth of the telecoms markets in Africa, telecoms operators tend to establish themselves in the largest number of countries possible, so as to obtain maximum benefit from the current weak penetration rate.

## ***Different development strategies used by operators***

The footprints of the main groups studied are expected to evolve, thereby transforming the acquisition strategy of the telecom operators.

The range of players is not fixed, and is constantly evolving. Recent changes, which have taken place since 2008, include the following: MTN invested in Ghana Telecoms by taking control of 70% of the company (August 2008), the Rwandan government allocated a new license to Millicom (November 2008); Orange set up in Uganda (October 2008); and finally, Orascom bought out the operator "Cell One Namibia" (January 2009).

The diverging economic performance between countries where these groups are present and the level of investment necessary creates a disparity of wealth between the players involved. Telecoms operators with a presence on the continent are obliged to invest more in order to expand their client base: through the acquisition either of a license or of an operator in a new country, or by extending their network to remote areas. In a given country, the different ways players react can be explained mainly by the business "context": nature of the society, financing methods favored by the investment policy, and market access, for example through the acquisition of a stake or through the purchase of a license. Different players have distinct ways of behaving. Some of them are even subsidiaries of a major conglomeration. As an example, the private group Orascom has four different activities: telecoms, the hotel trade, the construction industry and IT systems provision. As for France Telecom-Orange, its activities are centered on telecoms. The French state remains France Télécom's main shareholder, with other shareholders not holding more than 5% of its capital. It is not just the nature of the groups, but also the chosen financial systems which influence an operator's global strategy. The leading groups favor two main financing methods for new acquisitions. The first financing strategy, and the most widespread, is to take loans from banking institutions. The second strategy consists of increasing capital, for example by issuing bonds and selling shares, in order to obtain the necessary financing. These financing methods have a follow-on impact on their strategy as operators, who are later pushed to maximize profits to meet repayment deadlines for debts.

## **Strategies to adapt depending on the level of market saturation**

The posture of the operator, however, has to be adapted to local characteristics in each country as well as evolve in accordance with the different stages of market growth. In the initial development period of the mobile market in emerging countries, telecoms operators opted for a domination strategy based on client acquisition. The main objective of the operators' strategy was to maximize their share of the market. The wealthiest inhabitants, those at the top of the income pyramid, were the first to kit themselves out quickly. Later, once the mobile had taken off and at competitive prices, it was possible to tap into the bottom of the pyramid, in other words, the less wealthy section of the population.

The operators' expansion has over the years been boosted by a spectacular increase in the penetration rate within the global population. Today a large section of the telecoms market in Africa is reaching a stagnation plateau as regards the growth of the mobile pool. This easing of the pace does not reflect saturation in the overall market, but only in the wealthiest sector. At the end of this 'extended' phase new challenges arise: on the one hand the need to secure the loyalty of the "high-quality" clients, in other words, to move up-market to encourage more consumption, and at the same time to break into the lower end of the market accentuating quantity rather than quality.

The essence of the operator expansion is the increase in income per client and market penetration, parameters which depend on external factors such as competition, regulation and the politico-economic situation. Therefore these operators are obliged radically to balance their approach between quality on the one side, and volume on the other, by introducing a differentiated strategy.

In order to achieve this, operators focus their efforts on developing new "loyalty" offers for high-end clients and low-price offers to continue their expansion at the lower end of the market. Investment in broadband technologies is a key factor today. Indeed, according to France Telecom's President, "over a period of several years the telecommunications world has gone from a two-layered system of equipment manufacturers and networks to a multilayered system with equipment manufacturers, networks and service and content suppliers".<sup>23</sup>

These extra layers are basically supported by broadband technology<sup>24</sup> (content, VoIP, geolocation).

---

<sup>23</sup> Frederic Paya, France Télécom. North Cape", [www.valeursactuelles.com](http://www.valeursactuelles.com), June 2008.

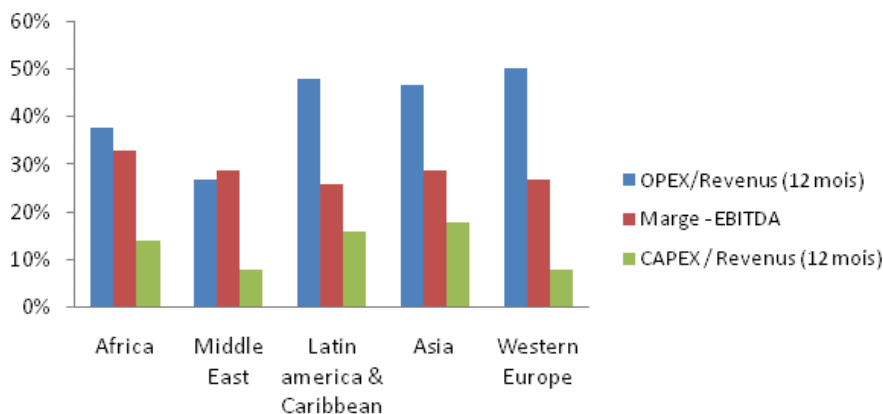
<sup>24</sup> Broadband: a term used for high-speed ADSL both fixed and mobile.

## Operators confronted by a wall of cash assets

Despite the profitability of their businesses, African telecoms operators are coming up against a cap on liquidities – in other words they are having difficulties honoring their repayment of capital and associated interests – and this will probably have an impact on the commercial landscape in the coming years.

In 2008 the mobile market in Africa experienced an average growth rate from a standard subscriber pool<sup>25</sup> of 41% - one of the highest pools in the world. Even so, this ratio is even higher for some leading telecoms groups in certain countries: 52% for Zain, 60% for MTN, 68% for Orange and 82% for Tigo. The difference between the displayed rates can be explained basically by the level of the maturity of the market. Generally speaking, these players obtain good results in terms of margins and the returns on their investments are satisfactory despite the progressive intensification of competition.

**Graph 12. Profit and expenditure for mobile telecoms operators in 2008**



OPEX/Income (12 months)

Margin – EBUTDA

CAPEX/ Income (12 months)

**OPEX** (*Operational expenditure*): running costs

**CAPEX** (*Capital expenditure*): cash flow linked to capital investment expenditure

**EBITDA** (*Earnings before Interest, Taxes, Depreciation, and Amortization*): profit

generated by activities independent of financing conditions, fiscal constraints,

renewal of exploitation tools and risks.

Source: Wireless Intelligence (2008)

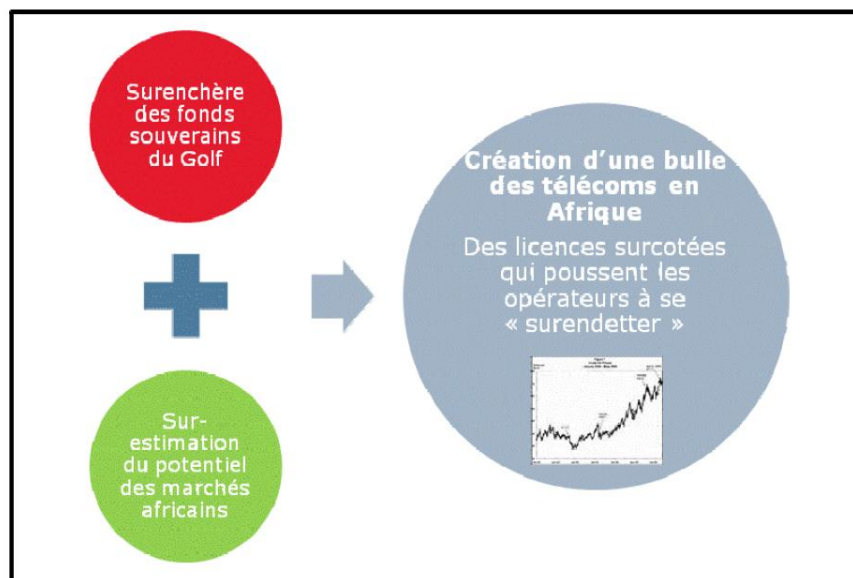
Firstly, the international telecoms operators assured their growth by acquiring licenses or buying out local operators. The speculation connected with license prices in Africa between 1995 and 2005 has, relatively speaking, stopped European telecoms operators from entering the African continent on a scale which reflects their actual industrial

<sup>25</sup> "The Rise of the Pan-African Mobile Operator", *African Economic Outlook*, 2009.

capability<sup>26</sup>. The affluence of the Gulf countries allowed the investment funds concerned to acquire the majority of licenses at “overinflated” prices.

Yet, once in the market, telecoms operators are then confronted by a need to invest significantly in order to launch their activities. Thus, overall, private investment in the telecoms sector on average represented 1.3% of GDP on the continent between 2004 and 2007. This percentage is equivalent to 11.5 billion dollars<sup>27</sup>. Countries with a higher income per inhabitant were targeted first. For example, between 1996 and 2006 France Télécom invested 4.9 billion and Vodafone 3.4 billion dollars. Likewise for South-South investments, Kuwait Mobile Telecommunications injected 3.7 billion dollars, MTN 4.5 billion dollars and Orascom 3.7 billion dollars<sup>28</sup>.

**Diagram 2. The telecoms bubble in Africa**



Higher bids from sovereign wealth funds in the Gulf  
 Plus  
 Overestimation of the potential of African markets  
 Creation of a telecoms bubble in Africa  
 Overpriced licenses push operators to “over-indebt” themselves

<sup>26</sup> Initially France Télécom disengaged from several countries while still maintaining a presence, and then re-engaged in 2007; Vivendi only invested in Maroc Télécom, which has been a development channel for Sub-Saharan African countries since 2007; until 2009 Telefonica had operations in Morocco with Meditel but now concentrates on South America etc.

<sup>27</sup> “Technology Infrastructure and Services in Africa”, *African Economic Outlook*, 2009.

<sup>28</sup> “Africa telecoms attract investors despite the financial crisis”, *African Economic Outlook*, 2009.

Although telecoms operators in Africa return the highest profits in the world, this first phase of “expansion” and growth requires considerable borrowing by these main groups – telecoms operators as well as investors. Indeed, taking into account the cost of licenses and the necessary investments, telecoms investors end up facing a cap on liquidities. The telecoms players have difficulties in meeting repayment deadlines for debts accumulated when they were purchasing licenses and making investments. This phenomenon can be seen on an even larger scale when a distinction is drawn between industrial investors e.g. between worldwide telecoms operators and speculative investors e.g. investment funds. The former are able to benefit from purchases of new subsidiaries so as to absorb some of their costs. It is actually easier for them to optimize certain technical costs (network telecoms, information systems for bills, and technical service platforms), as a way of optimizing tariffs (a common barrier between different countries for example). This logic has been followed by operators from both North and South. By contrast, financial investors have perhaps more significant financial resources, but less room for maneuver – in short none at all – to carry out this type of resource pooling. The impact cost is therefore significantly higher for them, as they have also agreed to pay an additional cost for the purchase of a license/company.

Today the financial situation is more complicated. According to Karim-Michel Nasr (Orascom Telecom), as telecoms operators, they are in a better position than 2001, but financing conditions still leave a good deal to be desired.<sup>29</sup>

An initial public stock offering (IPO) is not an easily imaginable solution. Indeed, the crisis effect is reflected very clearly in the stock-market capitalization of operator groups: Orascom Telecom saw its shares drop 60% in one year, and, while other falls have been less spectacular, they are still considerable: a drop of 19% by MTN, 41% by Sonatel and 24% by Zain<sup>30</sup>

Is reducing activities the best solution? The case of the operator Zain is the most striking example. After paying out 3.4 billion dollars in 2005 to buy all of its African subsidiaries from the Dutch telecoms group Celtel, the Kuwaiti group is currently under pressure to resell all of its African subsidiaries. This would allow it to reduce its debts and to be able to concentrate on and invest in its Middle East subsidiaries. Zain’s debt is estimated today at 5.4 billion dollars, a debt essentially supported by its African subsidiaries. “The Kuwaiti group today has more than 40 million subscribers on the continent [...] and a turnover of more than 4 billion dollars. This figure is so high that the only explanation observers can give for this almost complete withdrawal from such a profitable continent is the wish of the group to achieve solvency.”<sup>31</sup>

---

<sup>29</sup> Aude Lagorce, “Emerging-market telecom buyers get picky”, *MarketWatch*, January 2009.

<sup>30</sup> “Les télécoms africaines résisteront à la **crise**”, *Jeune Afrique*, July 2009.

<sup>31</sup> Walid Kéfi, in the weekly financial newspaper *Les Afriques*, 16 September 2009.

Globally, telecoms operators have incurred more than 14.7 billion dollars of debt during the first four months of 2007 to finance their expansion and acquisition projects.<sup>32</sup>

---

<sup>32</sup> "Telecom Finance in Middle East and Africa Likely to Exceed US\$30 Billion by End of Year", *Business Wire*, May 2007.



## Conclusion

---

The systemic risk linked to the explosion of this telecoms bubble in Africa was not known at the time our analysis was being carried out. A trend towards consolidation has, however, been established and will overcome the need for financing in the short-term. Further growth in this area is conceivable as mobile penetration continues and new uses are being developed.

Yet, the next steps for Sub-Saharan Africa are also going to require investment. Whilst mobile telephone links have been a formidable catalyst for progress, internet access either via PCs or mobiles - the two methods have not yet converged - will be the next big challenge. For this Sub-Saharan Africa lags behind the rest of the world. The stakes are considerable and one could easily predict that the same cycles of investment in networks/equipment, penetration, new uses and profitability will resurface.

## Bibliography

---

African Economic Outlook: <http://www.africaneconomicoutlook.org>

Aker, Jenny C., 15 January 2008, *Does Digital Divide or Provide? The impact of Cell Phones on Grain Markets in Niger*. [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1093374](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1093374)

Aminuzzaman, Salahuddin, Baldersheim, Harald, and Jamil, Ishtiaq, 2003, "Talking Back: Empowerment and mobile phones in rural Bangladesh: A study of the village payphone of Grameen Bank", *Contemporary South Asia* 12(3), p. 327-348.

African Development Bank (AfDB), October 2007, *Migrant Remittances: A development challenge, Comores, Mali, Morocco and Senegal*.

Coyle, Diana, 2005, "Overview", *Africa: The impact of mobile phones*, The Vodafone Policy Paper Series, №2, p. 3-9.

Chowdhury, Shyamal K., 2006. "Investments in ICT – Capital and economic performance of small and medium scale enterprises in East Africa", *Journal of International Development* 18 (4), p. 533 – 552.

Donner, Jonathan, 2004, "Micro-entrepreneurs and mobiles: An exploration of the uses of mobile phones by small business owners in Rwanda", *Information Technologies and International Development* 2 (1), p. 1-21.

Donner, Jonathan, 2005, *The mobile behaviours of Kigali's micro-entrepreneurs: Whom they call and why. In a sense of place: the global and the local in mobile communication*, ed. K. Ny'iri, p. 293-301. Vienna, Passagen Verlag.

Donner, Jonathan, 2003, "The social and economic implications of mobile telephony in Rwanda: An ownership/access typology." *In Thumb culture: The meaning of mobile phones for society*, eds. P.Glotz, S. Bertschi, and C.Locke, p. 37-52. Bielefeld, Transcript Verlag.

Donner, Jonathan, 2006, "The use of mobile phones by micro-entrepreneurs in Kigali, Rwanda: Changes to social and business networks", *Information Technologies and International Development* 3 (2): p. 3-19.

Duncombe, Richard and Richard Heeks, 1999, "Information, ICTs and Small Enterprise: Findings for Botswana, Development Informatics", *Working Papers* № 7, IDPM, University of Manchester.

Garbacz, Christopher, and Thompson, Herbert G, 2007, "Demand for telecommunication services in developing countries", *Telecommunications Policy* 31 (5), p. 276-289.

Grajek, Michal, December 2003, "Estimating Network Effects and Compatibility in Mobile Telecommunications", Wissenschaftszentrum Berlin für Sozialforschung.

Goodman, J., and Wamlia, Vedant, 2006, *A sense of Balance: A Socio-Economic Analysis of Airtime Transfer Services in Egypt*: <http://www.forumforthefuture.org/files/Asenseofbalance.pdf>

GSMA, 2008, L'impact de la taxation sur la croissance de la téléphonie mobile en Afrique subsaharienne.

GSMA, 2007, Global mobile tax review 2006-2007.

Hardy, A, 1980, "The role of the telephone in economic development", *Telecommunications Policy*, 4(4), p. 278-286.

International Telecommunications Union (ITU): <http://www.itu.int>

Kyem, Peter A.Kawku, and LeMaire, Peter Kweku, 2006, "Transforming recent gains in the digital divide into digital opportunities: Africa and the boom in mobile-phone subscription", *Electronic Journal of Information Systems in Developing Countries* 28(5), p. 1-16.

Molony, Thomas S.J., 2005, "I don't trust the phone; it always lies': Trust and information and communication technologies in Tanzanian micro- and small enterprises", *Information Technologies and International Development* 3(4), p. 67-83.

Morawczynski Olga 2008. Surviving in the "dual system": How M-PESA is fostering urban-to-rural remittances in a Kenyan slum: <http://www.nextbillion.net/files/Olga%20Morawczynski-M-PESA-2008.pdf>

Norton, Seth W., 1992, "Transaction Costs, Telecommunications, and the Micro-economics of Macro-economic Growth", *Economic Development and Cultural Change*, 41 (1), p. 175-96.

Hardy, A., 1980, "The role of the telephone in economic development", *Telecommunications Policy*, 4 (4), p. 278-286.

Reynolds, R., Kenny C., Liu., Zhen-Wei Qiang C., 2004, "Networking for foreign direct investment: the telecommunications industry and its effect on investment", *Information Economics and Policy*, vol. 16, p. 159-164.

Roeller, Lars-Hendrik and Waverman, Leonard, 2001, "Telecommunications Infrastructure and Economic Development: A Simultaneous Approach", *American Economic Review*, 91 (4), p. 909-23.

Tcheng, Henri, Huet, Jean-Michel, Viennois, Isabelle, Romdhane, Mouna, Summer 2008, "Télécom et développement en Afrique", *Expansion Management Review*, p. 114-124.

Tcheng, Henri, Huet, Jean-Michel, Blasco, Benjamin, Pages, Jean-Bernard, Romdhane, Mouna, February 2009, « Le paiement mobile, bientôt 'monnaie courante' en Europe ? », *Lettre convergence*, № 14.

Tcheng, Henri, Huet, Jean-Michel, Jbilou, Jaouad, Romdhane, Mouna, September 2009 « Le transfert d'argent international, un pas de plus vers la convergence télécoms-banque », *Journal des télécoms*.

Tcheng, Henri, Huet, Jean-Michel, Romdhane, Mouna, Roubaud, Jennifer, October 2009, « Le télé-enseignement, un espoir pour l'Afrique ? », *Journal des télécoms*.

Waverman, Leonard, Meschi, Meloria and Fuss, Melvyn, 2005, « The Impact of Telecoms on Economic Growth in Developing Countries », *Africa: The impact of mobile phones, The Vodafone Policy Paper Series*, No 2, p. 10-23.

Wellenius, Björn, 2000, "Extending Telecommunications beyond the Market: toward universal service in competitive environments", *World Bank*.