



The Strategic Dimension of Chinese Activities in the Latin American Telecommunications Sector*

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**La dimensión estratégica de actividades
en China en el sector de telecomunicaciones
latinoamericano**

**La dimension stratégique des activités de
la Chine dans le secteur des
télécommunications en Amérique latine**

**A dimensão estratégica das atividades
da China no setor de telecomunicações
da América Latina**

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Abstract. The presence of Chinese companies in the telecommunications arguably has a doubly-strategic character. On one hand, the expansion and accumulation of technological prowess by Chinese companies in these sectors benefits the modernization and diversification of the Chinese economy, and its movement from competitiveness based on wages, to that based on the sophistication and capability of its products. In addition, however, capability by Chinese companies in these sectors particularly in Latin America also has strategic significance from the perspective of how such capabilities could be used by the Chinese state were the current “friendly” global competition between the PRC and the United States to devolve into something more confrontational.

Keywords. Strategic Character, Telecommunications Sector, Chinese Activities, Capability.

Resumen. La presencia de empresas chinas en los sectores de telecomunicaciones podría decirse que tiene un carácter doblemente estratégico. Por un lado, la expansión y acumulación de la capacidad tecnológica de las empresas chinas en esos sectores, beneficia la modernización y la diversificación de la economía china y su enrutamiento hacia la competitividad basada en mejoras salariales, para así lograr la sofisticación y la capacidad de sus productos. Adicionalmente, la capacidad de las empresas chinas en estos sectores, en particular en América Latina, también tiene una importancia estratégica desde el punto de vista de la forma en que esas capacidades podrían ser utilizados por el Estado chino en la actual competencia global amistosa entre la República Popular China y los Estados Unidos, derivando en algo más que una confrontación.

Palabras clave. Carácter estratégico, sector de telecomunicaciones, actividades chinas, capacidad.

Résumé. La présence des entreprises chinoises dans les secteurs des télécommunications, on peut dire qu'elle a un caractère doublement stratégique. D'une part, l'expansion et l'accumulation de capacités technologiques des entreprises chinoises dans ces secteurs, fait du bien à la modernisation et la diversification de l'économie chinoise, et son acheminement à la concurrence fondée sur les augmentations salariales, afin d'atteindre la sophistication et la capacité de produits additionnellement, la capacité des entreprises chinoises dans ces secteurs, en particulier en Amérique latine, a également une importance stratégique du point de vue de la façon dont ces capacités pourraient être utilisées par l'Etat chinois dans le cadre de la compétition mondiale actuelle "amiable" entre la République populaire de Chine et les États-Unis, derivant dans une chose en plus qu'une confrontation.

Mots-clés. Stratégique, télécommunications, activités chinoises, capacité.

Resumo. A presença de empresas chinesas nos setores de telecomunicações tem, caráter duplamente estratégico. Por um lado, a expansão e acumulação de capacidade tecnológica das empresas chinesas nesses setores contribui para modernizar e diversificar a economia chinesa, além de promover a diversificação de setores de alto valor agregado. Por outro, as atividades das empresas chinesas, particularmente na América Latina, têm importância estratégica –do ponto de vista de como esses recursos podem ser usados pelo estado chinês– caso a atual competição global “amigável” entre a RPC e os Estados Unidos evolua para algo mais confrontacional.

Palavras-chave. Estratégico, telecomunicações, atividades chinesas, capacidade.

Introduction

The purpose of this article is not to establish whether or not the activities of Chinese telecommunications companies and the People's Republic of China (PRC) government in Latin America are being conducted with nefarious intent, but rather, to detail their nature and scope, and to analyze what their strategic implications might be. Despite the informal “taboo” against discussing the possibility of a future Sino-US conflict, this article implicitly argues that it is legitimate to analyze

the strategic significance of Chinese telecommunications activities in Latin America based on how the Chinese commercial presence in those sectors could be used in the context of a global conflict between the US and China, without proving that the PRC has explicitly developed plans to use them in this way.

In October 2012, the Permanent Select Committee on Intelligence of the U.S. House of Representatives completed a study and hearings on the activities of the Chinese telecommunication firms Huawei and ZTE, and concluded that their activities raised enough unresolved national security questions to justify their exclusion from contracts for public infrastructure in the US (US House of Representatives, 2012, October 8).

Although a great deal of work has been done on the impact of Chinese trade and investment in Latin American commodity sectors, almost no attention has been given to the activities of Chinese companies in the region's telecommunications sector. One of the few other works, focused specifically on Chinese activities in the Argentine telecommunications and space sector, is Jamie Hulse (Hulse, 2007, September), despite the fact that the sector itself is key not only to the operations of security forces in time of conflict, but is key to the economic functioning social and political interactions of every country in the region.

Following in the spirit of the Committee, this article argues that particular attention should be given to the degree to which Chinese companies have come to occupy a major role in providing of telecommunications architectures across Latin America, given the Committee's conclusion that the PRC "has the means, opportunity, and motive to use telecommunications companies for malicious purposes.

It concluded that "Huawei and ZTE cannot be trusted to be free of foreign state influence and thus pose a security threat to the United States and to our systems," recommending that the Chinese companies be blocked from acquisitions, takeovers and mergers in the United States, and that U.S. government systems and contractors should exclude ZTE or Huawei equipment in their systems (US House of Representatives, 2012, October 8, iv).

Such declarations raise particular concern in a region where the same Huawei and ZTE are the producer of increasingly sophisticated cell phones, modems and other telecommunications devices that contain or have access to a virtually limitless array of data, from the records of the physical movements of their users, to the data stored on or transmitted from their computers, whether personal, commercial, or governmental in character. Such words also merit closer consideration of a situation in which it is virtually impossible to find a government functionary, businessman, or ordinary person in the region whose most sensitive communications and information do not, at some point, pass through a Huawei or ZTE cell phone or data modem, over a Chinese built cell or fiber optic system, or get stored, at least temporarily, on a Lenovo computer.

1. Chinese Activities in the Latin American Telecommunications Sector

In its 2008 White Paper on Latin America, the Chinese government briefly mentioned communications systems as one example in which it sought to advance "practical cooperation" in building the region's infrastructure (China's Policy Paper on Latin America and the Caribbean, 2008, November 6). As with Chinese advances in other infrastructure segments such as work on roads and hydroelectric facilities, in the telecommunications arena, the Chinese government has kept its word.

Today, Chinese firms are major players in virtually every major nation in Central and South America. The advance of Chinese telecom into Latin America has primarily been the story of two companies: Huawei and ZTE, and to a lesser extent, Shanghai Alcatel Bell. In each case, the expansion into Latin America represented part of the broader global expansion of these firms.

Huawei lists a corporate presence in 14 of the nations of Latin America, with a total of 10,000 employees (Latinoamérica, uno de los mercados en mayor crecimiento para Huawei, 2012, October 29) in 19 regional offices, 3 software research and development centers and 3 training centers (Huawei, s. d., Official Website). Indeed, the firm even has a corporate presence in nations such as Paraguay with which the PRC does not have diplomatic relations.

The degree to which Huawei has become a core part of the telecommunications infrastructure of the region is illustrated by its own corporate publicity, in which it notes that it is currently “a leader in market share across a range of different technologies and infrastructures in the region, including being the largest provider for IP DSLAM and Next Generation Network applications, and second in market share for optical networks, and routers and LAN switches for the entire region,” and that it is “embedded in leading edge technology infrastructures across the region, including having built 3rd Generation UMTS infrastructures in Brazil, Mexico, Argentina, Colombia, Venezuela, Chile, Peru and Ecuador.”

Going further, Huawei notes that it has provided technology solutions to almost all of the other major telecom players in the region, including America Movil, Telmex, Telfonica, Millicom, Nextel, TIM, Digicel, CANTV, and CNT (Huawei, s. d., Official Website). From the perspective of Huawei’s own leadership, Latin America is its fastest growing global market, and its largest outside of Asia in terms of the number of persons employed (Latinoamérica, uno de los mercados en mayor crecimiento para Huawei, 2012, October 29).

Although ZTE does not publicly make claims on its own website about its presence in Latin America in the manner that Huawei does, the firm lists 16 offices in the region, including ones in Panama, Paraguay, and Haiti, none of which have diplomatic relations with the PRC.

In general, the expansion of Chinese telecommunication firms in Latin America has been different than that of their Western counterparts. Huawei and ZTE have generally entered each new country-market in the region with a handful of senior executives operating out of small facilities with very low overhead, rather than beginning with an expensive, high-visibility initiative, as have some of their competitors. Indeed, in more than one country in the region, stories exist of Latin American government officials and telecommunication executives conducting high level meetings with Huawei and ZTE executives in modest apartments being simultaneously used by the Chinese as their eating and sleeping spaces.

From such modest beginnings, the advance of Huawei and ZTE in each country has typically involved the winning of small infrastructure contracts enabling the expansion into new facilities, the importation of technical and managerial personnel from China, and the hiring of local workers as a larger presence is built in the country, both respect to the construction of networks, and the sale of products such as cellphones, routers, modems and other devices.

The technical solution offered in Latin America has reportedly drawn heavily on the experience of the companies in China, where, like in Latin America, the telecommunications infrastructure was unreliable and the consumers had very little money for expensive products and contracts. Both Huawei

and ZTE, for example, have been at the forefront of the market in offering extremely inexpensive cell-phones and "pay-as-you go plans" tailored for lower-income persons who traditionally do not enter into service contracts (Telefónica confía en América Latina para implementar su sistema móvil de bajo costo, 2012, October 8).

As they have expanded, however, a decisive factor in the ability of Huawei and ZTE to pursue opportunities at key moments within Latin America and elsewhere has been their ability to count on financing from Chinese banking partners. In Chile, for example an initiative by the firm ZTE to introduce the new Wimax wireless infrastructure in the country was advertised as being backed by the financing of Chinese banks (Empresa china estudia apoyar el desarrollo de banda ancha WiMax en Chile, 2009, March 13).

With respect to their patterns of expansion within the region, both Huawei and ZTE initially focused their efforts on larger countries and markets such as Mexico, Brazil, Argentina and Chile. The projects are described in general terms, in the websites of both companies (Huawei América Latina, s.d.). Then, however, they began to make important advances in the countries of ALBA, where the favorable disposition of ALBA governments toward the PRC expanded opportunities for commercial contracts with those states. Although Huawei and ZTE initially shied away from Central America and the Caribbean where individual national markets were smaller and not all countries diplomatically recognized the PRC, by 2010, both Chinese companies had begun to make important advances there as well.

The expansion of both Huawei and ZTE in the region has included sales of retail products such as cell phones and data modems, as well as providing network services for the region's governments and its major commercial telecommunication providers. By 2010, ZTE was selling telephones under the Movistar brand in Mexico, Colombia, Venezuela, Peru, Ecuador, Argentina, Uruguay and Chile (Teléfono celular de marca blanca llegará a Ecuador, 2010, February 17). In that year, the major Latin American telecommunications service provider Telefónica contracted with ZTE to introduce six ZTE cell phone models onto the market.

In addition to penetrating the cell phone market in general with low cost devices, they have also made important advances by offering low-cost versions of more sophisticated "smart phones," sold both under their own brand names and produced for cellphone service providers. In February 2011, for example, ZTE announced that it was launching a new high-end Android cell phone in the 12 Latin American markets where it has helped to build and operate a network for Movistar (Telefónica and ZTE to Strengthen Smartphone Offer in Latin America with Launch of Movistar Prime, February 17, 2011).

From a strategic perspective, although there is no public evidence of wrongdoing by Huawei or ZTE, smartphones are potentially powerful tools if they were to be used nefariously by those with access to their hardware and internal software, due to the enormous amount of personal data that they poses on those who use them, including not only items such as financial records, email and documents, but also a history of the location of the user, transmitted on a regular basis from a GPS device within the phone itself (Kravets, 2012).

The following sections examine key advances by Huawei, ZTE and other Chinese telecommunications providers with respect to both hardware sales and infrastructure contracts, in individual countries and sub-regions of Latin America.

2. Southern Cone

As noted previously, many of the early efforts of both Huawei and ZTE in penetrating Latin American and Caribbean telecommunications markets focused on the large, middle-income markets of the southern Cone.

For more than a decade, Brazil has been a sub-regional center of gravity for both Huawei and ZTE. Huawei established its first Latin American office in the country in 1999, and as of early 2013, a research center (China's Huawei invests US\$300 million in research centre in Brazil, 2011, April 12) and a series of facilities across the country (Huawei inaugura centro de distribución de US\$61,5mn, 2012, May 31). In May 2012, Huawei announced the establishment of a \$61.5 million electronics production and distribution hub in the Brazilian city of Sorocaba, near the port of Santos, to employ 400 persons, the largest such facility that Huawei has in all of Latin America. Reportedly, the facility will complement the other 11 hubs that Huawei operates in the country to serve both Brazil and the markets of neighboring Latin American states (.). Brazil represented \$2 billion in gross earnings for Huawei in 2012, approximately 2/3 of all of the company's earnings in South America.

With respect to networks, Brazil has also been a focal point for Huawei's deployment of 4G networks in the region—the leading edge telecommunications technology at the time that this work went to press. In February 2011, for example, Huawei was selected by NII holdings, the parent of Nextel in Latin America, to build the organization's next generation networks in Brazil and Mexico (NII Holdings has Selected Huawei as UMTS Supplier in Mexico and Brazil, s. d.). Separately, the new "technology center" established by Huawei in Sao Paulo state was seen as part of the firm's deployment of 4G systems across Brazil, and from Brazil, in neighboring countries. In discussing Huawei's establishment of a technology center in Sao Paulo State, Brazilian Communications minister Paulo Bernardo expressed his hope that the center would help Huawei to implement its new 4G network across the entire country, including providing new coverage to rural areas, then use its base in Brazil as a launching point for deploying its networks more broadly in the region (Chinese telecom company can have technology center in Brazil, 2010, July 11).

Like Huawei, ZTE also maintains a hub in Brazil, with announced plans to build a high tech industrial park with a research and development center, a \$200 million production plant (Acuerdan instalación de parque industrial de tecnología china en Brasil, 2011, March 28), and training and logistics facility in Hortolandia, Sao Paulo state (Kim, 2011). ZTE's Hortolandia facility, built by renovating the Celestica electronics plant that had operated on the site until closing in 2009, also includes the final assembly of cell phones, allowing ZTE to realize significant tax breaks as a "local" producer, rather than importing its products into the country (ZTE Begins Brazil Expansion, 2011, August 15).

Like Huawei, but on a smaller scale, ZTE has won various contracts to build infrastructure in the country, including an award announced in October 2012 to construct a broadband network in conjunction with its Brazilian partner, TIM (ZTE Completes First Phase of Ultra Broadband Project for TIM Brazil, 2012, October 15).

The focus by Chinese telecommunications firms on the Brazilian market goes beyond Huawei and ZTE, however. In June 2012, for example, China Communications Services, a subsidiary of China Telecom, announced intentions to establish a Latin American operation in Sao Paulo (Chinese Telecom Firms to Expand in Latin America, 2012, June 12), building on a license granted by the Brazilian

government to the parent company in September 2011 to operate in the country (China Telecom sets up unit in Brazil, 2012, June 14).

Beyond Brazil, both Huawei and ZTE have also established a strong presence in the Argentine telecommunication market, including the same type of infrastructure contracts and product sales seen in Brazil, as well as the establishment of production facilities by each in Tierra del Fuego, in the southernmost part of the country, to achieve beneficial tax treatment as a "local" producer. Between Huawei and ZTE, total investment in these facilities in 2011 alone was reportedly \$160 million (Empresa china confirmó inversiones en Tierra del Fuego y tiene previsto fabricar 500 mil celulares, 2011, July 9). The Huawei facility was established in association with local partners New San and BGH (Andrada & Arias, 2011)¹, while ZTE announced a facility there in July 2011 with the same partner, BGH (Alfie, 2011). In addition, the Taiwanese company HTC, which specializes in smartphones, announced its establishment of a production facility in Tierra del Fuego in March 2012 (Llega otra marca china al Sur, 2012, March 9).

With respect to networks, by the end of 2012, Chinese companies in Argentina appeared to be positioning themselves not only as major network provider for the major Latin American telecommunications firms, but potentially to leapfrog commercial providers to monopolize the deployment of 4G technology into the country. In October 2012, as part of a trip to Beijing, Argentine Minister of Planning and Public Investment Julio De Vido reportedly met with representatives of Datang Mobile Communication corporation, where they are believed to have discussed employing the Chinese firm to build the country's entire new fourth generation (4G) cell phone network, rather than the Argentine government auctioning off the required communications bandwidth to commercial providers to build their own networks (Kantor, 2012; Oviedo, 2012).

In Chile, the presence of Huawei and ZTE has been more modest than in Brazil and Argentina, yet still significant. Huawei reportedly registered \$200 million in sales in Chile in 2010, less than a tenth of its activities in Brazil (Tecnológica china Huawei proyecta alza de 50% de ventas en Chile, 2011, June 13). Industry sources note that Huawei is involved as a partner or subcontractor with all of the major commercial operators in Chile, including Telefónica, Entel, and Claro, with a particularly important partnership with Nextel, building the 3G and other networks for the organization in the country, with a focus on rural areas previously lacking in coverage (.). In addition, during the June 2012 visit to Chile by Chinese premier Wen Jiabao, Huawei and ZTE signed various cooperation agreements (Chile y China empujan inversión y proponen duplicar comercio en visita de Wen, 2012, June 26), leading to an announcement in July 2012 that it was opening an "innovation center" in the University of Chile, which would train ZTE engineers (ZTE, Universidad de Chile to Open Innovation Center (2012, July 12). In December 2012, the Chilean minister of Transportation and Telecommunications Pedro Pablo Kuczynski met with leaders from both ZTE and Huawei in China, seeking expanded investment by the Chinese companies in Chile, possibly to include their direct or indirect participation in the construction of new 4G networks in the country, to begin in 2013 (Chile busca aumentar inversión extranjera directa china en sector de telecomunicaciones, 2012, December 10).

As in other countries in the Southern Cone and elsewhere, Huawei and ZTE have also been major cell phone vendors in Chile. Huawei reportedly sold more than 150,000 cell phones there in 2011 (Tecnológica china Huawei proyecta alza de 50% de ventas en Chile, 2011, June 13), including low cost smart phones, significantly expanding its market position (Marca china Huawei lanza en Chile dos nuevos smartphones, 2011, December 10).

1 In the Project, TCL is operating in partnership with the local company Radio Victoria Fueguina.

In Uruguay, although the national market for telecommunications is smaller than those of its southern cone neighbors, the center-left government of Jose Mujica has been receptive to leveraging the Chinese firms to expand and modernize nation's telecommunications architecture, including an accord signed by President Mujica during the visit to the country of Chinese Prime Minister Wen Jiabao, committing Uruguay to even greater cooperation with China in telecommunications (Premier Wen vows to further ties with Uruguay, 2012, June 23). More concretely, in October 2012, state telecommunications organization Antel announced that it was contracting with ZTE to install a new fiber optic network in the country, building on work that it had awarded to ZTE in 2011. Industry analysts note that ZTE is a leader in implementing the technology involved, the next generation "Gigabit Passive Optical Network (GPON), and will have a major role in building and maintaining similar architectures not only in Uruguay, but potentially throughout the region (Antel Selects ZTE for Uruguay National GPON Project, 2011, September 22). During the trip to the southern cone by Chinese Prime Minister Wen Jiabao in June 2012, the government of Uruguay signed an agreement committing the country to even greater cooperation in the telecommunications sector (Premier Wen vows to further ties with Uruguay, 2012, June 23).

3. Alba Regimes

Beyond the expanding base of contract work and product sales by Chinese telecommunications firms in the southern cone, many of their most significant advances have come in the countries of ALBA, aided by the positive disposition of those regimes toward working with the PRC, in combination with the availability of vehicles for financing projects for ALBA government organizations through Chinese banks.

Projects by ALBA regimes with the Chinese span the same gamut of product sales and telecommunication services seen elsewhere, but often in partnership or under contract with the Chinese firm in representation of the Chinese state. The blurring of the boundary between commercial transactions and state-to-state relationships in such cases is particularly problematic, insofar as commercial entities representing a geopolitical rival to the United States (China) are entering often opaque contracts in a strategically important sector with countries in self-declared opposition to the United States, such as Venezuela. In such relationships, the question is not whether, but where concern should begin for the United States, along the spectrum of co-production of telecommunications hardware with the Venezuelan state, exclusive contracts for telecommunications architectures or service and training contracts with ALBA militaries.

Indeed, because the ALBA countries are unique in having contracted with the PRC to develop and launch national communications, data relay and earth observation satellites, work by Chinese telecommunications firms gives the PRC a unique strategic position in having built, and having knowledge of significant portions of the communications, data, and command and control architectures of those countries in the region most hostile to the United States.

Of all the ALBA regimes, the penetration by Chinese telecommunications firms is arguably most extensive in Venezuela. As of 2012, Huawei alone had more than 1,400 workers in Venezuela, of which 400 were Chinese (Tabuas & Sosa, 2012). Since the nationalization of the national telecommunications firm CANTV in 2007, the government has let major contracts to Huawei for the extension of the national fiber optic network to remote rural areas of the country (Venezuela CANTV Selected Huawei Technologies to Upgrade Its Optical Fiber National Backbone Network, 2004, December 31). In addition, evidence suggests that Huawei has been contracted by the Venezuelan

government to implement a command and control system for the Venezuelan defense organization DICOFAN (Suinaga, , s.d.). Similarly, the Venezuelan government has contracted with ZTE to provide cable TV infrastructure for CANTV (ZTE proveerá televisión IP en Venezuela, 2009, April 26), as well as communication antennas and services to the national electric corporation (Créditos pactados con China ascienden a \$30 millardos, 2011, November 25).

Both Huawei and ZTE have also reportedly worked with telecommunications provider Digicel in the preliminary stages of introducing 4G networks into Venezuela (El futuro de la telefonía, 2012, July 10).

Huawei, for its part, has been contracted by the Venezuela government to provide various training and services, including work for the Venezuelan military organization DICOFAN, while ZTE was awarded contracts with the Venezuelan industry of mining and basic industries (Empresa china cobra 159% más por instalar red celular, 2008, August 5). In the latter case, the contracts included a system for real time monitoring of mining activity in the country, of great potential commercial and strategic value to China were ZTE ever to surreptitiously provide information obtained through its construction of the network to the Chinese government or Chinese companies interested in Venezuelan mining (Venezuela implantará sistema chino de monitoreo en minas, 2011, November 24).

With respect to commercial products, both Huawei and ZTE have sold their cell phones and other devices widely in Venezuela, and both have built manufacturing facilities there (Hernández, 2009). ZTE was the first to establish a cell phone factory in Venezuela, building its facility in Punto Fijo, in the Paraguaná Free Trade Zone. The first telephone produced by the plant, called the "Vergatario" was showcased by Venezuelan president Hugo Chávez in May 2009 during one of his frequent television appearances (Chávez celebra el lanzamiento del 'Vergatario', 2009, May 10). Huawei's Venezuelan plant, announced in May 2010 (Presidente anuncia operación de fábrica de celulares Orinoquia, 2010, May 9), was built in Orinoquia, and became operational in December 2012 (Gobierno destaca alta producción de celulares y computadoras, 2012, December 19). Indeed, Huawei went even one step further, announcing in June 2012 that it had chosen Caracas as the site for its first dedicated retail outlet outside of the PRC (Huawei inaugura centro de distribución de US\$61,5mn, 2012, May 31).

In Bolivia, by contrast to Venezuela, the advance of Chinese telecommunications firms has proceeded more slowly, due in part to a lack of funding to develop the Bolivian telecommunications architecture in general. In recent years, however, both Huawei and ZTE have begun to make important advances there. In October 2009, sixteen months after the nationalization of the telecommunications sector by the Bolivian government, the state organization running the sector, Entel, signed a \$120 million contract with Huawei to implement the plan "Total Territorial Coverage" (TCT), with the object of providing service to 1.5 million new users in 12,000 localities (La empresa china Huawei se adjudicó proyecto TCT de Entel, 2009, October 8; ENTEL ejecutará proyecto Territorio con Cobertura Total en 2010, s. d.). The company was also, at the time, working on GSM and 3G networks in support of telecommunication provider Tigo, as well as performing other contracts for Entel and the private firm Viva (La empresa china Huawei se adjudicó proyecto TCT de Entel, 2009, October 8). Despite initial successes in implementing TCT, including building transmission towers and providing services in Oruro (Oruro es declarado territorio con cobertura total, 2010, February 9), Huawei ran into difficulties in completing the contract, and in December 2010, the Bolivian government declared Huawei as non-compliant and charged it a \$8 million fine (Multan con \$US 8 millones a china Huawei por incumplir contrato, 2010, December 22).

The courtship of the Bolivian government by Chinese telecommunications firms was also visible in August 2011, when Bolivian president Evo Morales traveled to the PRC, and included in his agenda

separate meetings with executives from both Huawei and ZTE (Evo Morales pide a los empresarios chinos mayor inversión en Bolivia, 2011, August 11). Indeed, the following month, the Bolivian national telecommunications firm Entel awarded a major contract to Huawei to build infrastructure to expand cell phone coverage to rural areas (Bolivia y China firman 6 acuerdos de cooperación, 2011, September 23).

In Ecuador, the firm Huawei has dominated the market for public telecommunications contracts. From 2007 through 2011, according to a report by the Guayaquil newspaper *El Comercio*, Huawei won 61.4% of all contracts publicly awarded by the National Telecommunications Corporation of Ecuador (CNT), while ZTE won a modest 2.8% (Benítez, 2012). Important specific victories include July 2011, when CNT awarded a contract for construction of a third generation (3G) network to the firm Huawei, together with the firm Alcatel. Ironically, Huawei's closest competitor in the bid was ZTE (2.Alcatel y Huawei logran adjudicación para instalar red 3G, 2011, July 25).

The Ecuadoran case highlights the competition that often exists between Huawei and ZTE in Latin American and other markets. When ZTE lost a competition for video, voice and data services to Huawei in March 2012, despite being the low-cost bidder, a series of public recriminations ensued, including a written protest to Ecuador's president Rafael Correa, leading the Chinese embassy to intervene, directing the Chinese companies to refrain from such activities, lest their actions cause 'diplomatic problems' (Benítez, 2012).

With respect to cellphones and other retail hardware, in 2010, ZTE introduced its product line into the country in conjunction with the telecommunications service provider Telefonica (Movistar traerá a Ecuador nuevos dispositivos móviles, 2010, February 17). In April of the same year, it initiated a project in the city of Chimbo to assemble low-cost cell phones for sale in the Ecuadoran market (Desde Guayaquil se empezará a ensamblar celulares a fin de mes, 2010, October 4), doing the production in partnership with the Ecuadoran state (El Ecuador se dirige a fabricar celulares, 2010, April 13).

Finally, Chinese telecommunications companies have also made significant advances Nicaragua, even though its current regime does not diplomatically recognize the PRC. In January 2011, China's Xinwei Telecom Enterprise group was licensed to operate cell phone and internet services in the country, and has announced plans to invest \$2 billion in the country from 2013-2016 (China's Xinwei to launch phone service in Nicaragua, 2013, January 11), including \$700 million for infrastructure so that it could provide initial service, alongside competitors Claro, Telefónica and Movistar.

4. Other Andean Countries

In the Andean countries not currently part of ALBA, Chinese telecommunications firms have also made rapid advances, although often with a less explicit role for the Latin American government.

In Colombia, for example, both ZTE and Huawei have an established presence across the country, performing government service contracts, and selling cellphones and other products. In 2011, Huawei alone expanded its operations in Colombia by 50%, and by 2012, had a major role in the key telecommunication infrastructure activity in the country—the installation of a 4G 'Long-Term Evolution' (LTE) network in the country (Huawei apuesta por 4G como su 'negocio del año', 2013, March 8). During the course of 2012 as well, both Huawei and ZTE expanded into major new facilities in the Colombian capital city of Bogota.

As of 2013, Huawei was the principal service provider for 3G networks in Colombia for the Tigo, as well as doing similar work for its competitor Movistar (.).

In Peru, Huawei has been active builder of infrastructure for the major telecom service providers, including a key role in the construction of a wideband CDMA network by Nextel in 2011 (Nextel Perú Unveils World's First W-CDMA Network with Push-to-Talk Services, 2011, September 30), as well as a major contract with Telefónica for the modernization of its fixed telephone system. This work reportedly included the installation of a new core network replacing Telefonica's legacy switched system (ZTE IMS to Update Telefónica Group in Perú Fixed Network, 2012, April 23). ZTE has also made significant advances in the country, including the launch in 2011 of the country's first 4G broadband network, in conjunction with Chinese partner VelaTel (formerly ChinaTel) (76. Peru's First 4G Wireless Network Set for Success, 2011, August 3). In July 2012, it was also announced that ZTE would be contributing key parts of the physical infrastructure for a new 2G/3G network to be built in the country by the Vietnamese national telecom provider Viettel, including building more than 2000 base stations for the new network (ZTE se adjudica proyecto de red inalámbrica Nacional 2G/3G con Viettel, 2012, July 11).

As in Colombia, Huawei and ZTE have also made significant inroads in selling their cell phones in Peru; in February 2012, Huawei announced that it was considering the establishment of a cell phone manufacturing facility in the country (Huawei analiza instalar una fábrica en Perú, 2012, February 6).

5. Caribbean Basin

The newest wave of significant advances by Chinese telecommunications companies in Latin America is occurring in the Caribbean basin. Prior to 2007, the subregion was considered a relatively unprofitable market, with numerous individual countries, each with their own autonomous governments, many of which did not recognize the PRC diplomatically. Moreover, the region was dominated by a relatively well established group of established telecommunications providers with strong relationships with local governments, making the prospect for penetration of the market by new entrants difficult.

In 2007, China's absence from the Caribbean telecommunications sector began to change, with Huawei beginning to win a number of important contracts in Trinidad and Tobago (Huawei Deploys WiMAX Network in Trinidad and Tobago, s. d.), Jamaica, Aruba, the Cayman Islands, and Barbados (Huawei and Digicel Deliver Seamless 3G Network in the Caribbean, 2007, March 14). ZTE followed Huawei's lead, developing a smaller, but important presence in Guyana, Guadeloupe (ZTE to Roll out 3G Networks in French Caribbean and Indian Ocean, 2009, February 24) and Haiti (68. Moving Towards 3G with ZTE's All-IP CDMA2000, s.d.), among others.

The expansion of the Chinese telecommunications presence in Cuba during this period had two important components. The first was the use of the Chinese to modernize the Cuban telecommunications infrastructure itself. By the end of 2009, for example, Huawei was working to build a broadband internet service in the country (Hearn, 2002).

The second piece was the use of Chinese firms to connect Cuba to the outside world through fellow ALBA partner nation Venezuela. The work, awarded to Shanghai Alcatel Bell, was completed in February 2011 (Cuba gets fiber-optic cable link to Venezuela, 2011, February 10). with the 1,000 mile cable extending from Camurey, in Venezuela to Siboney, Cuba. A secondary line also links Jamaica

into the system (.). While the project in itself is modest, it has the effect of making Cuba, and to a lesser extent Jamaica, more dependent on the Chinese for international data connectivity.

One of the most significant Chinese telecommunication hubs in the Caribbean is arguably the Dominican Republic, where the firm Huawei has an 80-person office, providing hardware and services to all of the major telecommunications providers: Telmex (operating in Dominica as Claro) the French national telecommunications provider Orange, Tricom, and local wireless broadband provider Wind Telecom. The relationship with Tricom includes an important contract won in July 2012, to upgrade its national network to a 4G LTE system (Tricom implementará nueva red móvil 4g-LTE, 2012, July 2), part of Huawei's strategic aim to deploy 4G LTE throughout the region (Nevar, 2012).

In addition to the Dominican Republic, Chinese telecommunication companies also have a growing presence in Trinidad and Tobago. Although the nation's telecommunication provider TSTT had traditionally bought its equipment from the British company Nortel, in April 2012, Huawei won a \$78 million US dollar contract to supply it components for the new mobile broadband network it was deploying (Lindersay, 2012, April 26). By November 2012, other telecom service providers such as British Telecom were also purchasing Huawei equipment to replace older components (Lindersay, 2012, November 13).

As in other parts of the region, Huawei and ZTE are increasingly selling their cell phones and other telecommunications devices in the Caribbean through major telecommunications providers. In Jamaica in December 2012, for example, Huawei launched a new tablet through the telecommunications company Digicel (Huawei Media Pad 7 Lite: The next big, little thing, 2012, December 4).

Finally, the advance of Huawei and ZTE in the Caribbean basin also includes the often overlooked nations of Suriname and Guyana. In Guyana, one of the first major advances for Chinese telecommunications providers came in December 2010, when the government awarded a \$35 million contract to the Chinese firm Huawei to build a fiber optic cable connection from the capital Georgetown to the city of Latham on the border with Brazil, linking the Guyanese telecommunication infrastructure with that of Brazil (First phase e-governance initiative 85 percent complete, 2012, March 6). According to one telecommunications industry expert interviewed off-the-record for this work, from Brazil, another cable connects to a Huawei-built facility in Venezuela. In addition, the contract also included construction of a 4G WiMax network providing high-speed wireless broadband coverage to the greater Georgetown area (ICT would lead the way forward for Guyana, 2010, December 8). By March 2012, the cable to Brazil was reportedly 85% complete, with follow-on plans to integrate the cable with infrastructure spanning the Guyanese coast from the Surinamese border at Moleson Creek, Corentyne, Berbice to the greater Georgetown area at Parika, East Bank Essequibo (First phase e-governance initiative 85 percent complete, 2012, March 6).

In addition to these contracts, in April 2012, the Chinese telecommunications company Datang acquired a 20% interest in the national Guyanese telecommunications company, Guyana Telephone and Telegraph (37.Gov't sells GT&T shares to Chinese company for US\$30M (2012, April 6)). In the same month, a Chinese company was awarded a contract to build a new 4G LTE infrastructure, with the construction of a data center and transmission towers to provide upgraded internet to the previously mentioned coastal region (GT&T shares buyer linked to Chinese military, 2013, April 13; Guyana, China sign bilateral cooperation projects deal, s. d.).

6. Central America

As in the Caribbean, Chinese companies had very little presence in the telecommunications market of Central America until very recently, arguably for many of the same reasons: the countries of the region were relatively small individual markets comprised of countries which did not diplomatically recognize the PRC, and dominated by companies with strong exclusive relationships with the governments in place. Despite such difficulties, as in the Caribbean, both Huawei and ZTE appear to be advancing in Central America's telecommunications markets.

In Costa Rica, the track record of Huawei in the nation since the country diplomatically recognized the PRC in 2007 has sparked controversy and criminal investigations. During 2007, the Costa Rican national telecommunications company ICE was exploring the upgrade of its wireless network to a 3G architecture from a legacy system comprised of two incompatible systems, one built by Ericson, and the other built by Alcatel. According to telecommunications industry experts, Ericson had the inside track to build the new 3G network, but Huawei worked through the Chinese ambassador Wang Xiaoyuan, newly arrived following the country's change in diplomatic recognition from Taiwan to the PRC, to convince the Costa Rican government to consider a bid by Huawei. Possibly sensing that Huawei now had the inside track, the other two major players in the market, Nokia and Erikson, refrained from responding when the bid was put out by ICE. In August 2008, Huawei submitted a proposal, as the sole bidder, at 159% of what ICE initially estimated the project should cost (*Empresa china estudia apoyar el desarrollo de banda ancha WiMax en Chile*, 2009, March 13), and was eventually awarded the contract (Córdoba, 2012). In 2012, Huawei was subsequently found guilty and fined for having colluded with other telecom providers in the country Nokia, Erikson, and Continex, so that they would refrain from bidding, enabling Huawei to secure a higher price to build the network (González, 2012).

The penetration of Huawei in selling cell phones through different providers to the Costa Rican and other telecommunications markets was illustrated dramatically in February 2013 when the company accidentally shipped a case of 1000 phones purchased by the Costa Rican telecommunications agency ICE, bearing the logo of its competitor, Movistar (*Huawei se disculpa con ICE por confusión con logo de celulares*, 2013, February 8).

In Panamá, although the country itself does not diplomatically recognize the PRC, Huawei maintains alliances with Cable & Wireless Panamá, Telefónica, Digicel, Claro Panamá and Cable Onda to provide networks and consumer telecommunications products to the Panamanian market (Lasso, 2011).

In Honduras, also despite a lack of formal diplomatic relations, a group of Chinese investors reportedly entered in negotiations in 2010 for the acquisition of the state Honduran telecommunication firm Hondutel, although the deal has remained paralyzed due to issues including Chinese insistence that the Honduran state assume liabilities for Hondutel's pension obligations (*Preocupados trabajadores por posible privatización de Hondutel* (2010, October 23).

In Guatemala, ZTE is supporting Telefónica, which is operating in the country as Movistar, against Tigo, and Telmex, operating under the Claro brand.

7. Mexico

With respect to Mexico, both Huawei and ZTE have recognized the importance of the country as a market, and have set up significant telecommunications hubs there. Indeed, for Huawei, the country is currently the headquarters of the company's Latin America operations (Huawei, s. d., Official Website). Huawei has had a presence in Mexico since 2001, including a production facility in Guadalajara (Díaz, 2011), and a center of operations in Mexico City (China Huawei invierte 20 millones de dólares en México, 2006, November 14), subsequently expanded in 2008 to include a new software research-and-development facility (Espera México recibir hasta 900 mdd de inversiones chinas, 2008, July 11). The companies have also had important successes at the local level including a contract by ZTE to provide wireless internet service for all of the capital, cemented following a trip to China by Mexico City's mayor Marcelo Ebrard (Gardmer, 2007).

As in other countries, Huawei has worked with the principal telecommunications companies in Mexico to build their networks. In February 2011, for example, Huawei was selected by Nextel to help the company build its new 3G Universal Mobile Telecommunications System (UMTS) network for all of Mexico (as well as for Brazil), putting Huawei at the heart of systems carrying the telecommunications traffic and data for one of the major networks for both of the largest and most sophisticated telecommunications markets in the region (NII Holdings has Selected Huawei as UMTS Supplier in Mexico and Brazil, s. d.). It was also the technology provider behind a new offering by Mexico's Salinas group, providing integrated television, telephone and data service to Mexican homes (Total Play descarta sinergias en servicios con Cablevisión, 2011, June 1).

As in other parts of the region, industry sources note that Huawei has thoroughly penetrated the Mexican market, not only as a provider of network services, but also as a provider of fixed telephones, cellphones, data modems, and telecommunications software (Díaz, 2011).

As of late 2011, the firm reportedly had 220 employees in Mexico, approximately 30% of whom were from the PRC (ibíd.).

8. Potential Strategic Significance

Both the United States and the PRC recognize the concept of "strategically important" sectors of the economy in which there is a national interest to sustain capability. The very title of the principal economic blueprint of the PRC for managing near-term economic development, for which the 12th and most recent iteration was released in May 2012, is the "Five-Year Plan on National Emerging Industries of Strategic Importance" (Lu, 2012). While executing projects in Latin America in the telecommunications industries may not generate technological breakthroughs for the Chinese companies doing the work, it provides practical experience that leads to incremental advances in those technologies, including applying and adapting them in different contexts and working through associated problems. Similarly, while the Chinese companies may provide the core technologies, working with Latin American partners and clients provides new insights with respect to those technologies.

There is nothing inherently wrong, of course, with the PRC making advances in the telecommunications sector, and indeed, the Chinese would argue that the United States has no right to attempt to "hold the Chinese back" in the development of important technologies such as those represented by the sector. It is simply a reality that must be acknowledged that the good that such

advances generate for the Chinese people and economy also benefits PRC strategic military capabilities that the United States, one day, may have to face. Indeed, in its response to questions by the House Permanent Committee on Intelligence, the Chinese telecommunications firm Huawei acknowledged providing telecommunication products and services to the People's Liberation Army, although accounting for only a small portion of the company's total sales (US House of Representatives. 112th Congress, 2012, October 8, p. 34).² The investigation cited, as further indication of such support, evidence from a former Huawei employee that the organization had provided technology and services to an elite PLA cyberwarfare unit (p. 34).

Beyond the contribution to Chinese military-technical capabilities in general, the construction and maintenance of telecommunications architectures and their associated components in Latin America also arguably creates opportunities for the Chinese to leverage these architectures for commercial and military intelligence collection, and potential disruption and denial in times of war. In its report on Chinese telecommunications firms, for example, the Intelligence Committee of the US House of Representatives argued that "to the extent these companies are influenced by the state, or provide Chinese intelligence services access to telecommunication networks, the opportunity exists for further economic and foreign espionage by a foreign nation-state already known to be a major perpetrator of cyber espionage (*ibíd.*).

In his testimony before the House, then Deputy Assistant Secretary of Defense for the Western Hemisphere Rogelio Pardo-Maurer eloquently distinguished between the absence of a current threat versus the need to consider the implications of present commercial developments for the future, saying that "There is no evidence (...) that Chinese military activities in the Western Hemisphere, including arms sales, at this time pose a direct conventional threat to the United States or its friends and allies," then noted that "We need to be alert to rapidly advancing Chinese capabilities, particularly in fields of intelligence, communications and cyber warfare, and their possible application in the region," and "we encourage other nations in the hemisphere to take a close look at how such activities could possibly be used against them or the United States" (House International Relations Committee, Subcommittee on the Western Hemisphere, 2005, April 6).

US concerns over Chinese information warfare capabilities and cyber-attacks against US government and industry targets are already well documented (*ibíd.*, p. 34). For the Chinese, building telecommunications architectures gives the Chinese designers unique knowledge of the systems, as well as to design in capabilities in either the hardware or software that could be used to collect data traveling over those systems, introduce false information, or degrade or destroy them at the moment of the perpetrator's choosing. The vulnerability created is far larger than is generally understood in an era in which everything from cables and switches to servers and routers to modems and the computers they connect to, to the software that runs on them are, to some extent, made by Chinese companies. The risk applies not only military and other government users, but commercial and private ones as well.

Moreover, although credible sources such as the US Congress have found evidence of questionable ties between Chinese telecommunications firms and the Chinese military and Communist Party (*ibíd.*, pp. 20-22),³ the argument of whether Chinese companies such as Great Wall Industries, Huawei, ZTE,

2 The products acknowledged by Huawei included teleconferencing services and various voice over internet (VoIP) products.

3 The investigation cited questions about the activities of former Huawei board members with PLA ties, as well as the acknowledgement of the existence of a Communist Party committee within the organization.

or Shanghai Alcatel Bell are agents of the Chinese state is, to a large degree, beside the point. Even were such companies purely commercial, they are subject to influence from the PRC government, whether financially, administratively, or personally. As the report of the House Intelligence Committee on Chinese telecommunications firms pointed out, "Even if the company's leadership refused such a request, Chinese intelligence services need only recruit working-level technicians or managers in these companies," while under Chinese law, such companies would be obligated to cooperate with requests from the Chinese government to use their systems or access them for reasons of state security (*ibíd.*, p. 3). It is unrealistic to presume that such collaboration would not occur when the leadership of the companies involved have close ties to both the Chinese Communist Party and the People's Liberation Army, including Huawei, whose founder Ren Zhengfei, was an engineer within the People's Liberation Army (La empresa china Huawei se adjudicó proyecto TCT de Entel, 2009, October 8).

Going beyond the Chinese-built equipment and architectures themselves, Chinese commercial facilities in the region, such as those of ZTE, Huawei, or Shanghai Alcatel Bell provide a cover for personnel and a base for resources in Latin America that could be used in time of conflict even if the products and architectures built by these Chinese commercial companies remained off-limits.

Conclusion

The strategic significance of Chinese activities in the telecommunications sector comes from three sources: (1) Chinese execution of the commercial projects described, in conjunction with local partners, supports technological advances by the Chinese in these sectors, and maintains the corresponding technological base, (2) the act of physically constructing these assets create opportunities for the Chinese to leverage them in the future for information and disruption activities, and (3) the Chinese personnel and operations on the ground in Latin America for the operation and maintenance of these assets could potentially be used against the United States or other actors in the event of a future conflict with the United States.

With respect to telecommunications technology, PRC collaboration with Latin America and the experience that it gains as a builder of networks in the region, working with other major telecommunications companies will presumably make the PRC a more formidable actor with respect to military as well as civilian telecommunications architectures in the future.

For Latin American corporations and government entities, including the military, part of the strategic significance of the Chinese advances in the telecommunications sector described in this paper is that as Chinese presence in the sector increases, by the nature of commercial telecommunications, an increasing portion of data and message traffic will flow through and come to depend on, Chinese-supplied infrastructure.

For many, such analysis may seem preposterous; evidence that there are those in the US predisposed to see the PRC as a threat, and thus looking for reasons to block its peaceful rise. Rather than becoming part of the growing polemic between the United States and the PRC, however, this article should be understood as an open discussion of calculations that both the US and the PRC are surely making about each other, which must be acknowledged with openness, maturity and respect if the US-China relationship more broadly is to be managed effectively.

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