

THE CASE FOR HUAWEI IN AMERICA

Dan Steinbock

No one familiar with the history of this country can deny that congressional committees are useful. It is necessary to investigate before legislating, but the line between investigating and persecuting is a very fine one...

We must remember always that accusation is not proof and that conviction depends upon evidence and due process of law.

Edward R. Murrow: "A Report on Senator Joseph R. McCarthy," *See it Now* (CBS-TV, March 9, 1954)

EXECUTIVE SUMMARY

Starting in a shabby one-room workshop in Shenzhen in the early 1980s, Huawei is today a global giant generating over \$32 billion in annual revenues, with offices in more than 140 countries. During the past few years, unspecified allegations in the U.S. have led to severe anti-market measures to block Huawei's expansion efforts. While Huawei employs 140,000 people worldwide, less than 1.3% of its personnel are in the U.S. In light of business potential, they translate to missed opportunities. The roadblock is not the American marketplace, but the U.S. government. The question is why.

Contested issues are complementary opportunities. During the past decade, Huawei's expansion efforts in the America have been repeatedly rebuffed by the U.S. government. Viewed from the U.S. perspective, Huawei is currently perceived as a threat. However, the company could be seen as an opportunity in M&As, competitiveness, innovation, and network security. All contested issues could be defused and turned into complementary opportunities for Huawei and the U.S. government, companies, innovation and consumers.

- *Huawei's expansion in the U.S. brings jobs, capital and tax revenues.* In 2007, Huawei's effort to buy 3Com was thwarted by political forces. In fall 2010, Sprint Nextel solicited bids for a network upgrade, which might have gone to Huawei had it not been another intervention by the Congress and even by Secretary of Commerce Gary Locke (current U.S. ambassador in China). The intervention cost Sprint \$800 million from its existing costs in the first year of operation alone. In early 2011, U.S. regulators forced Huawei to unravel the purchase of 3Leaf for \$2million. In spring 2012, the Huawei-Symantec joint venture stopped trading. In the absence of substantiated allegations, such interventions translate to missed job creation, capital and tax revenues in America. However, even under these adverse conditions, Huawei has been able to expand its customer momentum with mid-tier companies that play a vital role in the U.S. cyber infrastructure. Such inconsistencies in the government's approach add to the uncertainty.
- *Boosting Competitiveness.* In addition to differentiation and innovation, Huawei continues to exert a major impact on price competition. When it joined bidding for large European telecom-equipment contracts, profit margins plunged to 30%–35%, which supported consumer welfare and competitive leaders. In the U.S., entrenched vendors have a strong motive to deter Huawei from the marketplace. Concurrently, the political debate over foreign multinationals in America reflects the world of the postwar internationalization, even though the idea of a "one-nation one supply chain" dissolved in the ICT sector a long time ago. Through ICT ecosystems, Huawei actually supports the revival of U.S. trade and investment.
- *Supporting Innovation.* At least 10% of revenue is allocated to R&D on an annual basis in Huawei. Currently, the company maintains seven advanced R&D centers in

the U.S. Its investments into local R&D amount to 17% of its revenues annually. In America, this translates to high-quality jobs and productive capital. In addition to state-of-the-art R&D centers, Huawei invests in partnerships with institutions of higher education. Between 2006 and 2011, Huawei's U.S. revenues grew 26-fold, from \$51 million to more than \$1.3 billion, while its R&D investment increased 15-fold, from \$16 million to \$230 million. In 2010, it paid companies in the West (mainly U.S. firms) \$222 million in licensing fees. Huawei brings to America attractive jobs and efficient capital.

- *Ensuring Network Security.* Today, four of every five major telecoms operators worldwide cooperate with Huawei, including those headquartered in the nations that are U.S. allies or support U.S. security alignments. Of the 56 networks that are in use worldwide today, half are deploying Huawei technologies. Due to its efforts to ensure cyber security – an end-to-end global cyber security assurance system, independent third-party testing institutes, opened up source code – Huawei could be seen as a role model for security practices in the ICT sector. It relies on the ABC model: “Assume Nothing, Believe Nothing and Check Everything.” This approach applies to Huawei itself as well, given that two-thirds of its components do not come from the company, but around the world. If the cyber security system is really to be fixed, that requires a multidimensional approach, focusing on the international diplomacy, best practices, international standards, intellectual property, and independent validation.

Chinese multinationals excel in cost-efficiencies. Until the 1980s, advanced-country multinationals dominated FDI flows worldwide. Today, emerging-country multinationals play an increasingly central role in global FDI. Despite their great diversity, they all come from nations in which GDP per capita is substantially lower than in the advanced economies. In particular, Chinese living standards remain a fraction of those in the U.S. In addition to their growing capabilities in differentiation and innovation, Chinese multinationals have superior cost-efficiencies that contribute to U.S. consumer welfare. Nonetheless, U.S. government's efforts to deter the expansion of these multinationals in America are frustrating elite executives in China.

Huawei's leadership is global. Like Sam Walton's Wal-Mart in the U.S., Huawei first created foothold in rural regions, which were neglected by foreign multinationals and Chinese national champions, and only then proceeded to capture urban centers. Huawei's expansion has emulated the geographic momentum of Chinese urbanization. After a difficult transition in the early 2000s, it leveraged its strategy in global markets – starting with developing regions – with the support of U.S. consulting giants, such as IBM. Huawei's global leadership is founded on American lessons on multinational corporate strategy.

Corporate governance to retain human capital. Since 1990, Huawei has rewarded some 65,000 employees with the right to buy Huawei stock. The stock ownership plan has allowed the company to attract and retain talent. Some 98.6% of shares in Huawei belong to employees. Chinese rules prevent companies with large employee ownership

from going public. As Huawei continues to globalize, it will have to comply increasingly with both Chinese and global corporate norms. The current friction on Huawei's corporate governance reflects the company's transition from a regional giant to a global ICT leader.

Huawei's founder has been tragically misunderstood in the U.S. Huawei President Ren Zhengfei has been on the spotlight in the U.S., due to unsubstantiated allegations of his role in the People's Liberation Army (PLA) and the Chinese Communist Party (CCP). Struggling his way from humble circumstances, Ren was not only confronted by the potential of abject poverty that threatened all Chinese lives, but the legacy of the nationalist Kuomintang that led his parents to labor camps in the 1960s. It was Ren's success that paved his way to the PLA's engineering forces, in which he participated five years three decades ago, and the CCP. However, the influence of private entrepreneurs within the party has increased mainly after 2002, with the CCP's goal to open up the Party to business and executives. This policy is in line with Chinese views on inner-party democratization. It could also be seen in line with U.S. goals of democratization. In the absence of substantiated allegations, Ren should not be shunned by the Capitol Hill; he should be a welcome guest and advisor in the development of U.S.-China relations.

Credit lines are a systemic issue in emerging and advanced economies. Huawei's success has been attributed to financial support from the Chinese government. Typically, the allegations of Chinese state subsidies to Huawei surfaced in summer 2010, with the onset of the Eurozone debt crisis. The credit lines made available through Huawei by the banks are designated for Huawei's customers, not to Huawei. The matter of export credit financing is hardly limited to Huawei, China, or even other large emerging economies. It comprises all economies, including the advanced economies.

Wrong messages should not deter Chinese FDI in the U.S. The expansion of Chinese companies has led to significant economic contributions in the foreign markets in which they operate, via job creation and contributions to GDP and local taxes, says the prestigious World Economic Forum. WEF considers Huawei an exemplary case. Nonetheless, almost every reasonable recommendation for positive U.S.-Chinese FDI prospects has been violated in the case of Huawei because

- The case sends an inconsistent and bipartisan message that not all Chinese investment is welcome in America.
- America's inconsistent and unsystematic promotion of FDI from China and elsewhere is a faded relic in the emerging multipolar world in which the U.S. no longer dominates either global FDI or global value chains.
- Anti-market interventions against Huawei represent severe politicization and minimal transparency.
- Far more education is needed to better understand Chinese motives. The case of Huawei also reflects effectively misunderstood Chinese motives.

- The use of “reciprocity,” coupled with opaqueness in decision-making and minimal transparency by some U.S. agencies, is giving rise to a de facto blueprint for mirror-like Chinese measures to protect perceived strategic industries in the mainland.
- **Japanese precedent is inadequate.** As long as Japanese trade was primarily about exports, the U.S.-Japanese friction escalated. When Japanese investment in the U.S. took off, the friction began to dissipate. Today, Japanese companies employ nearly 700,000 Americans. While Chinese companies can learn much from Japanese experiences in the U.S., the arrival of Chinese FDI into the U.S. occurs in a different context. China’s GDP per capita is much lower than that of Japan; whereas China has been far more open to foreign multinationals than Japan (or the U.S.). Japanese companies globalized during the boom years of globalization; whereas Chinese multinationals are going global at a time of rising protectionism and nationalism. Japanese challenge comprised few high-tech industries; whereas Chinese companies reflect both high-tech and low-tech challenges. Japan is America’s key ally in East Asia; whereas China is seen both as a strategic competitor and a cooperator.
- **Different development stages, complementary opportunities.** After three decades of economic reforms and opening-up policies, China’s development is entering a new stage. As China is transitioning to technological maturity, the new stage of growth is most prevalent in those regions where economic reforms were first initiated, such as Shenzhen in the Guangdong province, Huawei’s home base. In the coming decades, China will need advanced technology and know-how, whereas America will need jobs and capital. Due to their different development stages, the assets of these two nations are complementary, which holds great potential for win-win scenarios.

As long as these barriers continue to deter Chinese FDI in the U.S. the unequivocal message is that America is open for business, but not for Chinese business.

The CFIUS actions reflect internationalization of anti-market interventions. The Committee on Foreign Investment in the United States (CFIUS) has historically monitored the impact of and coordinated U.S. policy on foreign investment in the U.S. In the light of the CFIUS actions in the past decade, its controversial decisions and possible use of deterrence as effective policy instrument, proposed lack of transparency, anti-market process and added uncertainty, current proposals to expand CFIUS should be assessed with prudence. The excesses of the CFIUS provide a replicable blueprint for political interventions in the economy. In contrast, increased transparency would support the mandated goals of the CFIUS process, as members of the U.S. intelligence community have rightly argued. Currently, the unintended consequence of the CFIUS actions is the internationalization of anti-market interventions.

There are at least three possible narratives that have been deployed to explain Huawei’s unique fate in the U.S. In each case, Huawei is seen as a threat, not as an opportunity. Only the nature of the threat varies; from security to commercial markets

and military risk. Irrespective of the official rhetoric, the security threat scenario appears to be the dominant approach, but all are based on unstated and unspecified charges.

The Case of Huawei in America argues that, in the contemporary world driven by increasingly global technology innovation, robust security must be accompanied by efficient competition. In this regard, Huawei's challenges in the U.S. may precipitate inefficiencies that could one day compromise the nation's security.

Indeed, a successful outcome in the Huawei case could prove a game-changer by accelerating investment flows into America at a historical moment when inward investment is needed the most. An unsuccessful outcome would have adverse implications in the U.S.-Chinese relations, far beyond Huawei. In the coming decade, more than \$1 trillion in direct Chinese investment is expected to flow worldwide, a significant share of which could be destined for advanced markets such as the United States.

If there truly is a security case to be made against Huawei, its senior executives or its products, then it should be made publicly, in transparent and specific manner. Commercial gains do not justify compromised security. However, if that case does not exist or if it cannot be made, then there is a win-win case for Huawei in America – one that is in line with U.S. interests and U.S. values.

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PREFACE

Until recently, most Huawei-related reports have focused on the alleged risks the company is said to pose in the United States. This report argues that there is a strong case for Huawei in America, in terms of both U.S. interests and U.S. values. It also argues that, if there is any substance to unstated allegations in Washington, these should be specified. In the absence of clearly stated and specified evidence, continued anti-market interventions in the case of Huawei are not in the U.S. interest and do not represent U.S. values.

Today, Huawei is a global trendsetter in the information and communication technology (ICT) sector. I first took a closer look at the company about decade ago, when it was still a marginal player internationally. I could not help but observe three things. Unlike most Chinese telecom equipment giants, it was not state-owned. Second, unlike most of its Chinese peers and many international giants, it made most of its revenues in international markets. And third, it was growing rapidly to become one of the first Chinese global corporate giants. In the past, only Silicon Valley offered such tales of visionary executives who turned an investment of few thousand dollars into multibillion multinational companies, in a decade or two. As Huawei's President Ren Zhengfei has shown, such dreams can also come true in "Silicon Shenzhen."

In the past half a decade, my activities in India, China and America Institute (USA), EU Center (Singapore), and Shanghai Institutes for International Studies (China) have focused increasingly on the debt crises in the advanced economies, the secular growth prospects in the large emerging economies, and the accelerating transformation of the world economy. In this transition, China and Chinese companies play a central role. Among Chinese multinationals, Huawei is one of the greatest pioneers. Against many odds, it has succeeded in China, Asia, Europe, Latin America, the Middle East and Africa. Until recently, the United States has been the sole exception.

Unlike almost all existing studies, the report at hand has been supported by executive interviews at and a visit to Huawei's headquarters in Shenzhen, the legendary Chinese city where Deng Xiaoping initiated economic reforms in the 1980s. These interviews were conducted between April and July 2012. The interviewees include William Plummer, Huawei's vice president for external affairs, who joined its Washington D.C. office in mid-2010. Plummer is a 15-year wireless industry veteran who spent most of that time in senior management positions with Nokia. I am also indebted to John Suffolk, Huawei's Global Cyber Security Officer and former UK Government CIO, who is now in charge of Huawei's cyber security assurance strategy and system. Additionally, I am indebted to John Roesse, Senior Vice President and General Manager of Huawei's North American R&D. Before Huawei, he spent 20 years serving as the CTO of four large telecom and IT companies, including Nortel and Broadcom.

In IPR strategy, I learned a lot from Song Liuping, Chief Legal Officer & President of Corporate Legal Affairs Department. Since joining Huawei in 1997, he has been the driving force for the company's efforts in IPR protection, having successfully completed over 30,000 patent applications. I also learned a lot from Ross Gan, Huawei's

Worldwide Head of Corporate Communications, who has over a decade of experience in PR and communications industry. In industry standards and industrial cooperation, my guide was Richard Brennan, Vice Director of Industry Standards, who represents Huawei at multiple international standards organizations. Prior to joining Huawei in 2008, Brennan managed California Silicon Valley start-ups and pre-IPO companies; he has also served at AT&T. Additionally, I am grateful for Scott Sykes, Vice President of Corporate Media Affairs; Vice President Yonggang Zhu; David Wolf, President & CEO of Wolf Group Asia Ltd.; and numerous Huawei professionals in Shenzhen, Silicon Valley and worldwide.

I learned much about the Huawei way, its history and quest for innovation during a tour in the Exhibition Hall, along with campus tours in the Training Center, Baicao Garden and Data Center. Additionally, I participated in Huawei's Ninth Annual Global Analyst Summit, which was held in Shenzhen in late April 2012. During this three-day summit, Huawei's senior management and executives – including Carrier Network Business Group CEO Ryan Ding, Corporate Controller C.T. Johnson, President of Carrier Network Business Group Bill Zhang, and Executive Vice President Eric Xu – discussed the company's latest developments and strategies across its business lines, and shared their views on the latest ICT trends. It was an extraordinary opportunity to get to know and learn more from Huawei's numerous analysts, their views of Huawei's strategy and growth prospects, as well as the leading media representatives who cover the company.

Today, Huawei is one of the most misunderstood companies in America. In *The Case of Huawei in America*, I hope to cast more light on the rise of Chinese multinationals, Huawei and its people; its global success and corporate governance, the credit controversies, the company's expansion efforts in America, its competitiveness and innovation, and in particular its network security.

Huawei's activities in America are not a threat, but an opportunity to the United States. They will strengthen, not weaken America. Huawei's expanding presence in America is in line not just with U.S. interests, but with U.S. values as well.

This report was made for Huawei. My only condition was full independence in research. The views expressed in *The Case for Huawei in America* are my own. However, it is my hope that this report, for its small part, would add to better understanding of Huawei's leadership, Huawei's role in America, and U.S.-China relations.

July 15, 2012

Dan Steinbock

1. YEARS OF FRUSTRATION

Today, Huawei is a global leader in the ICT sector and provides customers in more than 140 countries with a comprehensive set of advanced products and services that span wire-line, wireless and IP technologies. Huawei products and solutions have been deployed by most of the world's top 50 telecom operators, and its technology helps make communication possible for one-third of the world's population. With 140,000 employees, Huawei's global revenues exceeded \$32.4 billion by the end of 2011.

Despite its global success, Huawei has consistently been rebuffed in attempts to make large investments and land large contracts in America. U.S. government officials have intervened on a number of occasions to block potential acquisitions and equipment contracts. Behind closed doors and the memos that have been leaked to media, the expressed concern is that China and other countries may be using their growing export sectors to develop built-in spying capabilities in U.S. networks.

Anti-Market Interventions

Huawei entered America on Valentine's Day in 2001. Despite repeated bids, its efforts to win a major contract from the top-tier U.S. carriers, AT&T, Sprint, T-Mobile and Verizon have been frustrated not by the marketplace, but by the U.S. government. Just a few examples: In 2007, Huawei's effort to buy 3Com was thwarted by a U.S. government intervention. In fall 2010, Sprint Nextel solicited bids for a network upgrade. Reportedly, Huawei offered a deal that would have saved the carrier at least \$800 million from its existing costs in its first year of operation alone. But members of Congress launched a letter-writing campaign urging Sprint not to include Huawei, and the then-Commerce Secretary (current China Ambassador) Gary Locke called Sprint CEO to convey his "very deep concerns" about the company and national security.¹

These are grave interventions. They would have been warranted if adequate evidence had been disclosed in the process. And this, precisely, is the problem. No allegations have been specified as of yet.

After the failed acquisition of 3Com, a digital electronics manufacturer best known for its computer network infrastructure products, Huawei sought to acquire a defunct California cloud-computing company called 3Leaf Systems in May 2010 for \$2 million. In early 2011, however, U.S. regulators forced it to unravel its purchase of 3Leaf. In spring 2012, following the US government's blockade of several acquisitions, the joint venture between Huawei and Symantec, stopped trading and left the U.S. Several members of Congress, joined by Gary Locke have lobbied hard against the company. Nevertheless, Huawei has consistently and systematically welcomed investigations.

Cold War Concerns

None of the global achievements by Huawei have assuaged U.S. government concerns. In a survey distributed in April 2011, the U.S. Commerce Department asked for a detailed accounting of foreign-made hardware and software on the companies' networks. It also asked about security-related incidents such as the discovery of "unauthorized electronic hardware" or suspicious equipment that can duplicate or redirect data. The survey reflected a "very high-level" concern that China and other countries may be using their growing export sectors to develop built-in spying capabilities in U.S. networks.²

The Commerce Department survey also illustrates the intelligence community's concern that manufacturers may insert spyware after equipment is installed, through either maintenance or automatic software updates. "It's the update function that is the core of the concern," said James Lewis, director of the Technology and Public Policy Program Center for Strategic and International Studies. "Huawei has offered to let people examine their source code to see if it is clean."³

Additionally, the Obama administration invoked the Cold War-era national-security powers, in order to force telecom companies including AT&T Inc. and Verizon Communications, Inc. to divulge confidential information about their networks. Companies that refused to respond would face criminal penalties under the Defense Production Act, a 1950 law allowing the government to manage the wartime economy. The law was invoked sporadically during the Cold War. Both the U.S. Telecom Association and CTIA-The Wireless Association, two major trade groups, said the survey breaks with a tradition of voluntary cooperation between the industry and government over national security measures, expressing their deep concern "by the lack of information regarding how this data is going to be used and shared," in a June 8 letter⁴ to then-Secretary of Commerce Locke. According to the survey, the results were to be shared with the Defense Department. U.S. authorities hoped to outline a map of who made which parts of the nation's networks. The possibility that foreign companies could be seeding equipment with "backdoors" to intercept data crossing U.S. networks could have implications for a global economy in which China plays a central role as a component supplier.⁵

The Obama administration has said little publicly about the matter. Much of the evidence fueling lawmakers' concerns remains classified. However, when one set of allegations are substantiated with another set of allegations, the line between investigation and maltreatment grows thin (**Figure 1-1**). Accordingly, both the Chinese and non-Chinese Huawei executives find the current status quo frustrating, which is reflected in the open letter by Huawei USA chairman Ken Hu: "We sincerely hope that the United States government will carry out a formal investigation on any concerns it may have about Huawei."⁶

Figure 1-1 Allegations Based on Allegations

The U.S.-China Economic and Security Review Commission (USCC) monitors and investigates national security and trade issues between the U.S. and China. In the past decade, it has commissioned many China-related studies. In an analysis of state-owned enterprises, the authors argue that, even if Huawei is not a state-owned enterprise (SOE), it should be regarded as one:

The firm Huawei is a major player in the [Chinese IT] sector, both inside and outside of China. Huawei claims to be a private firm, but observers have long believed the firm to have military ties.¹ Experts believe that the firm is, at a minimum, dominated by the state or a privately owned firm that behaves like a state-owned one.² Either way, it is well known that the firm is receiving significant levels of assistance from the Chinese government to penetrate international markets in recent years.³ The firm is also believed to have advanced Chinese foreign policy interests in Iraq, Iran, and Afghanistan.⁴ The case of Huawei vividly illustrates that the state's ownership share alone does not always dictate the extent to which a firm in China is sensitive to the state's policy directives.⁵

In the above segment, the first footnote actually contains no evidence on Huawei's military ties, only references to allegations that Huawei is a "front" for the People's Liberation Army (PLA). The second footnote includes testimonies of two experts. Derek L. Scissors of CATO views Huawei as a SOE; while Barry Naughton of University of California (San Diego) holds more reservations. The third footnote reflects the allegation that Huawei has received significant assistance from the Chinese government. Again, the footnote offers no evidence of such assistance, but refers to a *Wall Street Journal* story on four U.S. lawmakers who were pressing the FCC to take a closer look at Chinese telecom-equipment makers to consider restrictions that would make it harder for them to do business in the U.S. The fourth footnote claims to substantiate the allegation that Huawei has advanced Chinese foreign policy interests in Iraq, Iran, and Afghanistan. However, it is actually a reference to still another letter by U.S. lawmakers pushing then-Commerce Secretary Locke and Treasury Secretary Geithner to take a closer look at Huawei and other Chinese vendors.

In closer inspection, then, these claims prove to be based on allegations that refer to other allegations, journalistic stories depicting other allegations, U.S. lawmakers' allegations referencing other allegations – that is, allegations based on allegations.

¹ Hille, K. 2011. "Huawei drops US security challenge." *Financial Times*, February 19.

² See "State-owned Enterprises in China: Testimony of Derek L Scissors." *Hearing before the U.S. China Economic and Security Review Commission*. Washington, DC, March 11, 2011.; "State-owned Enterprises in China: Testimony of Barry Naughton." *Hearing before the U.S. China Economic and Security Review Commission*. Washington, DC, March 11, 2011.;

³ Raice, S. 2010. "Lawmakers Urge Scrutiny of Chinese Gear Suppliers." *The Wall Street Journal*, October 20.

⁴ Kyl, J., et al. "Letter to Secretaries Locke and Geithner." February 10, 2011.

⁵ Szamosszegi, A. and Kyle, C. 2011. *An Analysis of State-owned Enterprises and State Capitalism in China*. Prepared by Capital Trade, Inc. U.S.-China Economic and Security Review Commission, October 26, pp. 42-43.

New Concerns

In July 2011, Greg Schaffer of the Department of Homeland Security testified before the House Oversight and Government Reform Committee that the department knew of instances of foreign-made components seeded with cyber-spying technology. However, he declined to provide further details.⁷ The U.S. government has sought to substantiate these concerns with the October 2011 report by the Office of the National Counterintelligence Executive (NCE). According to NCE, foreign economic collection and industrial espionage against the U.S. represent significant and growing threats to the nation's prosperity and security.⁸

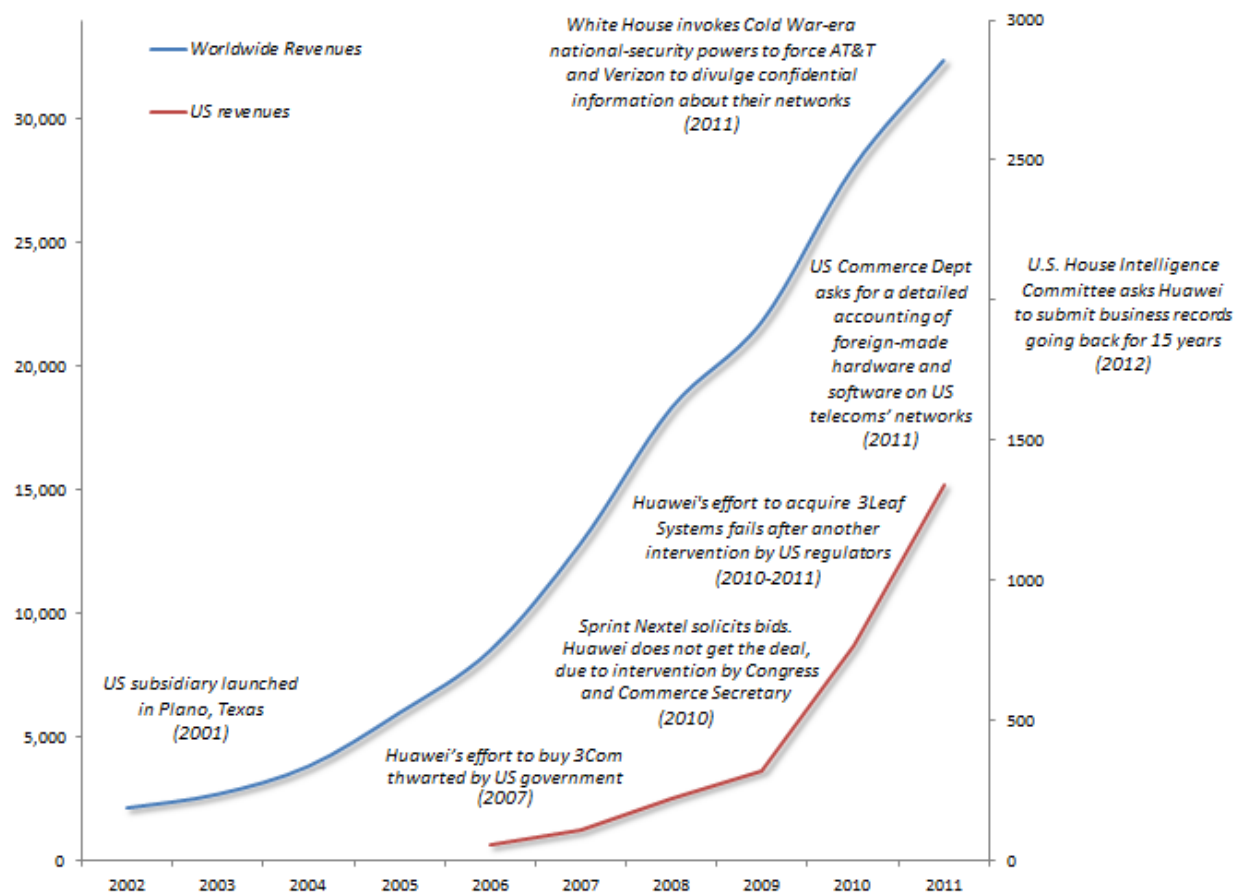
The NCE report does make reference to four specific cases of alleged cyberspace intrusions. However, it does not make reference to any case involving Huawei. Interestingly, the name of Huawei is not even featured in the NCE report.⁹ Still, the company's role was soon invoked by the U.S. House Permanent Select Committee on Intelligence. The committee's chairman, Representative Mike Rogers, a Michigan Republican, cited connections between Huawei's president, Ren Zhengfei, and the People's Liberation Army (in which Ren served a few years three decades ago).¹⁰

In May 2012, the dialogue appeared to move to a new, more cooperative level. Face-to-face meetings took place between U.S. House Intelligence Committee members and executives from Huawei and ZTE in Hong Kong. The panel began a full-fledged probe in November 2011, and committee staff was briefed at Huawei's Shenzhen office in February and by ZTE in April 2012. In June – only weeks after long discussions about these matters – Rogers and the committee's top Democrat, C.A. Ruppberger of Maryland, sent letters to high-ranking officials of both Huawei and ZTE for details about their business dealings as part of an investigation into how their expansion may affect U.S. security (**Figure 1-2**).

The two also asked for details about Huawei's interactions during the past 15 years with five management consulting firms, including IBM, Accenture Plc, and PricewaterhouseCoopers LLP. Additionally, they asked about the company's interactions with Chinese government agencies and officials during the past five years. Additionally, the letter asked Huawei to provide details "for every contract for goods or services provided in the United States."¹¹ Bill Plummer, Huawei's vice president for external affairs, said the company would cooperate in answering the lawmakers' questions and is "committed to continuing to be open and transparent." "It's a great opportunity to once again put the facts on the table," Plummer said.¹²

There is a single systematic common denominator to these allegations. They remain unspecified. The question is why.

Figure 1-2 Years of Frustration



2. THE RISE OF CHINESE MULTINATIONALS

After three decades of economic reforms and opening-up, Chinese economy has begun the long marathon from investment to consumption. At the same time, the direction of foreign direct investment (FDI) flows is shifting. In the past, these flows originated mainly from foreign multinationals operating in China. Until the early 2000s, the momentum was on FDI coming to China from abroad. During the past half a decade, FDI has begun to move from China to foreign markets as well.

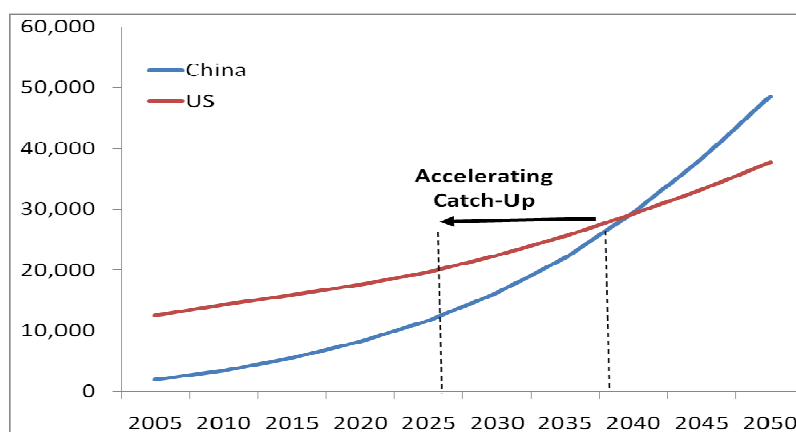
Despite the global crisis, international production by multinational corporations¹³ continues to expand, with sales, employment and assets of foreign affiliates all increasing.¹⁴ Since these emerging challengers originate from a huge home base that continues to have great growth potential but is characterized by relatively low average GDP per capita, their strategies, organizations and processes will not be a replica of the European, American or Japanese multinationals.

China's Reforms

Today, China's development is entering a new stage. As its first-tier cities are moving toward higher productivity and innovation, "old industries" are migrating to second-, third- and fourth-tier cities in the inland and western provinces.¹⁵ In Asia, GDP trend growth has exceeded that of advanced economies over the last three decades, but this is the first time that the contribution of Asia to global recovery has outstripped that of other regions.¹⁶

In 2007 – before the onset of the global crisis – China became the single most important contributor to world growth, in terms of both market and purchasing-power-parity (PPP) exchange rates. In the past, global growth was driven largely by the advanced economies; in the future, it will be driven primarily by the emerging economies. In the first BRIC projections a decade ago, it was suggested that China would take over the U.S. total GDP by 2042. At the time, many thought the projections were too optimistic; in retrospect, these estimates were too conservative.¹⁷ Taken into consideration the growth experience of the 2000s, China is now expected to catch up the U.S. in the late 2020s; if the sustained impact of the global crisis is included (the debt crisis in the G-7 nations), this may occur in the early 2020s (**Figure 2-1**).¹⁸ Although China will enjoy greater economic power relative to the U.S., Chinese average GDP per capita will remain significantly lower relative to the U.S. average.

Starting in the 1980s, China's reform and opening up were initiated by the creation of the coastal special economic zones, especially in Guangdong, close to Hong Kong and Macao, from Beijing – and by the early 1990s – to Shanghai.

Figure 2-1 United States and China: Total GDP, 2005-2050 (\$bn)

Source: Based on author's modeling and updating of Goldman Sachs data (2003-4)¹⁹

As China is transitioning to technological maturity, the new stage of growth is most prevalent in those regions where economic reforms were first initiated, such as Shenzhen in the Guangdong province, Huawei's home base. In 1979, Shenzhen was a poor fishing village with some 20,000 inhabitants. A year later, it became the first destination of China's reforms. Today, it has a population of more than 10 million, and income per capita amounts to \$14,000-\$15,000 – the level of Mexico.²⁰

Shenzhen was seen as a big experiment in China's "Wild West," recalls Ross Gan, Worldwide Head of Huawei's Corporate Communications. "In the mainland, government still ruled many aspects of people's lives. But Shenzhen was more freewheeling. Markets reigned. That's where Huawei grew."²¹

From Advanced-Country Multinationals to Emerging Country Multinationals

Until recently, most major multinational corporations originated from Western Europe, the U.S., or Japan. The British multinationals were at the peak of their power in 1914, when they controlled some 45% of the world's stock of foreign direct investment. In the interwar period, Western European multinationals dominated the world economy. They were shaped by the era, which was typified by significant differences among national markets, high transport and communication barriers, nationalism and protectionism.

In the aftermath of World War II, American multinationals were well-positioned to take advantage of post-war reconstruction, transfer of new technologies, and leverage of management capabilities. Their power peaked in 1967, when they dominated half of the FDI worldwide. Coming from a large and integrated economy, the rise of the U.S. multinationals – from General Electric and Procter & Gamble to ITT – was often driven by internationalization, based on technological and managerial innovations.

Starting in the mid-1960s, Japanese challengers began to capture increasing market share from cars to consumer electronics, across industries in the technology sector. They benefited from two decades of falling trade barriers, improved transport and communications, as well as increasingly similar markets. These companies began to think in terms of creating products for a world market and manufacturing them on a global scale in a few highly efficient plants, often at the corporate center. These multinationals, including their headquarters and often R&D centers, are headquartered in major advanced economies that exhibit similar levels of prosperity, as measured by GDP per capita, and other economic, and social commonalities.

Since 2008, the internationalization of the multinationals continues to accelerate in ways that highlight the role of large emerging economies. This thrust has three drivers. First, the global crisis caused firms to rationalize their corporate structure and increase efficiencies wherever possible (including the options to close down or to sell to others), often by relocating business functions to cost-advantageous locations. Second, the rapid recovery in emerging economies, compared to the relatively weak response in developed economies, has led many multinationals to embrace these markets, in an effort to protect profits and generate growth. And third, the crisis has supported the rise of emerging market multinationals, including state-owned multinationals.²²

In 2010, the market value of the world's largest 500 corporations amounted to more than \$26 trillion. Of this amount, 160 U.S. multinationals accounted for \$9.6 trillion. In relative terms, U.S. multinationals continue to dominate more than a third of the total market value (37%), followed by UK (8%), China (7%), and Japan (5%) (**Figure 2-2**). In turn, the leading advanced economies, as measured by the G7 nations, dominate about two-thirds of the total market value (64%), in contrast to the large emerging economies, as measured by the BRICs nations, whose role is less than a fourth of that (15%).²³

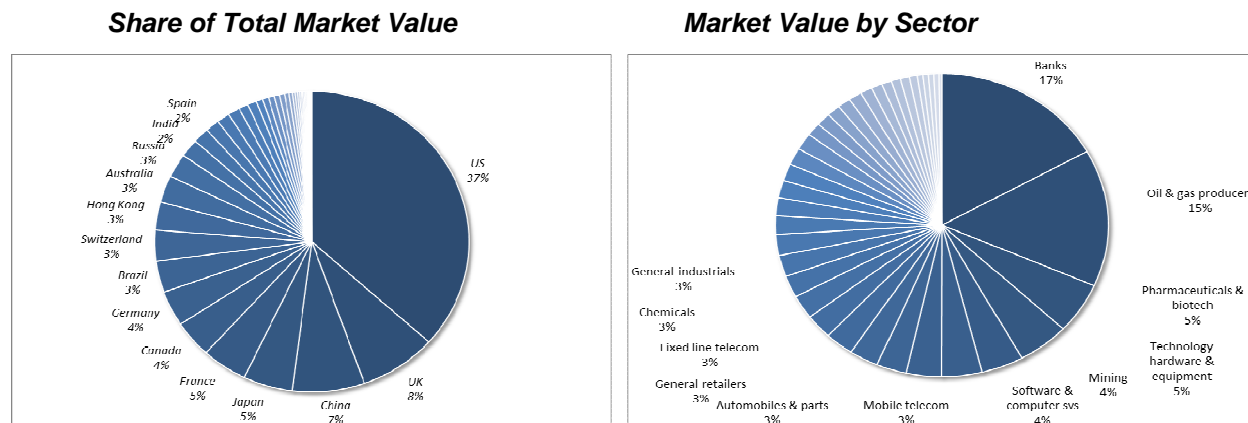
In 2010, the market value of the world's largest emerging 500 corporations amounted to more than \$26 trillion. 94 banks accounted for \$2.3 trillion of the total, followed by oil and gas producers (\$1.6 tr), mining (\$2.2 tr). Together, these accounted for more than half of the total market value. The role of information and communication technology (ICT) – tech hardware and equipment, software and services, mobile telecom and fixed line telecom – was also large (\$0.9 tr), accounting for almost 10% of the total.

Today, an increasing number of multinational corporations originate from emerging economies, particularly from the large emerging economies, including China, India, Brazil, Russia, Mexico, Indonesia and Turkey. These multinationals share a relatively low GDP per capita, but also feature great diversity. In 2010, the market value of the world's emerging 500 corporations amounted to more than \$8.8 trillion. Of this amount, 134 Chinese multinationals accounted for \$2.9 trillion, followed by Brazil (49, \$1.3 tr), India (58, \$0.9), and Russia (29, \$0.9 tr). In relative terms, Chinese multinationals dominate more than a third of the total market value (33%), followed by Brazil (14%), India (10%), and Russia (9%) (**Figure 2-3**).

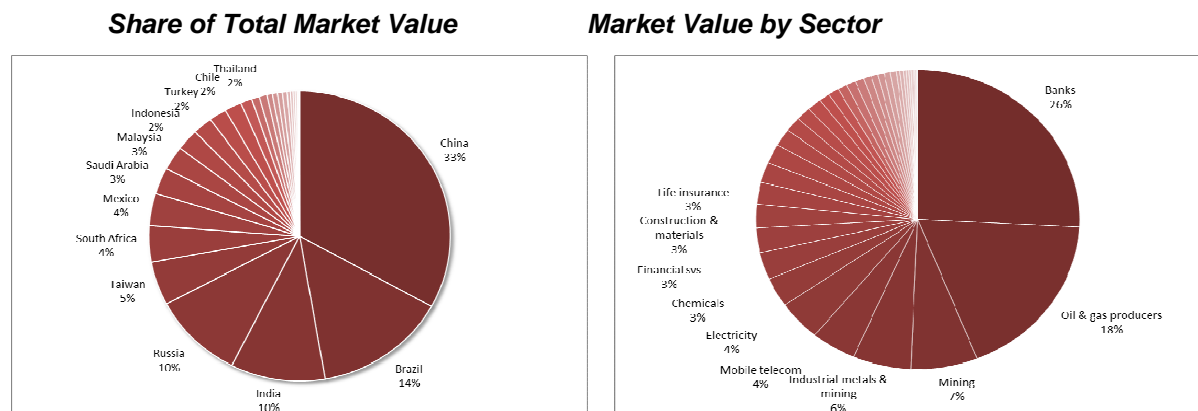
In the early 21st century, it is the large emerging economies that are taking advantage of the technology backlog.

Figure 2-2 Change of Guard

(a) Top-500 Advanced Country Multinationals



(b) Top-500 Emerging-Country Multinationals



Source: Data from Financial Times (2011)

Chinese Multinationals

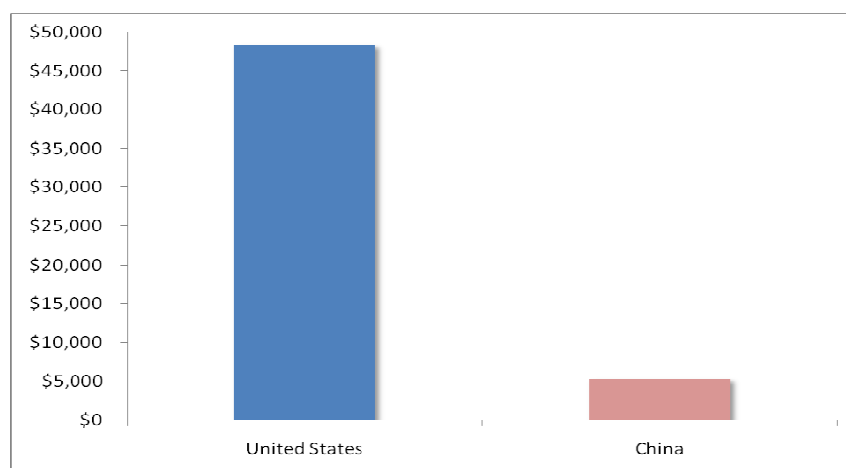
The rise of Chinese companies emerged with China's reforms in the 1980s and 1990s. The drive to internationalize was electrified by China's membership in the World Trade Organization (WTO). However, even today, some 50%-60% of Chinese exports stem from exports by foreign multinational companies operating in China. Unlike the historical multinationals from Europe, the United States, and Japan, aspiring Chinese multinational companies have to cope with competition that is increasingly global, capital-intensive, and innovative. Unlike many of their counterparts, Chinese multinationals came of age in 1980-2008; the boom decades of globalization.

Historically, cost efficiencies have been the most prominent of their advantages. Like other late movers, they begin their growth trajectory by taking advantage of lower labor costs. As they prosper, they pay increasing attention to customer requirements and learn more about quality and differentiation. But these challengers are no longer just about cheap, low-quality imitations flooding world markets; they are also disrupting global competition by breaking established rules of the game, especially through cost innovation; that is, the strategy of using cost advantage in radically new ways to offer customers around the world substantially more for less.²⁴ From Haier to Lenovo and Huawei, the pioneering Chinese multinationals have struggled at home and abroad. Being familiar with severe pricing pressures in their home base, Chinese companies are well-positioned to thrive in merciless cost environments.²⁵

The internationalization of Chinese firms has barely begun, but these firms already own more than 6% of the world FDI. Already prior to the global crisis, the leading 100 emerging multinationals were among the most formidable new competitors on the global stage. Chinese companies account for about a third of these top-100 emerging multinationals worldwide, according to the Boston Consulting Group.

Ultimately, the cost advantage of the emerging Chinese multinationals has to do with the simple fact that U.S. and Western living standards are still almost ten times higher than those in China. It is this fact, coupled with the increasing differentiation and innovation capabilities of Chinese companies that has supported the cost-efficiencies and cost innovation of these companies. Despite China's world-historical growth performance in the past three decades, average prosperity level is \$5,400 in China, as opposed to \$48,400 in the U.S.; about 11.2% of the average U.S. living standard (**Figure 2-4**).²⁶ Chinese companies enjoy cost efficiencies, which remain beyond the reach of those advanced-country multinationals that lack productive capacities in large emerging economies.

Figure 2-4 Differences of Average Living Standards: United States and China



Source: GDP per capita (nominal) IMF (2010-2011)

3. HUAWEI'S GLOBAL SUCCESS

Today, Huawei is China's largest manufacturer of telecom equipment, with offices in more than 140 countries. It may also be one of the most misunderstood companies in the world. In China, it was initially suspicious because it was a first-generation Chinese private-sector leader. In the United States, it has been misperceived as a Chinese state-owned giant. In China, it is a private-sector company that beat the aspiring national champions. Abroad, it has been seen as a threatening public-sector company.

Origins

When Ren Zhengfei founded Huawei, he had a bold dream, as the name of the company suggests.²⁷ But the realities were grim. In 1987, China's electronics industry was decades behind industrialized nations. All Ren had was RMB 21,000 (about \$5,000 at the time) in savings plus funds collected from family members. In China, he is today one of the most charismatic Chinese business leaders, despite a low-profile approach in public relations and media interviews. Books abound about his management style and Huawei's rise, and in business schools the company is a favorite case study. In the U.S.-centric world of American business schools, Huawei's global profile is in no way proportionate to its achievements worldwide. Harvard Business School, the Mecca of company case studies, has currently almost 200 cases, which focus on or feature Cisco Systems, the incumbent leader of Huawei's industry. In contrast, there still is not a single case study of Huawei by HBS faculty.

Huawei originates from a shabby, one-room workshop in Shenzhen, close to Hong Kong, starting off as a sales agent for a Hong Kong company producing private branch exchange (PBX) switches. For the next half a decade, Ren and his colleagues mainly experimented with making stored program-controlled (SPC) switches. Not only was he in the right business; he was in the right place. When the reform period began, Shenzhen's subsistence economy was supported 20,000 poor inhabitants. Today, it is a perhaps the most prosperous megacity in China.

In some sectors, the government continued to have a central role. These industries included telecom carriers, airlines, and oil companies. Infrastructure was a different story. From the beginning, it was open to all kinds of players, and foreign players were invited in "It was a very competitive business," recalls Ross Gan, Worldwide Head of Huawei's Corporate Communications. "Since the penetration was very low, there was a massive demand for infrastructure. The highest relative growth was in the rural areas. Many villages had just one phone." Even though Huawei was still a small player, it soon thrived, especially in the countryside which often had environmentally difficult conditions. "Typically, carriers had many off-spec requirements," Gan adds. "So we

learned to customize very fast. You did R&D on site. Entrepreneurialism and innovation mattered.”

Huawei had no intention to remain just another low-cost player and imitator. By 1990, Ren began the company’s own independent research and commercialization of PBX technologies targeting hotels and small enterprises. As a small player, Huawei could compete neither with the gigantic foreign multinationals nor with the Chinese state-owned national champions. With its C&C08 digital telephone switch, it achieved its first breakthrough into the mainstream telecom market in 1992, by taking advantage of the technology diffusions from Shanghai Bell, the first Sino-foreign joint venture in China.²⁸

Winning Strategy

When asked who has influenced him the most, Ren Zhengfei has said: “Chairman Mao and President Louis Gerstner.”²⁹ If Mao’s strategy guided Ren in China, it was IBM and its former CEO that provided professional support in extending and leveraging that strategy internationally. Ren deployed Mao’s guerrilla war strategy in Huawei’s battles with multinational companies in the telecom business. Inspired by Mao’s ideas of “occupying the countryside first in order to encircle the cities” and the “mass campaign,” he targeted markets in small cities and county towns (*xiancheng*) in the remote provinces, areas to which multinational titans did not bother to seek access.³⁰ Deploying salespeople to win contracts in rural regions before moving into the towns and cities, he called these local managers “guerrilla heads” and gave them autonomy.³¹

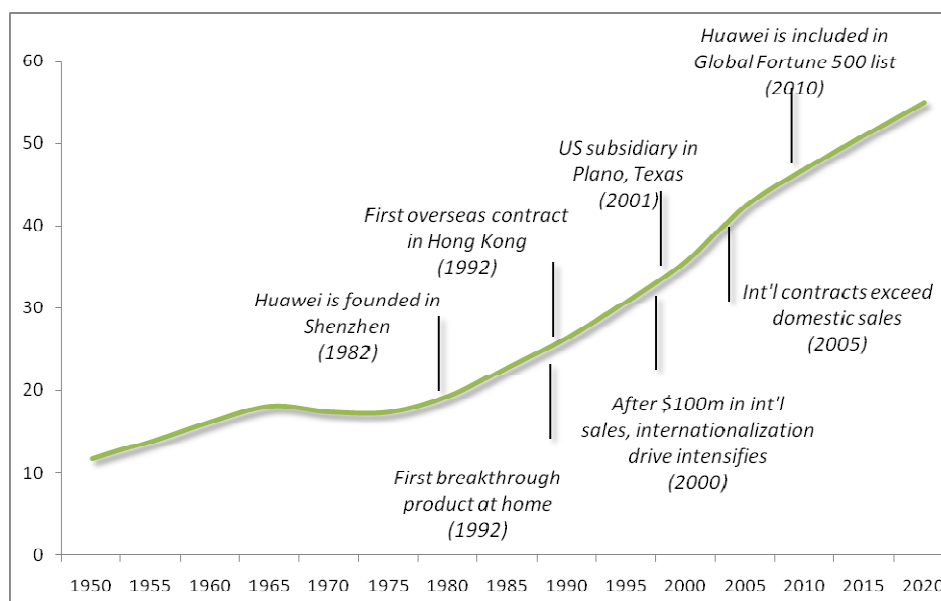
Huawei’s winning strategy in China was closely aligned with the launch and expansion of economic reforms, and the subsequent acceleration of urbanization. When Ren founded his company, China’s rate of urbanization was barely 20%. When Huawei introduced its first breakthrough product in 1992, the rate was still less than 30% (**Figure 3-1**). As two of every three Chinese resided in the countryside and most lived in lower-tiered cities, Ren’s strategy opted for volume at the expense of margin. By 1996, Huawei dominated China’s rural regions and part of urban areas. “It was by 1997 that we had evolved into a significant player in China and could finally bid for major contracts in core cities, such as Beijing and Shanghai,” says Ross Gan. “Huawei had proved itself as a private company.”

In the United States, Huawei’s early success could be compared with a very different company, but one with a similar strategy. In July 1962, Sam Walton’s first Wal-Mart opened in Rogers, Arkansas. Wal-Mart was not the first discount retail chain, but it was the first to grow outside the major cities. Contrary to the prevailing practice, Walton located stores in smaller towns, not larger cities. Like Huawei, Walton hoped to establish a foothold in the countryside to take on the major cities, eventually.

But there were differences as well, and they mattered. When Walton introduced the first Wal-Mart store, urbanization rate in the United States already exceeded 70% – a level

that China is likely to reach only in the 2040s. U.S. GDP per capita was the highest among the major economies. In contrast, when Ren launched his company, the urbanization rate was barely 20% and Chinese GDP per capita was relatively lowest among the developing nations.

Figure 3-1 China's Urbanization Rate and Huawei's Expansion



Extending Strategy Overseas

In the late 1990s, Huawei moved up the value chain in its product and service provision in China, while starting to extend market to overseas, “from developing to developed regions”. Much of Huawei’s overseas success can also be attributed to the company penetrating rural, developing world markets. Initially, it entered under- and un-served markets in Southeast Asia, South Africa and South America that both foreign multinationals and domestic telecoms had neglected. The penetration of more developed markets in advanced economies came later.

By expanding collaboration with Chinese universities, Huawei began competing with foreign multinational companies also in overseas markets. In 1997 – as it had become a major player in China – it won its first overseas contract, providing fixed-line network products to Hong Kong company Hutchison Whampoa.³² In 1999, it opened a R&D center in Bangalore, India to develop a wide range of telecom software.

Looking at the other industries in China launched during the same timeframe as Huawei, Ren thought that heavily protected industries are not inherently competitive and are unable to prosper in the global market, while industries with open competition or less protection develop strong competitiveness and thrive globally. As he put it,

... companies that are favored at home are prone to failure as they cannot stand the storm when they expand outwards. Therefore in the long run, open competition is the best way to inspire development – for nations, for industry sectors, and for individual companies. A company that cannot continuously improve and innovate through fair competition in its home market can hardly be globally competitive.³³

The Role of IBM. After visiting IBM headquarters in 1997, he launched a campaign at Huawei to learn from Louis Gerstner's customer-centric service ideas of IBM. Huawei hoped to continue to maintain its image of producing "low cost and low priced, but high-quality and high-tech products."³⁴ Historically, the customer-centric approach was not something new at Huawei, which grew by "a lot of handholding" and substantial customization in the countryside. But now the idea was to extend the same principle across cities and in emerging and eventually developed markets worldwide.

Management Transformation. To sustain rapid growth, Ren argued that Huawei needed appropriate systems and processes to support that growth. He turned to international consulting companies. In particular, IBM helped Huawei to restructure and reengineer its R&D process. The latter, in turn, was streamlined so that it would be transparent across the company. Ren urged Huawei's employees to become more responsive to customers' needs. Gradually, IBM's lessons were absorbed from supply chain to financial data, in order to better allocate resources. Concurrently, Huawei turned to other consultants, from Ascentia to Boston Consulting Group (BCG). With internationalization, Ren promoted openness to outside advice. He spent weeks traveling in America, interviewing corporate executives in order to find guidance on how to succeed in international markets.³⁵ Huawei sees itself as a "management-intensive" company that wants to be close to the global productivity frontier not just in terms of what it does (products, services), but in terms of how it does things (processes). It allocates 3% of revenues annually for this "management transformation." This is one of the key differentiators between Huawei and other Chinese companies and has paved way to Huawei's success in *developed markets*. "This business is not just about selling boxes," says Gan. "It is about partnerships. These purchases may represent carriers' investments across 20 years. They require high professional familiarity with networks on both sides."

Major Contracts in Europe. In Europe, Huawei secured its first major contract with British Telecom (BT) in 2005. It followed only after a year and a half of very intensive BT audits of Huawei's processes. BT wanted to be sure that Huawei would be thriving not just the next 1-5 years but 10 years from now. Afterwards, other major contracts followed. Between 2005 and 2008, Huawei had achieved contractual relationships with

most major carriers in Europe. “At the end of the day, it was all about investments in hard work and best practices, and management transformation,” says Gan.

Emerging and Developing Markets, and Global R&D. The other aspect of Huawei’s growth was that, toward the end of the 1990s, there was market saturation in China. Digital cellular (2G) networks were pretty much spread out. Meanwhile, the multimedia cellular (3G) revolution had been ignited in Europe. Huawei was developing next-generation networks but could not participate in that evolution in China. As a result, it was forced to go global. In foreign markets, Huawei went out in three major directions. First, there were the emerging markets, which were similar to the rural markets that Huawei had grown to dominate in China. But the company also began to build a foothold in developed markets by launching its first offices in Europe, which at the time was the cutting-edge of the business, had the greatest R&D, the largest carriers (Vodafone) and the leading equipment manufacturers (Ericsson, Nokia). Concurrently, Huawei launched R&D centers in Bangalore (1999), U.S. (2000) and Sweden (2001). The idea was to go where the best talent was.

In retrospect, it all looks like a steep linear line moving upward. In reality, it was a major corporate, professional and personal transition (**Figure 3-2**). Between 1995 and 2000, Huawei’s annual sales rose tenfold to \$2 billion. As the “irrational exuberance” of the dot-com bubble burst, so did the boom years of telecom investment. In early 2001, Ren wrote a commentary in which he warned against complacency in the company. “One will freeze to death without any premonition or preventive measures,” he argued. “When that happens, whoever has a woollen jacket will survive.”³⁶

Figure 3-2 Years of Transition



At the end of the ‘90s, Huawei was expanding rapidly and struggled to integrate new hires. Trying to manage the company amid the burst of the bubble, Ren was working long days.

Along with IBM’s emphasis on quality service, his insistence on worker dedication pushed the work force to its limits. For six months, he had nightmares. And then things got a lot worse.

Only a month before Huawei’s entry into the United States, Ren was on a trip to Iran, when his mother was hit by a car while buying cabbage. A six-hour layover in Bahrain, a storm and a missed connection in Bangkok delayed Ren’s arrival at her bedside, as he acknowledged in a Huawei magazine. By then, his mother was on life support. If only he had phoned her before boarding the plane, perhaps she might have left the house later and survived. He blamed himself.

Huawei's transformation into a global player began amid these headwinds. After 2000, it increased its speed of expansion into overseas markets, having achieved international sales of more than \$100 million. At the same time, it pushed harder for global innovation capabilities, establishing an R&D center in Stockholm, Sweden. In 2001, it established four R&D centers in the U.S. and joined the International Telecommunications Union (ITU). By 2002, Huawei's international market sales had grown more than fivefold, amounting to \$552 million. In 2004 Huawei continued its overseas expansion with a contract to build a 3G network for Telfort, the Dutch mobile operator. Valued at more than \$25 million, this was Huawei's first such contract in Europe. A year later, its international contract orders exceeded domestic sales for the first time.

Global Leader

As Huawei signed a Global Framework Agreement with Vodafone, it became the first telecom equipment supplier from China to receive Approved Supplier status from Vodafone Global Supply Chain.³⁷ It also signed a major infrastructure contract with British Telecom (BT).³⁸ At the same time, it embarked on its first large scale commercial deployment of next-generation technologies.³⁹ In July 2010, Huawei was included in the Global Fortune 500 list for the first time. To adapt to revolutionary changes in the ICT sector, Huawei has coordinated the development of the "cloud-pipe-device" business and put considerable resources towards providing large capacity and intelligent information networks. At the company, the customer comes first, which is reflected even in the company's logo (**Figure 3-3**). Huawei's customer values are seen as deeply rooted in every aspect of its business.⁴⁰

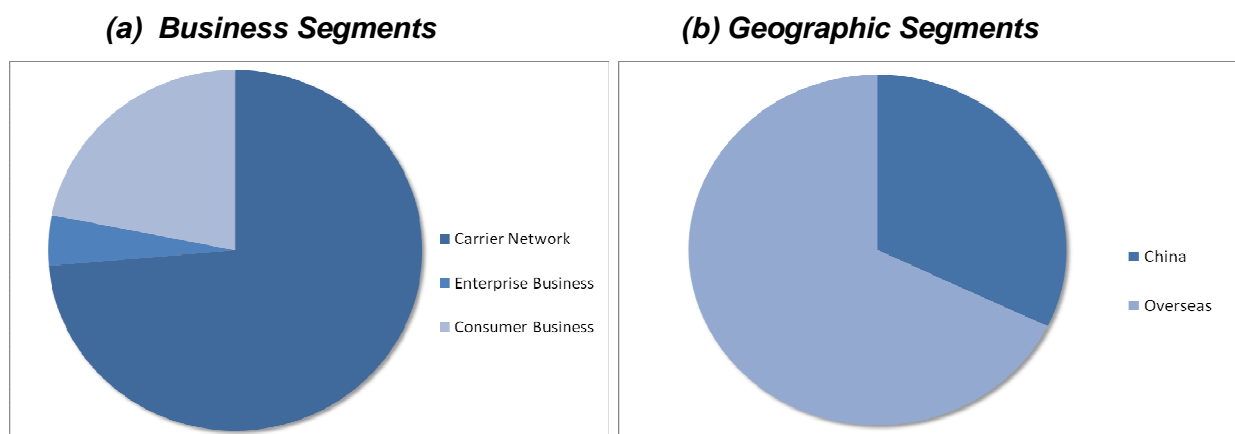
Business Segment Revenues. In 2011, Huawei's presence around the world helped the company achieve healthy growth in the carrier network, enterprise, and consumer businesses. Annual sales revenue amounted to more than RMB 203.9 billion, an 11.7% increase over the previous year. Of these three segments, the enterprise business grew relatively fastest (57.1%), along with consumer business (44.3%), whereas the business of carrier networks is maturing (3.0%) (**Figure 3-4a**).

Geographic Segment Revenues. Huawei's Western counterparts tend to rely on their large home base and markets in the United States and the UK. In contrast, Huawei does not enjoy the privilege of preferential access at home, which forced it to become more global than its major peers in China and elsewhere. It obtains almost 70% of its geographic revenues from international markets. In the Chinese market, Huawei's sales revenue amounted to \$10.3 billion (RMB 65.6 billion), an increase of 5.5% year-on-year (**Figure 3-4b**, see also **Appendix**).⁴¹ In the past, the share of international markets was even higher, but the current debt crises in the West coupled with the rapid 3G expansion in China have stabilized the ratio. In the long run, however, Huawei executives expect the international share to climb again. For instance, in Europe their market share may be around 10%. "It's still the early days for us," say the executives.

Figure 3-3 Huawei's Logo



Figure 3-4 Huawei's Revenues, 2011



Source: Huawei.

Despite Huawei's success, it remains at spotlight in the West. Most recently, the Economist released a cover story on "the company that spooked the world," arguing that "the success of China's telecoms-equipment behemoth makes spies and politicians elsewhere nervous."⁴² In reality, such concerns have arisen in only a few countries, in addition to the United States. The cover story was coupled by a lead on Chinese multinationals, which reminded the readers that "techno-nationalism is not the answer" to the success of Chinese multinationals, such as Huawei.⁴³

4. CORPORATE GOVERNANCE

In the United States, Huawei's corporate governance structure and the role of its CEO has sparked questions regarding the ownership and control of the company. In both cases, misunderstandings overshadow better understanding of company's goals.

Ownership and Control

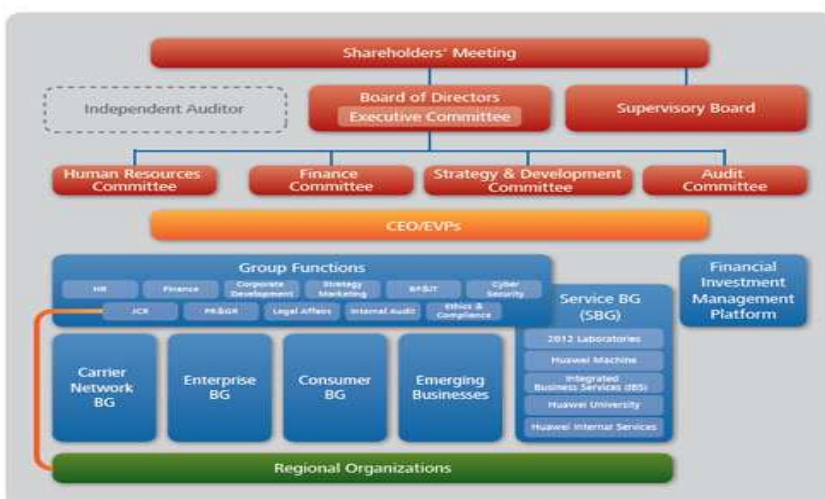
Huawei evolved in an era which was characterized by government-owned, military-linked, heavily subsidized companies, such as Great Dragon, which created China's first digital central office switch in the late 1990s. Typically, national champions start with great dreams, until those dreams crash in the marketplace. Today, Great Dragon is history, whereas Huawei is making history. A significant part of this success can be attributed to its ability to retain most talented human capital. In this accomplishment, rewards and incentives play a vital role.

Since 1990, Huawei has rewarded its staff with the right to buy Huawei stock, also entitling them to an annual dividend. A decade ago, the system was formalized into a restricted or virtual stock arrangement. Huawei – or more formally, Huawei Investment & Holding Co., Ltd. – is a private company wholly owned by its employees. Through the Union, the company implements an Employee Shareholding Scheme. As of year-end 2011, the latter involved some 65,600 employees. They are represented by elected representatives. The Scheme aligns employee contributions with the company's long-term development, seeking to foster Huawei's continued success.⁴⁴ Huawei's Board of Directors and Committees (BOD) is the decision-making body for corporate strategy and management.⁴⁵ Pursuant to the requirements of the Chinese Company Law, Huawei has established a Supervisory Board (**Figure 4-1**).⁴⁶

Due to prevailing Chinese legal practices, overseas employees cannot own shares. Employees must return their allocated shares when they leave Huawei and the shares are bought back by the company at their current value.⁴⁷ Customer-centric innovation, or what Gan calls the “shared destiny” of the company and its employees is a “very strong motivating factor. It's all about risks and rewards.”

As a global corporation, Huawei emphasizes the principle of localization; that is, using local work force in host countries. Indeed, almost half of its employees are now non-Chinese, although only Chinese employees can be allocated these shares. As far as Huawei is concerned, the stock ownership plan helps it to attract and retain talent and keeps employee benefits in line with company performance. This is no minor consideration in China – or in other large emerging economies – where companies have great turnover of employees and many simply do not have the kind of capital resources that would allow them to respond to foreign multinationals' lucrative employee schemes.

Figure 4-1 Huawei's Corporate Governance Structure



Source: 2011 Annual Report, Huawei Investment & Holding Co., Ltd., p. 69.

President Ren Zhengfei owns only 1.42% of shares in Huawei. The rest - some 98.6% - is owned by employees, according to the company. Huawei employees seem to be content with the setup, especially as the dividends often add significantly to salary. Critics argue that Huawei's ownership arrangements are not adequately transparent.⁴⁸ For its part, the company has become more transparent with globalization. In 2011, Huawei published a list and biographies of the executives who run the company. The most recent annual report disclosed names of its board of directors, for the first time.⁴⁹

The leadership succession at Huawei is a matter of great speculation in Chinese and international news media, particularly after Ren acknowledged he had been treated for cancer twice in the previous eight years.⁵⁰ In April 2012, Huawei announced that Ren was splitting the role of chief executive officer with a panel of three executives - current CEO Xu Zhijun (who uses the English name Eric), Deputy Chairmen Guo Ping, and Hu Houkun (who uses the name Ken) - who will rotate at six-month intervals.⁵¹ In turn, Ren retained his title as a deputy chairman of Huawei.⁵² After the rotational period is over, the non-acting rotating CEOs are still part of the company's "decision-making nucleus."

In one way or another, the concern over Huawei as a kind of corporate Trojan horse for the Chinese People's Liberation Army (PLA) goes back to an influential 2005 study by the RAND - a nonprofit policy think tank first formed to offer research and analysis to the U.S. armed forces - on the "Chinese military-industrial complex." Along with a group of other Chinese IT companies, Huawei was identified as part of the "digital triangle" of commercial domestic IT companies, state R&D institutes, and the military.⁵³ However, the contractual relationship does not make Huawei any different from major Nordic and U.S. equipment vendors which, in their early years, benefited from defense contractors. In the U.S., Motorola's way to industry leader was paved with defense contracts in World War II and during the Cold War, while Qualcomm's CDMA development followed

in the same footprints. Like Paul Galvin's Motorola in the United States after World War II, or Irwin Jacobs' Qualcomm in Silicon Valley, the most advanced electronics organizations were initially closely related to national defense, either directly or indirectly through research contracts.⁵⁴

The relationship between Huawei and the PLA, along with other Chinese telecom companies, has also been explained in terms of Huawei's ties with a group of government research institutes,⁵⁵ some of which were sponsored by the PLA.⁵⁶ But as mentioned, much of the contemporary ICT sector originated historically from defense-related R&D, first in the U.S. and Western Europe, later elsewhere. As R&D projects have been decoupled from defense objectives, they have become commercially more competitive and profitable. It was precisely for this reason that Huawei and several IT companies were awarded new "national laboratories" in 2007, by the Ministry of Science and Technology. These advancements reflect shifts toward greater research efficiencies among Chinese research institutes.

The Role of Ren Zhengfei

Ren Zhengfei is the president of Huawei and has held the title since 1988. More than anywhere else, the CEO of Huawei has been on the spotlight in the U.S., due to his past role in the People's Liberation Army and the Chinese Communist Party.⁵⁷

Ren was born October 25, 1944, in a remote mountainous town in Guizhou Province, where his schoolteacher parents often had to borrow money to make ends meet. "Until high school," he wrote later in the Huawei magazine, "I never owned a proper shirt." What made Ren's position *really* atypical has not really been understood in the West. Reportedly, his family did not have historical ties with the CCP, but with the Chinese nationalist Party Kuomintang.

After the creation of the Chinese republic in 1911, the nation was divided between the Communists and the nationalists, which both fought the colonial powers, received training in the Soviet Union, and struggled against Japanese invasion. Eventually, the two fought each other in the Civil War, which ended with the founding of the People's Republic of China in 1949, when the nationalists fled to Taiwan. Like other Chinese families, Ren's family was swept by these historical forces. His grandfather, a master chef, was from Jiangsu province, which borders Zhejiang and Shanghai to the south. Ren's father could not complete university studies because his grandfather died a year prior to his graduation. During the Japanese occupation, his father migrated to Guangzhou (Canton) in Southern China to work in the Kuomintang arms factory as an accounts clerk. After Mao declared the People's Republic in 1949, his father was appointed the president of No.1 Middle School of Duyun where he met Ren's mother, the eldest of seven children and a senior teacher. Due to his parents' social background and their ties to the Kuomintang, Ren was excluded from joining the Communist Party for most of his career in the military. He studied at Chongqing Institute of Civil

Engineering and Architecture, where he graduated in 1963. He was employed in civil engineering until the early 1970s, when China went through the turmoil of the Cultural Revolution, which ended with Mao's death and the rise of the pragmatic reformers, such as Deng Xiaoping. It was then – in 1974 – that the People's Liberation Army, strapped for engineers, overlooked Ren's background and put him in the Engineering Corps., as a soldier tasked with building the then French-imported Liao Yang Chemical Fiber Factory.⁵⁸

Because of outstanding performance, Ren rose to deputy director and was invited in 1978 to the National Science Conference and in 1982 to the National Congress of the Communist Party. When the relations with the U.S. were normalized under the Carter administration, China entered the era of economic reforms and opening-up. Ren's army career ended with Deng Xiaoping's cutbacks. In 1982, he retired from the army due to a large PLA force reduction which impacted 500,000 active duty personnel. In turn, the assertion that Huawei has links with the PLA seems to be based on a case of mistaken identity.⁵⁹

After Ren became dissatisfied with his job at the logistics service base of the Shenzhen South Sea Oil Corporation, he established Huawei in 1987. As a representative of private entrepreneurs, he was elected member of the 12th National Congress. Among other accomplishments, he has been responsible for developing cooperative programs with businesses in China's interior regions. At the time, the effectiveness of the private entrepreneurs within the party was still minimal. Things began to change only in the 16th Party Congress in 2002, when Jian Zemin's theory of "Three Represents" became a guiding ideology of the Party and the goal became to open up the Party to "the overwhelming majority of the Chinese people", including executives and managers.⁶⁰

Ren belongs to the generation of Chinese business leaders who share a high regard and respect for American business and its titans and who are dedicated to increasing understanding and trust between the two nations. Understandably, Huawei's treatment in the U.S. has been difficult for him to comprehend. Reportedly, some four years ago, he visited the U.S. consulate in Guangzhou, China, to complain that he had been issued only a single-entry visa. He was exasperated at U.S. suspicions that his company was close to the Chinese military and government. He pointed out that his parents had been sent to labor camps during the Cultural Revolution and the only reason he had been allowed into the Chinese Army was that the army was short of skilled technicians.⁶¹

Ren's career as a military engineer in the PLA lasted about five years. It ended some three decades ago. Nonetheless, Huawei and Ren have been repeatedly charged of links to PLA and the Chinese Communist Party.

5. CREDIT CONTROVERSIES

In the 1970s and 1980s, Japanese car producers were accused for a wide array of anti-competitive gains in the United States. The assumption was that these companies *could* not be as successful as or even better than American companies. The assumption proved flawed. Today, Huawei is challenged for alleged financial support from the Chinese government. Now, the assumption is that since Chinese companies cannot be more successful than their Western counterparts, they must enjoy some kind of hidden advantages. It is not cost efficiencies, differentiation or innovation capabilities that account for Huawei's success, but Chinese banks – or so the argument goes.

From Early Years to the Euro Debt Crisis

Seen in a historical perspective, the claim is curious. In the first two decades of the reform era, the Chinese homegrown companies were still marginal players in the competition for a share of the country's telecom equipment market. "How could it be possible for a small Chinese firm with a total of 21,000 yuan [about \$5,000 at the time] and 14 employees to compete with multinational telecom giants?" Huawei's President Ren likes to ask to remind the employees of the company's humble beginnings. At the time, the last thing he enjoyed was a preferential treatment by the Chinese banks.

In the early years, the Chinese government did have preferential policies, but these favored foreign multinationals, not Chinese companies. Typically, they put homegrown telecom equipment manufacturers such as Huawei at a disadvantage. "Huawei had no capital, no technology, no 'identity'," Ren recalls. Huawei was not a state-owned enterprise (SOE), which could rely on the support of the Chinese government.⁶² Nor could Ren get much support from local banks. Rather, he had to borrow from large enterprises with a very high interest rate (20–30%).⁶³

Today, the emergence of Huawei, along with other Chinese multinationals, has happened so fast that some industry analysts have suspected "unsustainably low prices and government export assistance" as key to the company's rapid expansion.⁶⁴

Typically, the allegations of Chinese state subsidies to Huawei first surfaced in summer 2010; only a month or two after the onset of the Eurozone debt crisis. The controversy evolved with workers' unions and Option SA, a Belgian manufacturer of wireless wide-area network (WWAN) modems,⁶⁵ which complained that Chinese government assistance to Huawei and ZTE allowed the Chinese companies to compete with an unfair pricing advantage.⁶⁶

Credit Lines to Huawei's Customers

Huawei says it operates like any other private corporation and that it is financed through capital from its shareholders and through normal commercial loans. As Huawei's executives like to add, since it is headquartered in the Shenzhen Special Economic Zone (SEZ), it has grown within the world of the market economy, from the beginning.

Like many other companies that operate in China, Huawei receives tax incentives provided by the Chinese government to high-tech enterprises and support for some of its R&D initiatives. They compare this to tax incentives offered by the U.S. government agencies to U.S. companies. In 2010, Huawei received a total of RMB 593 million (\$89.8 million) of financial support from the Chinese government for its R&D activities.⁶⁷

The role of the Chinese commercial banks is more indirect. The credit lines made available through Huawei by the banks are designated for Huawei's customers.⁶⁸ In 2004, the CDB agreed to offer a \$10 billion buyer's credit line to its customers and the amount was subsequently increased to \$30 billion in 2009. By mid-2011, some \$10 billion had been loaned to Huawei's customers from the CDB.⁶⁹

Controversy over Export Credit Financing

Due to the lingering impact of the global crisis, stagnation and election cycles, pressure has been mounting in the United States and Europe to take measures to avoid being shut out of contracts and markets as a result of outsized exports credits and subsidies. In its *2010 Competitive Report*, the Export-Import Bank of the U.S. warned "the Chinese export team [is] a \$40–50 billion-a-year behemoth that is regularly competing with the OECD/G-7 exporters in third markets."⁷⁰ In a June 15, 2011 speech, the bank's CEO and chairman Fred Hochberg took direct aim at Huawei and Chinese export subsidies.⁷¹ That, in turn, resulted in other warnings by members of Congress.⁷² Huawei called these allegations tired, while, again, providing more information about the credit lines in letters to select U.S. officials.

A total credit of \$40 billion had been made available to Huawei customers through memoranda of understanding with the China Development Bank, but these customers have only tapped \$2.9 billion from this credit pool since 2005. Huawei stated that "\$10 billion had been loaned to our customers from the China Development Bank." It also listed the total available for credits lines as \$30 billion.⁷³ While the U.S. and the EU are expected to take unilateral countervailing duty actions against Huawei (and ZTE), China is preparing a tit-for-tat campaign.⁷⁴

In summer 2011, Hochberg had asserted that "none of the G-7 countries provide levels of financing anywhere near those of the Chinese Development Bank."⁷⁵ However, the matter of export credit financing comprises all economies, including the advanced economies, as suggested by the most recent *2011 Competitiveness Report*.⁷⁶

6. HUAWEI'S EXPANSION EFFORTS IN AMERICA

In 2010, Chinese investment in the U.S. amounted to over \$5 billion, which translates to more than 10,000 jobs. After a temporary slowdown in the second half of 2011, Chinese FDI in the U.S. picked up, totaling \$3.6 billion in the first half of 2012. This set the stage for a record-breaking year with the potential to significantly outpace the high of \$5.7 billion recorded in 2010. Assuming that China's FDI emulates the pattern of other large emerging economies, Chinese FDI is expected to exceed \$1 trillion worldwide by 2020.⁷⁷ In fiscal 2011, Huawei increased its business investments and recruited nearly 30,000 additional employees. Today, the company has some 140,000 employees. During the past few years, Huawei's increased presence and M&A efforts in the United States have been rebuffed by the U.S. government, time and time again. The case is unique in U.S. corporate history and reflects unprecedented anti-market intervention – as well as missed job-creation opportunities and capital investment in America.

Huawei USA

Huawei launched its North American headquarters in Plano, Texas on Valentine's Day in 2001. That's when a small group of Huawei employees led by Charlie Chen, a senior VP, established the company's first U.S. office.⁷⁸ Three years later Huawei President Ren visited Texas to check on his emissaries. Huawei had yet to sign up a single U.S. customer, says Chen, and almost no one could pronounce its name. It had registered in the U.S. as "Futurewei" to make things easier, but that only caused further confusion.

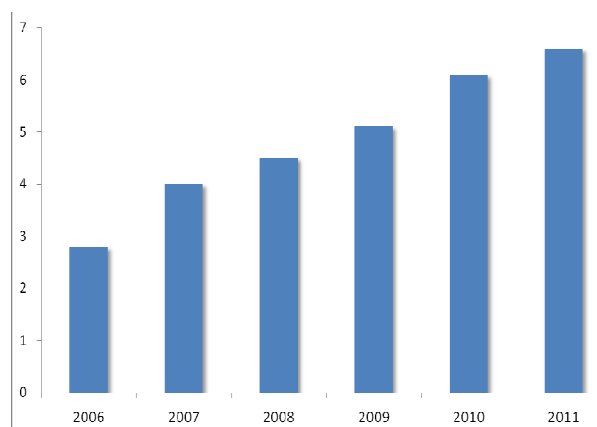
Today, Huawei has 12 regional offices in the U.S. It maintains seven advanced R&D centers developing the next-generation of ICT technologies, including the flagship R&D facility in Santa Clara, California. It has the infrastructure to be a major US telecom player (**Figure 6-1a**). It employs nearly 1,800 professionals and support staff across its U.S. facilities, representing a tenfold growth in its U.S. operations since 2006. About 75% of them are Americans. Unlike many Western companies, not only is most of its work force localized in foreign markets, so are its executives, particularly in the U.S. To nurture relationships with carriers and develop products for the market, it has hired a slate of executives from advanced-country multinationals, such as Cisco, Ericsson, Intel, Nokia, Nortel, and Sun. Huawei relies on world-class companies in the U.S. to supply it with software, products, components, chipsets and services. Since 2006, it has purchased \$30 billion from major U.S. technology companies, including ADI, Broadcom, Dell, Freescale, Hewlett-Packard, IBM, Microsoft, Oracle, Qualcomm and Texas Instruments (**Figure 6-1b**).

Figure 6-1 Huawei in North America

(a) Huawei's Facilities, ca 2012



(b) Purchases from US Suppliers*



* 2006-2011

Source: Huawei

Frustrated Expansion Efforts

Huawei has focused on expanding its mobile technology and networking solutions through a number of partnerships.⁷⁹ In the U.S., however, it has faced resistance against its proposed M&As that goes far beyond pure competition with its peers.

- In March 2003, Huawei and 3Com Corporation formed a joint venture company, 3Com-Huawei (H3C), which focused on the R&D, production and sales of data networking products. The company later divested a 49% stake in H3C for \$880 million in 2006.
- In 2007, Huawei's effort to buy 3Com was thwarted by the U.S. government.
- Huawei and U.S. security firm Symantec announced in May 2007 the formation of a joint-venture company based in Chengdu, to develop security and storage solutions to market to telecom carriers.
- Huawei sought to acquire a defunct California cloud-computing company called 3Leaf Systems in May 2010 for \$2 million. In early 2011, U.S. regulators forced it to unravel the purchase.
- In fall 2010, Sprint Nextel solicited bids for a network upgrade, which might have gone to Huawei had it not been another intervention by the Congress and even Commerce Secretary.

- In spring 2012, Huawei-Symantec, the joint venture between Huawei and Symantec, stopped trading and left the United States, following the U.S. government's blockade of several acquisitions.

Let's take a closer look at two cases: Sprint and 3Leaf. While the first illustrates the stakes in Huawei's efforts to make deals with major U.S. telecom operators, the latter indicates how far the company is willing to go to eliminate suspicions by the U.S. government.

- **The Sprint Case.** In fall 2010, Sprint Nextel solicited bids for a network upgrade. Reportedly, Huawei offered a deal that would have saved the carrier \$800 million from its existing costs in the first year of operation alone. Members of Congress, led by Senator Jon Kyl, Republican from Arizona, launched a letter-writing campaign urging Sprint not to include Huawei. In turn, Commerce Secretary Locke called CEO Dan Hesse to convey his "very deep concerns" about national security. The \$5 billion prize was split among Ericsson, Alcatel-Lucent, and Samsung.⁸⁰ To work on its image in Washington, Huawei engaged the lobbying firm of former Defense Secretary William Cohen. To boost its chances, Huawei had formed a partnership with Amerilink Telecom, headed by the former vice chairman of the Joint Chiefs of Staff, Adm. Bill Owens, former CEO of Nortel Networks.⁸¹ But even that did not help.
- **The 3Leaf Case.** Futurewei, Huawei's U.S. subsidiary, purchased certain assets from 3Leaf located in Santa Clara, California, in May and July 2010, when 3Leaf was ceasing its operations and no other buyers for its intellectual property were forthcoming. Huawei submitted a request to the Bureau of Industry and Security at the Department of Commerce in advance of completing the purchase in May, while the Department of Commerce certified that no license was required to export the 3Leaf technology. After learning that the Committee on Foreign Investment in the United States (CFIUS) was interested in the 3Leaf transaction, Huawei submitted the draft and formal voluntary filings to initiate a CFIUS review of the transaction in November 2010. On February 11, 2011, CFIUS formally recommended that Huawei withdraw its notice under terms dictated by CFIUS.⁸² The decision was followed by an open letter of Huawei Chairman USA Ken Hu. The U.S. government had actively intervened with market forces with unspecified allegations, he said urging the U.S. government to "carry out a formal investigation on any concerns it may have about Huawei."⁸³

Huawei's current North American customers include Bell Canada, Cleartalk, Clearwire, Cox Communications, Hibernia, Leap Wireless, MetroPC, Sasktel, Suddenlink, TELUS, T-Mobile and XO Communications. Despite U.S. government's blockades, the company remains eager to win customers like AT&T, Verizon and Sprint. Meanwhile, it has been

able to sell to mid-tier telecoms, from core infrastructure to consumer devices. Last year, these customers included Leap, a spin-off from Qualcomm, whose Cricket was the seventh-largest U.S. wireless operator.⁸⁴ Best Buy sells a seven-inch Android-based tablet from Huawei called the IDEOS S7, which at under \$300 is aimed at value-conscious consumers. These large customers also include Internet wireless provider Clearwire, which is majority-owned by Sprint and has a partnership deal to carry Sprint's 4G traffic on Huawei's equipment. The list also comprises Level3 Communications, which operates secure-channel communications for over 200 government agencies, is a U.S. defense contractor, and forms the backbone of the Internet, an IP transit network across the U.S. and Western Europe.⁸⁵

Through these customers, Huawei already has substantial presence in the U.S. critical information infrastructure. As a result, even for informed observers it is difficult to comprehend why the company has been blocked from some deals but not from others. Such inconsistencies do not support the U.S. government's case. The same goes for America's core allies across the Atlantic. In Europe, Huawei has a team that's almost twice as large as in the U.S. and most have been recruited locally. It has worked successfully with Europe's leading operators (see **Appendix**).

Contributing to the Silicon Prairie Rejuvenation

Within easy reach of Dallas-Fort Worth airport, and the technology centers of Dallas and Fort Worth, Huawei's North American headquarters are centrally located off President George Bush Highway in North Texas. "When you visit our headquarters in Plano, Texas, it is like the old-style North Texas Telecom Corridor déjà vu," says William Plummer, Huawei's vice president for external affairs. "Unlike Santa Clara, it's more like the United Nations of information and communication technology (ICT) getting together in a concentrated geographic area, which allows further cross-pollination of ideas, people, investment, and technologies."

Although the Telecom Corridor was a booming area of Dallas's economy during the late 1990s, the dot-com bust of 2001 hit the region hard. It began recovering in 2004.⁸⁶ The Corridor is a technology business center in Richardson, Texas, which accounted for over 82,600 jobs before the global crisis.⁸⁷ Located in the the Northern suburb of Dallas/Fort Worth area, the Corridor is a strip about 6.5 miles along U.S. Highway 75. The Silicon Prairie has served hundreds of technology companies, including major players such as AT&T, Ericsson, Verizon, Samsung, Texas Instruments and MetroPCS.

Along with the Shenzhen-like climate, entrepreneurialism and innovation clusters, the history of the Telecom Corridor, particularly the past role of Ericsson, Samsung, Nokia and other telecom giants, motivated Huawei's entry as well. Unlike most industry incumbents, it arrived when others were scaling down their operations. For its part, it has contributed to the rejuvenation of the Silicon Prairie. At Huawei, operations

management, sales and marketing, customer service, technical support, training, and product development are centralized in a building adjacent to the Corridor.⁸⁸

Corporate Citizen

As Huawei's business grows, it is committed to making even greater contributions to the U.S. economy and society as a whole. Its commitment to helping communities in need and being a good corporate citizen are top priorities for the company. Its most recent initiatives in the U.S. include more than \$30,000 to support STEM (Science, Technology, engineering and Math) Education in schools; over \$100,000 to national charities that support the health, education and success of children; \$150,000 for general community support, including museums, hospitals and food banks; employee volunteer activities to benefit Communities in Schools, Boys and Girls Clubs of America, Habitat for Humanity and local food banks.

Corporate philanthropy is held in high regard among the leading Chinese multinationals. Many of the founders of these companies grew their early years only a stone's throw away from abject poverty. In this regard, the World Economic Forum (WEF) regards Huawei as exemplary among emerging Chinese multinationals. In 2010, Huawei donated more than \$1 million in cash and materials to Venezuela, Colombia, Mexico and Vietnam, which all suffered from severe flood disasters.⁸⁹

Today, Chinese companies are also industry leaders in many segments of the clean technology sector. ZTE, Huawei and China Mobile installed various solar and wind power base stations in developing markets, reducing maintenance costs and energy consumption while providing telecom service to rural areas. Chinese multinationals pay particular attention to environmental aspects in supply chain management, given the increasing complexity and interdependence of supplier networks. In the case of Huawei, these capabilities evolved from the pressure of its European clients.⁹⁰

7. COMPETITIVENESS

What makes Huawei a tough competitor is the kind of competitiveness it represents and that most advanced-country multinationals find difficult to replicate. As it has climbed higher in the value-added chain, Huawei has become a key global player in the build out of advanced 3G and 4G wireless equipment networks. At the same time, it is moving toward enterprise markets and the rapidly expanding smart-phone market. Huawei's plans call for moving into cloud computing and the enterprise space, bringing it into competition with the likes of Oracle, Avaya, Hewlett-Packard, Cisco, and Amazon. Worldwide, Huawei forecasts its revenue will triple by 2020, to more than \$100 billion.

It is this competitiveness effect that serves as a major incentive for the incumbent leaders to deter Huawei's expansion in the U.S.

Competitiveness Effect

In July 2012, Huawei's revenues outstripped those of the Swedish Ericsson, for some time the world's largest supplier of telecoms equipment; Huawei generated some \$16 billion in the first half of 2012, in comparison to Ericsson's \$15.5 billion. True, Ericsson remains the largest supplier of network infrastructure, but it is under increasing pressure to respond to the Chinese challenger.

In addition to its differentiation and innovation, Huawei continues to exert a major impact on price competition in the markets in which it competes. Before Huawei began bidding for large European telecom-equipment contracts in 2004, gross profit margins for major players such as Ericsson and Alcatel-Lucent amounted to 45%–50%. As Huawei joined the rivalries, those profit margins plunged to 30%–35%. However, these competitive characteristics are typical to many emerging Chinese multinationals (see Chapter 2).

While U.S. operators do an estimated 15% of the global spending on telecom equipment, they account for up to 25% of the profit. Gross margins for equipment vendors in the U.S. are 45%-50%. Huawei's new technology makes it an even more formidable competitor because it can create significant cost savings for customers.⁹¹

As Huawei's efforts to expand in the U.S. have increased, so have the comments by Cisco's senior executives on Huawei's alleged "unfair competition." In May 2012, Cisco's CEO John Chambers identified Huawei as its toughest rival, stating that the Chinese company doesn't always "play by the rules" in areas such as intellectual property protection and computer security.⁹²

The simple reality is that such dealings are not that uncommon in the telecom world. According to *Wired* magazine, equipment sold by HP, Cisco, and Sun Microsystems — now part of Oracle — has turned up inside Iran's second largest mobile-phone

operator.⁹³ Moreover, U.S. telecoms-equipment makers have historically enjoyed cozy relations with America's national-security complex. The former head of the National Security Agency, America's GCHQ, sits on the board of Motorola Solutions, a major telecoms-equipment provider. In the past, U.S. officials have demanded the installation of "back doors" in some exports, through which the devices can be accessed on the quiet. In July, evidence was presented at DefCon, a big hackers' convention held, of security vulnerabilities in a couple of Huawei's smaller routers. However, such flaws are common in the industry. Several years ago, the U.S. government gave warning of similar vulnerabilities found in kit made by Cisco and other Western firms.⁹⁴

While arguments based on "unfair competition" may work on Capitol Hill, they are not credible to industry analysts. In summer 2011, Cisco implemented huge labor cuts to boost its bottom line.⁹⁵ Even as he was challenging Huawei's integrity, Chambers explained the free fall of Cisco's stock on the basis of fears of Europe. In contrast, industry analysts believe enterprises do not want to buy network gear anymore, but prefer to put applications into the cloud and move their spending from CAPEX (big capital equipment) to OPEX (monthly payments on operations). "There's a fundamental transformation happening and it's upsetting the old guard," says a former Cisco executive.⁹⁶ If Huawei can enter the U.S. marketplace, incumbent industry leaders fear for *their* margins. "Make no mistake: We are not good news to the incumbents," says John Roesse, Huawei's R&D chief in North America. "We take a close look at the industry. We look at the customer's interest. If margins do not reflect it, too bad."⁹⁷

Rise in Smartphones

Between April and June 2012, China saw phenomenal 199 percent year-on-year growth. China accounted for 27 percent of the 158 million global smart phone shipments, compared to 16 percent for the United States. Samsung was struggling to maintain its overall leadership position in China with a 17% market share, while several local vendors – in particular, ZTE, Lenovo and Huawei – were closing the gap.⁹⁸ By summer 2012, Apple's failure to globalize its U.S. triumph and Samsung's quest to sustain its global leadership were both in question. In the second quarter, Huawei, for the first time, passed Nokia to become the third-largest smartphone maker, according to equity research firm Asymco.

With its low-cost approach, the company has gained traction in China, the Middle East and Africa, often with unbranded models. It got serious about smartphones in 2009. Unlike Apple, Microsoft, Nokia or RIM, Huawei did not try to build its own software operating system. Unlike Samsung, HTC or Motorola, it did not try to differentiate Google's mobile software. By deploying Android, it took advantage of its strengths in global efficiencies, hardware and scale. In 2012, Huawei plans to triple its smartphone sales to 60 million units globally, up from 20 million last year and 3 million in 2010, in part by taking a bigger chunk of the U.S. market.⁹⁹

In the near future, analysts expect Huawei to challenge Samsung in smartphone sales. As smartphones has evolved from business markets and novelty technology into an affordable global consumer gadget, Huawei is well positioned to benefit. In the 1990s, Nokia made the digital cellular handset market for affordable smartphones. In the 2010s, Huawei is doing the same in the global smartphone marketplace – not least because of its strengths as a trusted partner to most major global carriers.¹⁰⁰

Globalization of the Value Chains

In the U.S., the political debate over international trade and foreign direct investment is often driven by a faded view of internationalization. According to the International Product Life Cycle (IPLC) model, a local manufacturer in an advanced country begins to sell a new, technologically advanced product to high-income consumers in its home market. Production capabilities of these advanced-country manufacturers are built locally to stay in close contact with its clientele and to minimize risk and uncertainty. When demand rises from consumers in other, primarily advanced-country markets, production increasingly shifts abroad enabling the firm to maximize economies of scale and to bypass trade barriers.¹⁰¹

This model emulates the postwar evolution of U.S. companies into multinational corporations. It evolved at a time when U.S. firms dominated global trade, and the U.S. per capita income was the highest of all major developed economies. In the model, a local manufacturer in an advanced country sells a new, technologically advanced product to high-income consumers in its home market. Today, the model is history.

During the past decade, an increasing share of revenues from Huawei's industries has come from large emerging economies.¹⁰² In this new competitive landscape, advanced nations represent relatively lower volumes but higher margins (since their population base is smaller but average prosperity higher), while emerging economies represent higher volumes but lower margins (since their population base is much higher but average prosperity significantly lower). The U.S. remains a central source of inventions and innovations, but it is no longer *the* source for either. Like production, innovation activities – as reflected by R&D and patents – are increasingly dispersed worldwide. Demand is no longer just in the advanced countries but increasingly in large emerging economies, which provide locations for production, innovation, even branding. In the case of some U.S. companies, such as Apple, the entire production has been offshored to large emerging economies, especially China. Competition does not come just from other local and domestic players, but from multinationals worldwide and incumbent leaders in domestic markets. Overall, product cycles are more compressed. Exports no longer come into the picture only at the end of the new product phase, but often in the very beginning.¹⁰³ And since production is dispersed globally, FDI does not follow with maturation, but starts with the new product.

In the past, supply chains had been instituted in North America, Western Europe, Oceania and Japan. Now they have also been established in large emerging economies. In the process, the supply chains have been regionalized, particularly in East Asia. In many industries – particularly the ICT sector – the idea of a one-nation one supply chain has disappeared. No one can any longer dominate the full value chain. The new paradigm highlights the global interdependency of all nations.

Two Views on the ICT Ecosystem

Two decades ago, James F. Moore defined the business ecosystem as “an economic community supported by a foundation of interacting organizations and individuals—the organisms of the business world.”¹⁰⁴ This means that companies need to become proactive in developing mutually beneficial (“symbiotic”) relationships with customers, suppliers, and even competitors. Using ecological metaphors to describe business structure and operations is increasingly common especially within ICT sector, and the idea of the ecosystem is particularly central to Huawei. In the U.S., industry firms see Huawei as a fast follower that is rapidly morphing into a global innovator. From Texas Instruments to Intel, these ICT giants are now developing the ICT ecosystems in partnership with Huawei whose executives speak in their events and conferences.¹⁰⁵

When John Roesse was appointed the head of Huawei’s North American R&D, his mandate was to innovate and to cultivate the ecosystem. Instead of isolated units, Huawei’s R&D is relatively integrated. By the time a new technology is ready for transfer, a product team in China is ready to move ahead. “However, you need to have very good export control for things to work,” Roesse adds. “And ours is known for being very robust and conservative. We want to fully comply with export legislation, ensure export licenses well ahead of time because we know that, as Huawei, we’ll be highly scrutinized. So we built a gold standard model for the process to facilitate things.”¹⁰⁶

This is the *technology view of the ICT ecosystem*. It highlights the role of risk capital and entrepreneurship, global innovation and competitive intensity. It is very different from the *political view of the ICT ecosystem*, as reflected by the case of Huawei in the U.S. This latter view highlights the role of government intervention, national innovation, and anti-market intervention at the expense of competitive rivalry. As Roesse puts it, “the political view is not just different, but bizarre. In that view, we at Huawei are some sort of an alien entity in the U.S.” A deep disconnect prevails between the technology view and the political view of the technology ecosystem:

The political forces have missed a generation. They have missed the fact that the technology ecosystem is already globalized. There is no such thing as regional technology, especially in telecoms. It doesn’t exist. If you want to build a national cellular infrastructure today and the requirement is that it must be built with U.S.

companies and US technologies, you couldn't do it. There are five vendors you could choose from to build a nationwide cellular infrastructure. One is Finnish, another is Swedish, the third is French and two Chinese vendors. That's it. There's nobody in the U.S. that can do it for you."

Ironically, Washington believes that there still is a U.S. industry that it must protect; that this industry, or its leaders are American; and that government's anti-market interventions will not have anti-competitive consequences. For all practical purposes, there is an ecosystem that should be protected, but it is co-evolutionary, interdependent and global. U.S. companies continue to have a critical role in that global food chain, mainly in R&D that is high-cost but high-value; it is a very specialized niche that global innovators like to tap on. The current anti-market interventions by the U.S. government do not ensure security or protection in the ecosystem.

Let's assume for argument's sake that there is a disconnect between these two views on the ICT ecosystem: what *could* be done to minimize risks? "First of all, we should stop wasting our time trying to exclude from the ecosystem one technology company thinking that's a solution to our security threats," says Roesse. "Wasting our time trying to control a vendor of point of origin without trying to control the supply chain is a stupid approach to security because it only creates a façade of security."¹⁰⁷ The irony is that appropriate risk mitigation would not only substantially reduce risks, but it would create an entirely new industry that touches every piece of technology that's highly optimized to U.S. market. "The challenge of security cannot be resolved by excluding a vendor of different point of origin, which operates in the U.S. employing Americans. Nor can it be resolved by a company, such as Cisco, that does have a headquarters in the U.S., but whose R&D is globalized and dispersed, and whose supply chain is much like ours."

8. INNOVATION

At Huawei, R&D has always been greatly valued. According to the tacit “company law,” at least 10% of revenue is allocated to R&D on an annual basis. Its large spending on R&D is unusual among Chinese telecom firms – and increasingly among global giants.

World-Class Innovation

For years, Huawei has attracted many of the best and brightest Chinese college students to work in the company. In China, it is seen as a tough, but inspiring, rewarding and generous company, which has a global mindset. Huawei's R&D expenses totaled \$3.7 billion (RMB 23.7 billion) in 2011, and the company has spent accumulatively over \$15.7 billion (RMB 100 billion) on R&D over the last decade. Huawei has set up 23 research centers in Germany, Sweden, the UK, France, Italy, Russia, India, China, and other countries. While most research in R&D is concentrated in China, the cutting-edge areas are where the cutting-edge talent is.¹⁰⁸ This is one layer of innovation activities at Huawei, which essentially marries Chinese engineering with world-class innovation technologies. Another layer consists of 34 joint innovation centers with top carriers, which are very customer-centric, focusing on specific solutions (**Figure 8-1**).

Figure 8-1 R&D Center at Huawei Global Headquarters in Shenzhen



Source: Huawei

Until around 2008-2009, Huawei was perceived as a “fast follower.” Since then, the company has been moving from imitation to innovation. The rapid expansion of R&D

and intellectual property rights within Huawei, reflect this transformation. What motivated the transition? “The customers,” says John Roese, who heads Huawei’s North American R&D and joined the company as it began to shift from a traditional execution-oriented equipment manufacturer to more risk-tolerant global solutions leader. “Once we started to become a dominant vendor, the customers expected us to tell them where the industry was going. In the past, they had seen us as somebody who knew how to control the costs and execute. As we have become a dominant vendor, they look us as a global innovator.”

In the ICT sector, consolidation has supported the rise of emerging-country challengers that engage in reverse innovation. The latter begins by focusing on needs and requirements for low-cost products in countries like India and China. Once products are developed for these markets, they are then sold elsewhere - even in the West - at low prices, which creates new markets and uses for these innovations.¹⁰⁹

Until 2008, the network infrastructure market was larger than the handset market. Operators were focused on building greenfield networks covering huge swaths of territories, and overlaying 3G capabilities on their existing 2G networks. In the infrastructure, former North American giants Lucent, Nortel Networks and Motorola have been acquired by their European counterparts Alcatel, Ericsson and Nokia Siemens Networks, respectively. This consolidation, however, has not impeded Huawei from making a significant dent on the market share of the established vendors. The combined market share of Huawei and ZTE in the infrastructure space grew five-fold in the period between 2006 and 2009, from 5% to 26%.¹¹⁰

In the first quarter of 2012, China overtook the U.S. as the world’s largest market for smartphones. The Chinese smartphone market could grow from 100 million units in 2011 to 250-300 million units in the coming years, given over 1 billion mobile subscribers in the country.¹¹¹ The company’s gross profit margin dropped 6.5 percentage points to 37.5 percent last year.¹¹² By summer 2012, Huawei was no longer possible to ignore among the smartphone leaders (compare Chapter 7).

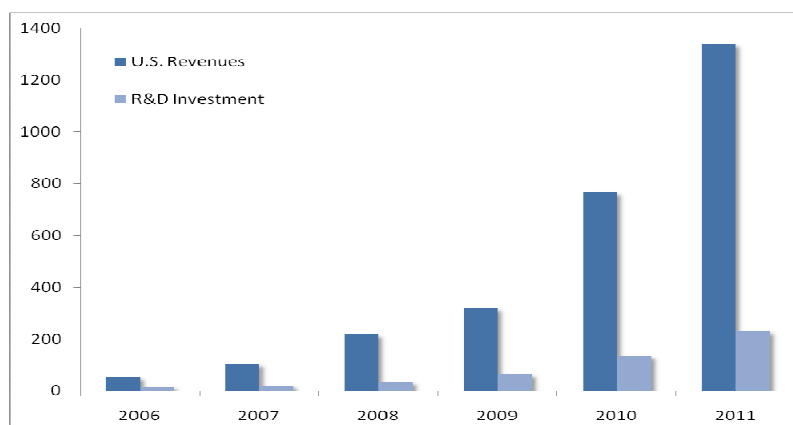
R&D in the United States

Currently, Huawei maintains seven advanced R&D centers in the U.S., developing the next-generation of communications technologies, including the flagship R&D facility in Santa Clara, California. It employs nearly 1,800 professionals and support staff across its 13 U.S. facilities. Huawei’s investments into local R&D amount to 17% of its revenues annually. In America, this translates to high-quality jobs and productive capital. It is seeking for greater risk-taking, which is seen more possible in Silicon Valley. “The idea was to figure out how to scale up Huawei’s R&D not around execution, but around next-generation technology, higher-risk value proposition, and disruptive front-end innovation,” says Roese.¹¹³ “The irony is that we had nothing but problems trying to accomplish that, due to the U.S. governmental culture.”

R&D is a globalized phenomenon. You put resources to where they make sense. If you really want to have an effective global R&D footprint, every region has its characteristics. U.S. matters because of its high-risk, failure-oriented innovation. A friend of mine, Jawad Khaki, Vice President of Windows Wireless Networking, used to describe it as fail forward faster. ‘We’re good at that. We fail, but we get up and try something else fast.’ There are very few places in the world that are good in that. So if we are to become a global innovator at Huawei, we’ll need more of that unique capability. We probably account for 10% of the payroll, but are just 2-3% of total workforce. So it’s a costly, but a very special skill set. That should be seen as a good thing in America.¹¹⁴

In addition to its state-of-the-art R&D centers, Huawei invests in partnerships with institutions of higher education to help create next generation of American ICT experts. It funds a number of research and collaboration programs, investing nearly \$10 million in 2011. Its open innovation research model includes working with ICT experts at America’s elite research universities, including Harvard, MIT, Stanford, UT-Austin, UC-Berkeley, and North Carolina State. Between 2006 and 2011, Huawei’s U.S. revenues grew 26-fold, from \$51 million to more than \$1.3 billion. At the same time, its R&D investment in America increased 15-fold, from \$16 million to \$230 million (**Figure 8-2**).

Figure 8-2 Huawei’s U.S. Revenues and R&D Investment, 2006-2011



Source: Huawei.

In the past, Huawei’s R&D was concentrated in communications technologies. Today, the three R&D domains – communications, enterprise and consumer services – mirror Huawei’s business segments.¹¹⁵ “Our strategy is to generate some \$100 billion in revenues in the next decade,” says Ross Gan of Huawei’s worldwide corporate communications. “And it will have to come from these three businesses.”

Intellectual Property Rights

Huawei pays annually \$300 million in royalties in order to legitimately use the patented technologies of industry peers. It has invested a total of over \$15 billion of its sales revenues in R&D annually in the past decade. It has an open and cooperative approach to IPR, including paid use of IPR and cross-licensing, to reduce the cost of innovations and to contribute to a healthy industry ecosystem. “We have consistently invested 10% of our revenues into R&D,” says Song Liuping, Huawei’s Chief Legal Officer. Since joining the company in 1997, Song has been the driving force for Huawei’s efforts in IPR protection, having successfully completed over 30,000 patent applications.

China’s first patent law was instituted only in 1985. But as a private-sector technology company, Huawei was far more aware of the need for R&D and IPRs than most of its peers. “We created an IPR department in 1995,” Song recalls. “This milestone reflects the shift from understanding the IPRs to valuing IPRs as a source of strategic advantage.” If 1995-2000 was a period of enhanced understanding of IPRs at Huawei, things moved to another level in 2001, when China joined the WTO.¹¹⁶ In China, telecom industry has been open to outside world from the beginning. “Real market competition has allowed entry for equipment manufacturers from seven different countries with eight different standards, which has allowed us to learn more about the process and rules of different players,” says Song.

In the U.S., Huawei’s innovation capabilities have been contested ever since it arrived in the marketplace, especially by Cisco.¹¹⁷ It learned that the greater the patent portfolio, the more substantial bargaining power it can exercise in settlement talks.¹¹⁸ In 2010, Motorola filed a complaint naming Huawei as a co-defendant in an alleged theft of trade secret, but the case was dropped in spring 2011. Motorola and Huawei settled a case, which involved the Nokia Siemens Network acquisition of Motorola’s wireless network business.¹¹⁹ In a further move to protect its intellectual property, Huawei filed lawsuits in April 2011 against ZTE, which countersued Huawei for patent infringement.¹²⁰

As of 2011, Huawei had filed 36,344 patent applications in China, 10,650 under the Patent Cooperation Treaty (PCT), and 10,978 patent applications overseas.¹²¹ It has applied for 49,040 patents globally and it has been granted 17,765 to date. In 2010, Huawei paid companies in the West \$222 million in licensing fees. Of that total, \$175 million was paid to American firms. Over the years, it has paid Qualcomm alone over \$600 million in fees related to their intellectual property.¹²² In spring 2011, Cisco’s CEO John Chambers identified Huawei as its toughest rival, stating that the Chinese company doesn’t always “play by the rules” in intellectual property protection and computer security. When asked to specify actions by Huawei, Chambers only suggested that Cisco is considered trustworthy by governments around the world.

In the past, the U.S. dominated R&D, patents and IPRs. Today, the world of technology innovation is more dispersed, distributed and decentralized. “Today, technology moves faster than ever before,” says Song. “It can no longer be restricted to any one geographic location. U.S. will remain central, but other nations are improving their R&D capabilities.”

Industry Standards

“Huawei is transforming from a Chinese company to a global company based in China,” says Richard Brennan, Vice Director of Industry Standards. The company no longer just responds to industry standards, but is actively shaping them. That is where Brennan comes into the picture. He is in charge of industry standards strategies and policies, across the organization.¹²³ “What we see coming are millions of apps,” he adds. “They are not necessarily apps that you would get involved with; they are apps working for your behalf, in the background, machine-to-machine apps”

Huawei supports mainstream international standards and contributes to the formulation of such standards.¹²⁴ In terms of standards and the ICT, two areas are of particular importance today: LTE and cloud computing. The former is an abbreviation of “Long Term Evolution,” a broadband standard for wireless communication of high-speed data for mobile phones and data terminals.¹²⁵ In 2011, Huawei was awarded six top LTE awards from around the globe. Another important area for the future is cloud computing; the delivery service of computing and storage capacity. At the foundation of cloud computing is the broader concept of converged infrastructure and shared services. Huawei has played a major role in standards development in cloud computing and is one of the DMTF's 14 board members.¹²⁶

Huawei's rapid expansion and internationalization has been accompanied by its increasing involvement in standardization. “As you internationalize, your equipment must talk to the existing networks to be deployed and must ultimately talk to other bits of equipment that are embedded in those networks,” says Brennan. Initially, the goal at Huawei was to be able to follow various regional standards in Europe, Americas and so on. Now it is becoming a thought leader in standards worldwide.

While the broadband (4G) standards will be the first truly global era, a small number of nations will continue taking the industry innovation further.¹²⁷ As Huawei is moving from carrier business increasingly to consumer and enterprise spaces, “we probably will find ourselves dealing ever more with these issues. We already license quite a lot from US companies. In that regard, it will be a familiar terrain.” It is a two-way street. The era of de facto standards worked as long as the United States had overwhelming superiority across the ICT sector.¹²⁸ If China were to engage in comparable approaches today, other large emerging economies would follow in the footprints, which would effectively fragment the global marketplace. Instead, Chinese ICT pioneers, such as Huawei, seek to operate within the competitive context of international standards, which is in the benefit of all companies, operators, and countries.

In one critical respect, Huawei's standardization differs from that of advanced-country multinationals. It is inclusive. Due to its roots in both large emerging economies and major advanced markets, Huawei is mindful of standardization implications in both kinds of nations. As the World Economic Forum has noted, Chinese companies have been particularly progressive in combining standards activities with China's experiences in clean technology and efforts at corporate global citizenship.¹²⁹

9. NETWORK SECURITY

During the past decade, Huawei has earned the trust of the world's leading telecoms operators with its affordable prices, innovative solutions and globally-proven and secure solutions. It acknowledges that the convergence of digital ICT and the globalization of companies, markets and supply chains have increased the potential for network vulnerabilities. Due to the industry pressures and the U.S. government's accusations, Huawei is growing into the epitome of cyber security in the industry. If industry peers emulated its cautionary measures, global cyber security would still not be safe, but current risks would be significantly mitigated.

Cyber Security

The number of reported cyber attacks on U.S. critical infrastructure has increased sharply, from 9 incidents in 2009 to 198 in 2011. "Risk management and assessment is still an art, not a science," says Lamar Bailey, director of security research and development at nCircle.¹³⁰ The infrastructure security market has rapidly grown over the past decade, with the launch of a host of governmental and international organizations dedicated to homeland security and critical infrastructure protection. The global infrastructure security market in government spending will reach \$32.6 billion in 2012.¹³¹

To strengthen its risk mitigation efforts, Huawei has established and implemented an end-to-end global cyber security assurance system.¹³² "My role is to ensure that our cyber security assurance system integrates end-to-end cyber security into solutions, covering our cloud computing solutions, pipes/telecom and all devices from mobile broadband to PDAs where appropriate, the customer-oriented business processes and the whole ICT supply chain," says John Suffolk, Huawei's Global Cyber Security Officer who is based in Shenzhen and reports directly to the CEO. "I've done a lot of research on Huawei, and I've seen no evidence of a link between the company and the Chinese government beyond a commercial one," he adds.¹³³

The way Suffolk got his job reflects the uncertainty and suspicion associated with Huawei. In fall 2011, he retired from the UK Government, after seven years as the UK Government CIO and CISO, steering £16 billion (today \$25 billion) IT budget per year, with 50,000 IT professionals. In technology, he has been ranked in the top 5 of the most influential people behind Sir Tim Berners-Lee. Despite these accomplishments, he had to undergo a strict vetting procedure by UK security services after taking a job with Huawei, including meeting a Cabinet Office official to discuss the concerns of MI5 and MI6.¹³⁴ Under civil service business appointments rules, Suffolk applied to Prime Minister David Cameron for permission to accept the Huawei appointment in February 2011, which was approved by the PM half a year later, albeit with restrictions.¹³⁵

Over the course of 2011, Huawei identified seven strategic priorities in cyber security assurance: open and transparent cooperation, compliance with rules and regulations on security and privacy, end-to-end proactive prevention, security verification by internationally recognized bodies, traceability, anti-backdoor and anti-tampering, and emergency responses.¹³⁶ It cooperates extensively with governments, customers, and industry peers to address cyber security threats and challenges all over the world. In several nations, including the U.S., Italy, and Spain, Huawei has also commissioned local third-party testing institutes to independently examine its products for security risks and certify them for release.¹³⁷

Cyber Supply Chain Risks Are Global

Today, four of every five major telecoms operators worldwide cooperate with Huawei, including those headquartered in the nations that support or are allies of the U.S. security alignments. Of the 56 networks that are in use worldwide today, half are deploying Huawei technologies. "As an American, I want my government to be vigilant about the security of our information infrastructure," said David Wolf who has examined the rise of Chinese telecom giants, to *Wall Street Journal*. "What that is going to require, though, is something more sophisticated than simply redlining a bunch of vendors."¹³⁸ Indeed, Huawei and its senior executives have consistently advocated greater security efforts across the ecosystem. "It is unfeasible to establish an absolutely impenetrable security assurance system that can keep data flowing securely within the networks (pipes) at all times," says Huawei's CEO Ren.¹³⁹

Over the course of the last decade, critical infrastructure protection initiatives in many countries have not mitigated the growing cyber dependencies, which fuel supply chain concerns.¹⁴⁰ Huawei has been working with cyber security in some form since 1999 after the introduction of the first technical security guideline. "While much has happened since then, what matters is to have these repeatable, consistent processes," Suffolk says. From the standpoint of cyber security, he believes Huawei has three advantages:

You cannot build quality afterwards; you have to build quality into the DNA of the organization. Huawei was blessed in that it brought in IBM in 1997 to support its systems and processes. Because of these processes it is now easy to Huawei to build in additional cyber security requirements. The company also has another advantage. It is a science- and engineering-based organization. The board and the senior executives are people who have a science-based degree. They understand what cyber security means from the standpoint of technology and the supply chain. Finally, Huawei is a young company. They do have some legacy, but not the baggage of how we used to do these systems 15-20 years ago.¹⁴¹

Whatever their purpose, national policies codifying preferences for domestic suppliers create trade barriers, undermine foreign investment, and deprive domestic industry of the benefits of technological innovations from elsewhere in the world, as Scott Charney and Eric T. Werner of Microsoft note in an influential white paper.¹⁴² The question becomes, therefore, “how do countries protect national security interests without inappropriately undermining the value produced by a global supply chain?”¹⁴³ While government concerns are understandable, government responses must not threaten the vitality of the global ICT sector, and stifle both innovation and competition, add the Microsoft authors.¹⁴⁴

Today, integrated global supply chains reign. Huawei sees itself as fully committed to delivering the highest level of security for its customers. With solutions deployed by over 500 operators in over 140 markets, the quality, integrity and security of its solutions can be considered world-proven, and have been rigorously audited and passed all of the security requirements of 45 of the world’s top 50 global operators. According to Huawei, the allegation that the company poses a threat to the national security of the United States has centered on a mistaken belief that it can use its technology to steal confidential information in the U.S. or launch network attacks on entities in the U.S. As of yet, no evidence has been produced that Huawei has violated any security rules. To alleviate security concerns, the company has even volunteered to reveal its source code, as it has done with success in countries such as India and the U.K., while allowing ongoing monitoring through Electronic Warfare Associates (EWA). Huawei has top security clearance with defense and intelligence agencies and therefore can stay abreast of all known cyber risks, says John Lindquist, president and CEO of EWA's infrastructure technologies group.¹⁴⁵

Global network security is not a matter that can be resolved by one country alone. It requires full industry cooperation across the entire value chain, including the industry players and the governments worldwide. Due to the spotlight on Huawei, the company has developed end-to-end security and its technology elements have been through a rigorous process, in contrast to those of its rivals. However, since these security systems will be networked, even that is not adequate. If you take an element of the Huawei network that has been designed to be inter-operable with the systems of Ericsson, Cisco, Lucent and other major industry incumbents, and the carrier combines these elements to a network, the network remains vulnerable. There is only one viable way out, argues Liuping Song, Chief Legal Officer & President of Huawei’s Corporate Legal Affairs: “Technologically, we need to develop international standards. For real cyber security, we need international security, internationally recognized agreements.”¹⁴⁶

The ICT is global and has global standards and is process-oriented. But as Song adds: If everybody is in agreement that it is important to have rules and procedures that make possible an economically efficient ICT marketplace, what justification is there for introducing inefficiencies?

“Assume Nothing, Believe Nothing, Check Everything”

Nevertheless, the current measures are not considered sufficient at Huawei. In June 2012, Ren Zhengfei warned data would be "vulnerable to attack again and again" because technology will develop faster than security. "Cyber security is a common issue that the whole industry has to face. We must join hands to proactively address this issue."¹⁴⁷ As Huawei's Global Cyber Security Officer, Suffolk has an extraordinary platform to establish best practices. Suffolk's approach is predicated on doubt in *all* cases. He believes in the ABC model: "Assume Nothing, Believe Nothing and Check Everything." This approach applies to Huawei as well. "We can't assume our supply chain is safe, given that two-thirds of the components Huawei relies on do not come from the company, but around the world," he says.¹⁴⁸

The simple fact is that in cyber security there is no gold standard, no real international standards. Despite a lot of written policy-based standards and best practices, there is no evidence that people actually execute those policies. The Australian Defense signals Directorate (DSD) has developed top 35 Mitigation Strategies for targeted cyber intrusions.¹⁴⁹ Implementation of these strategies is said to eliminate the potential of some 85% of cyber security threats. And the execution of just four of these strategies is said to take away some 70%-80% of the threats. "But if I ask the Australian government and other governments in the world, do you implement those four strategies, the answer is: No. But why not?" asks Suffolk. "I ask our American colleagues, do you implement those four strategies? "No," they respond. Are they mandatory? No, they say. How can you talk about cyber security requirements, laws and regulations when you don't do even the basic hygiene on your technology? I can't find one country in the world that does it. So when we talk about the gold standard, it's a fallacy."¹⁵⁰

Governments have always spied each other. Now they have digitized and are on the Web, but they also purchase technologies that allow them to crack into other governments' systems. The new cyber world has amplified old security risks. Nonetheless, most of these risks could be managed (**Figure 9-1**).

Now, let's assume for the argument's sake that, Huawei, along with very few companies in the world, may actually represent highly advanced cyber security. If that is the case, why does Washington continue to go after Huawei? Suffolk spends a lot of his time on Capitol Hill and in various security committees and think-tanks. He believes that every country has a different set of values, a political outlook, a commercial and an economic outlook. And it is that DNA of the country that sets the tone for the conversation. Now, when he is the U.S., say, across the table against the Department of Commerce and their China relations and he is being told: John, you can't tell us that the Chinese government cannot tell Huawei what to do. "So let's assume they do. But in the U.S., the government can tell U.S. companies what to do. Then you can see the pain in their faces. The bottom line is that you can't assume that all things East are bad, and all things West are good. In terms of security, we have to be suspicious of everybody."

Figure 9-1 Do We *Really* Want to Fix the System?

But if the challenge of cyber security is pervasive because contemporary global supply chains are pervasive – highly distributed and globalized – what *should* be done about it? As far as John Suffolk, Huawei’s Global Cyber Security Officer, is concerned, cyber security is an issue of multiple dimensions.

1. Diplomatic Level. International problems require international diplomacy. By the same token, it is vital to examine the challenge of cyber security on a worldwide basis. A while ago, Russia issued a draft paper on cyber security, but it was initially ignored by governments because they did not agree with the starting point. Today, more governments are looking at the Russian paper, if only to develop agreement on basic definitions. Even the meaning of “cyber warfare” is not too clear. Some countries view social networking sites as anti-democratic, others have a precisely opposite view. There are analogies of biological and chemical warfare. Today the threat is that a nation’s critical infrastructure can be breached. So it’s time to pick up the Russian paper, get diplomats to work through the document, to make note of where they can agree and where they can’t. It won’t be easy, but I think we can agree about most things.

2. Best Practices. Then we could deploy the best practices, based on the Australian approach. It should be mandated across critical infrastructure, across federal, state, local levels, and across sensitive industries, such as banking, health care and so on. That would raise the bar.

3. International Standards. In that context, the issue of international standards should be raised. What if I asked you, what’s the safest Internet browser? It’s a difficult question because we know the answer. We talk about cyber security, but how can we worry about such things when the basics of cyber security have not been implemented? There’s no standard for Internet browsers. So let’s make international standards. Sure, they won’t be perfect, but you must start from some place. Then let’s try to validate those standards. And then governments can start buying only the safest products. Here’s an analogy: If the brakes of my car have to be tested for security, if every electrical component in the world must be tested for security, then why not have the same approach in cyber security? Why don’t we think that it’s important?

4. Intellectual Property. Name just one company whose balance sheet has been reduced because they have lost intellectual property, which, in turn, has reduced the value of the company? The law is quite clear. You have a fiduciary duty to tell your shareholder. There are legal requirements if they have lost intellectual property for \$200-\$300 million. And yet, never have I seen such an audit or balance sheet adjusted. I have raised these questions across the world to bring home the very naiveté of the level of discourse we have on cyber security.

5. Independent Validation. And finally, I would add independent validation and certification effort. Throughout the ABC approach should prevail: Assume nothing, believe nobody, check everything.

Although we certainly try our best, an argument can be made that there’s little use of having Huawei safe, if other products and services are not safe and they are networked across the global supply chain. In that case, even tough efforts defeat the purpose.

The bottom line is that the development and implementation of just few very basic things would clear out the landscape in cyber security. If we *really* wanted to fix the system, we could do it.

America has always positioned itself as the technology powerhouse of the world. Today it is all being challenged. "What we are seeing in Washington is something of a push-back, by the nation that hopes to remain the No. 1 in the world," he adds. But he believes things are changing. When he first came to the U.S. as a Huawei employee half a year ago, the conversations were still about the company as a security risk. The big difference is that they are no longer saying that Huawei is a security threat, but that this is a global supply chain issue. "They know they buy a lot of their equipment outside Huawei, including in U.S. and European companies from China," he says. "It's a bit meaningless to talk purely in China-centric terms when our localization rate is 80% and only one fifth of our employees are Chinese."

On Capitol Hill, the challenge is now called a "Huawei problem," but they know that it is not a "Huawei issue." They know the world is going global in terms of technology and supply chain; it's got everybody with their pants down. After reflection, Suffolk adds: "I believe America actually wants Huawei to operate in the U.S. I think it has made that decision. But Huawei is now a pawn in a world trade bargaining."

10. CONCLUSIONS

Today, Huawei employs 140,000 people worldwide. Less than 1.3% of its personnel are in the U.S. The roadblock is not the American marketplace, but the U.S. government. The question is why.

Systemic Friction

As long as Japanese trade was primarily about exports, the U.S.-Japanese friction escalated rapidly. Chinese companies have learned from their experiences in the U.S. In the 1970s and 1980s, American multinationals fell behind their Japanese rivals; it was only when the latter could create jobs and bring capital into the U.S. marketplace that these strategic differences gradually converged. When Japanese investment in the U.S. took off, the friction began to dissipate. Toyota, Sony, Honda and other Japanese companies created American jobs, promoted growth and increased U.S. exports. Today, they employ nearly 700,000 Americans.

And yet, despite some parallels, the arrival of Chinese companies and FDI into the United States occurs in a very different context. In the 1980s, Japan's GDP per capita was catching up with that in the U.S. China's GDP per capita remains significantly lower than its counterpart. In brief, the U.S. and Chinese economies are in very different stages of economic development. Japan remains relatively insular in comparison to China; China has been far more open to foreign multinationals than Japan (or the United States).¹⁵¹ Japanese companies globalized during the boom years of globalization; Chinese multinationals are going global at a time of rising protectionism. Japanese challenge comprised few, primarily high-tech industries; Chinese companies reflect both high-tech and low-tech industries. Japan was America's key strategic ally in East Asia; China, due to its different political system, is seen both as a competitor and a cooperater. China is sui generis, in a class of its own. But so is the opportunity that it provides.

After three decades of economic reforms and opening-up policies, China's development is entering a new stage. As China is transitioning to technological maturity, the new stage of growth is most prevalent in those regions where economic reforms were first initiated, such as Shenzhen in the Guangdong province, Huawei's home base. In the coming decades, China will need advanced technology and know-how, whereas America will need jobs and capital. Due to their different development stages, the assets of these two nations are complementary. In the case of Huawei, however, systemic political differences have been used as economic policy instruments in anti-market interventions.

Until the 1980s, advanced-country multinationals dominated FDI flows worldwide. Today, emerging-country multinationals play an increasingly central role in global FDI. Despite their great diversity, they all come from nations in which GDP per capita is substantially lower than in the advanced economies. For instance, Chinese living standards remain a fraction of those in the U.S. While sophisticated global multinationals as Huawei have rapidly gained expansive capabilities in differentiation and innovation, they continue to have superior cost-efficiencies.

Tragically, U.S. government's efforts to complicate the expansion of Chinese multinationals in America are frustrating a generation of elite executives in China.

Huawei's Global Leadership

Starting in a shabby one-room workshop in Shenzhen in the early 1980s, Huawei is today a global giant generating over \$32 billion in annual revenues, with offices in more than 140 countries. Like Sam Walton's Wal-Mart in the U.S., it first created foothold in rural regions, which were neglected by both foreign multinationals and China's national champions, and only then proceeded to capture urban centers. Huawei's expansion has emulated the geographic momentum of Chinese urbanization. After a difficult transition in the early 2000s, it leveraged its strategy in global markets with the support of U.S. consulting giants.

During the past few years, several unspecified allegations – particularly those relating to the ownership of the company, and the role of its founder President Ren Zhenfei – have led to severe anti-market measures to block Huawei's expansion efforts in the U.S.

Since 1990, Huawei has rewarded some 65,000 employees with the right to buy Huawei stock. The stock ownership plan has allowed the company to attract and retain talent. Ren Zhengfei owns only 1.4% of shares in Huawei; the remaining 98.6% belongs to employees. Currently, Chinese rules prevent companies with large employee ownership from going public. As Huawei continues to globalize, it will have to comply increasingly with both Chinese and global corporate norms.

In the United States, the CEO of Huawei has been on the spotlight more than anywhere else, due to the unsubstantiated allegations of his role in the People's Liberation Army (PLA) and the Chinese Communist Party (CCP). In the absence of real evidence, these suspicions reflect a tragic misunderstanding.

Struggling his way from humble circumstances, Ren was not only confronted by the potential of abject poverty that threatened all Chinese lives, but the legacy of the nationalist Kuomintang that led his parents to labor camps in the 1960s. It was Ren's success that paved his way to the PLA's engineering forces and the CCP. However, the influence of private entrepreneurs within the party has increased mainly after the 16th Party Congress in 2002. Since then, Jian Zemin's theory of "Three Represents" has supported the CCP's goal to open up the Party to "the overwhelming majority of the

Chinese people", including businessmen and managers. This policy is in line with Chinese views on inner-party democratization; it could also be seen to be in line with U.S. goals of democratization. In the absence of substantiated evidence to the contrary, Ren and his life story should be seen as a wonderful opportunity to open Chinese history and Chinese business world in America. Ren should not be shunned by the Capitol Hill. Rather, he could be a welcome guest and advisor in the U.S.-China relations.

Huawei's success has also been attributed to financial support from the Chinese government. In the first decades of the reform era, the Chinese government did have preferential policies, but these favored foreign multinationals, not Chinese companies. Typically, the allegations of Chinese state subsidies to Huawei surfaced in summer 2010; only a month or two after the onset of the Eurozone debt crisis.¹⁵²

The credit lines made available through Huawei by the banks are designated for Huawei's customers, not to Huawei. The matter of export credit financing is hardly limited to Huawei, China, or even other large emerging economies. It comprises all economies, including the advanced economies. U.S. and Western living standards are still far higher than those in China. Chinese companies enjoy great cost efficiencies, which are also available to those advanced-country multinationals that have productive capacities in large emerging economies.

Contested Issues

During the past few years, Huawei's expansion efforts in the United States have been repeatedly rebuffed by the U.S. government. Viewed from the U.S. perspective, Huawei is currently perceived as a threat, but the company could be seen as an opportunity, whether the focus is on the M&As, competitiveness, innovation, or network security.

Frustrated Expansion Efforts. Since Huawei has not been able to invest as much as it would like in America, only 1.3% of its employees are located in the U.S. In 2007, Huawei's effort to buy 3Com was thwarted by political forces. After the failed acquisition of 3Com, Huawei sought to acquire 3Leaf Systems in May 2010 for \$2 million; in early 2011, U.S. regulators forced it to unravel the purchase. In fall 2010, Sprint Nextel solicited bids for a network upgrade, which might have gone to Huawei had it not been another intervention by the Congress and even by Secretary of the Commerce Gary Locke (current U.S. ambassador in China). The deal with Huawei would have saved Sprint at least \$800 million from its existing costs in its first year of operation alone. In spring 2012, the Huawei-Symantec joint venture stopped trading, following the U.S. government's blockade of several acquisitions. Nonetheless, Huawei has been able to expand its customer momentum in the mid-tier, which has made possible deals with U.S. companies that carry Sprint's 4G traffic and that operate secure-channel communications for over 200 government agencies, a U.S. defense contractor, and the backbone of the Internet, an IP transit network across the U.S. and Western Europe. If

Huawei truly is a security risk, it is difficult to understand why the government has not intervened in these cases. Inconsistencies in the government's approach only add to the perception of the uncertainty.

Competitiveness. In addition to differentiation and innovation, Huawei continues to exert a major impact on price competition in the markets in which it competes. Before it began bidding for large European telecom-equipment contracts in 2004, gross profit margins for major players amounted to 45%–50%. As Huawei joined these rivalries, profit margins plunged to 30%–35%. In the U.S. gross margins for telecom equipment in are 45%-50%. In this quasi-monopolistic environment, entrenched leaders have a strong motive to deter Huawei from the marketplace. Such conduct, however, benefits neither consumer welfare nor strong equipment vendors in America. Additionally, the political debate over foreign multinationals in America still reflects the world of the postwar internationalization, even though the faded idea of a “one-nation one supply chain” dissolved in the ICT sector a long time ago. What the new paradigm highlights is global interdependency. Today, multinationals operate worldwide. Production has been largely offshored to foreign, primarily emerging economies. Increasing multilateral and multipolar cooperation is needed to cope with the new opportunities and threats in the 21st century.

Innovation. At least 10% of revenue is allocated to R&D on an annual basis in Huawei. Currently, the company maintains seven advanced R&D centers in the U.S. Unlike most U.S. companies, Huawei investments into local R&D amount to 17% of its revenues annually. In America, this translates to high-quality jobs and productive capital. In addition to its state-of-the-art R&D centers, Huawei invests in partnerships with institutions of higher education to help create next generation of American ICT experts. Between 2006 and 2011, Huawei's U.S. revenues grew 26-fold, from \$51 million to more than \$1.3 billion, while its R&D investment in America increased 15-fold, from \$16 million to \$230 million. In 2010, Huawei paid companies in the West \$222 million in licensing fees. Of that total, \$175 million was paid to American firms. Over the years, it has paid Qualcomm alone over \$600 million in fees related to their intellectual property. Huawei brings to America attractive jobs and productive capital.

Network Security. Today, four of every five major telecoms operators worldwide cooperate with Huawei, including those headquartered in the nations that are U.S. allies or support U.S. security alignments. Of the 56 networks that are in use worldwide today, half are deploying Huawei technologies. Due to its efforts to ensure cyber security, Huawei could be seen as a role model for security practices. It has established and implemented an end-to-end global cyber security assurance system, which is considered an integral part of its development strategy, along with strategic priorities in cyber security assurance. It cooperates extensively with governments, customers, and industry peers to address cyber security threats and challenges all over the world. In several nations, including the U.S., Italy, and Spain, Huawei has also commissioned local third-party testing institutes to independently examine its products for security risks and certify them for release. Additionally, it has opened up its source code. Given that two-thirds of the components Huawei relies on do not come from the company, but around the world, the company's approach is predicated on pervasive suspicion and the

ABC model: “Assume Nothing, Believe Nothing and Check Everything.” As a special case of the globalization of value chain activities, cyber security requires intensified multilateral, multipolar and international cooperation. Current anti-market interventions by the U.S. government do not ensure security in the ecosystem. Nor do they protect it. Rather, they are downgrading the ecosystem’s efficiencies. On Capitol Hill, the challenge is called a “Huawei problem,” but Washington knows that it is not a “Huawei issue.” Rather, it is a global issue of technology and supply chain. If the cyber security system is really to be fixed, that requires a multidimensional approach, focusing on the international diplomacy, best practices, international standards, intellectual property, and independent validation.

Wrong Messages

Recently, the U.S. Chamber of Commerce, in cooperation with Deloitte, Las Vegas Sands and the Albright-Stonebridge Group, released a pioneering report of Chinese FDI in the United States, believing that the two-way foreign investment can yield “significantly increased benefits to both countries.”¹⁵³ It was supported by interviews with top executives of Chinese companies in America. According to Thomas J. Donohue, President and CEO of U.S. Chamber of Commerce, these executives see the U.S. market as “highly competitive, open, and attractive. There are challenges, but they can be managed.”¹⁵⁴ The report included some 16 success stories, including those of China Telecom, Haier, Lenovo, even ZTE and CNOOC – but Huawei was excluded, even though its FDI in America exceeded that of most other Chinese companies. The simple conclusion is that Huawei is not yet recognized among the faces of Chinese investment in the U.S.

The expansion of Chinese companies has led to significant economic contributions in the foreign markets in which they operate, in the form of job creation and contributions to GDP and local taxes, says the prestigious World Economic Forum (WEF). As an exemplary case, Huawei illustrates the “emerging best practices of Chinese globalizers,” as the WEF puts it. Given the relatively anemic condition of the global economy, Chinese companies have been welcomed by many foreign governments for the employment opportunities that these investment activities have created.¹⁵⁵

In their analysis of U.S.-Chinese FDI prospects, Dan Rosen and Theo Hanemann offer a series of recommendations intended to alleviate the risk of diverting Chinese direct investment from the U.S. by maintaining the best possible security screening process, keeping America’s door open to the benefits of a China going global, and actively attracting the right investments from China so that the benefits for Americans are assured.¹⁵⁶ In the case of Huawei, however, these recommendations have all been ignored or violated.

Send a clear and bipartisan message that Chinese investment is welcome. This is precisely what has not happened in the case of Huawei. While Vice President Joe Biden

has spoken for Chinese investment in the U.S. and President Obama has made broad statements about openness, senior officials often express misgivings. As talk of a bilateral investment treaty has been in limbo, Chinese officials have had to ask for guidance regarding U.S. industries that are open or closed.

Systematize the promotion of FDI from China and elsewhere. America's current laissez-faire approach toward incoming FDI is a relic from the postwar era, as is the dated view of internationalization. Both should be thoroughly reviewed in light of the emerging multipolar world in which the U.S. still has a critical role to play, but in which the U.S. no longer dominates either global FDI or global value chains.

Protect the investment review process from interference. Along with the polarized Washington, the U.S. investment screening suffers from politicization and lack of transparency in the formal decision-making process.¹⁵⁷ In particular, anti-market interventions against Huawei represent severe politicization and minimal transparency.

Work to better understand Chinese motives. Far more education is needed to better understand Chinese motives and to reduce the current bias. The case of Huawei is vital in this regard. It reflects not only poorly understood, but effectively misunderstood Chinese motives, including corporate governance, and the life story of President Ren.

Increasing transparency. Opaqueness and lack of transparency are not privileges of emerging-country multinationals, but typical to advanced-country multinationals as well. However, Huawei is not a state-owned enterprise. Nor should it be regarded as one. Nonetheless, by making corporate governance more transparent, the company can defuse obsolete barriers in America. In turn, the United States should not base its investment review system on questions of reciprocity, especially if the latter are defined primarily in the terms of advanced economies.

Remain open to "what if" scenarios. Currently, China is a price taker in many markets. In the future, China is likely to become a price maker. This has sparked great concern among U.S. policy authorities who are afraid that "artificial pricing structures" may contaminate global markets. Conversely, today's advanced countries are price makers in markets that China dominates, which is not seen as a problem in the West.

Do not play the reciprocity game. The term "reciprocity" has been used too frequently in the context of Chinese investment: if China is perceived as discriminatory against U.S. investment, the U.S. should reciprocate in kind. While China has significant inward investment restrictions, it has been a leader in direct investment openness for decades. The use of reciprocity, coupled with opaqueness in decision-making and minimal transparency by agencies, such as CFIUS, is creating a de facto blueprint for mirror-like Chinese measures to protect perceived strategic industries mainland.

Get our own house in order. Finally, and most importantly, FDI can only be attracted with sound financial and commercial prospects. The single most important step in attracting foreign investment that creates long-term value in the economy is to address the current political and economic problems that the United States faces, especially the looming "fiscal cliff" after the 2012 election.

As long as these barriers continue to deter Chinese FDI in the U.S. the unequivocal message is that, yes, America is open for business, but not for Chinese business. Such a perception is not in line with the American self-image as the “land of the free.” Yet, the simple reality is that many Chinese senior executives already see the nation as the “land of the Iron Curtain.”

Internationalization of Anti-Market Interventions

As a multi-agency committee established within the Executive Branch, the Committee on Foreign Investment in the United States (CFIUS) has historically monitored the impact of and coordinated U.S. policy on foreign investment in the United States.¹⁵⁸ While the CFIUS used to operate in relative obscurity, the failed acquisition of Unocal Oil by the China National Offshore Oil Company (CNOOC) in 2005 and the proposed acquisitions of the commercial operations at six U.S. ports by Dubai Ports World in 2006 were partly due to concerns by CNOOC about an impending CFIUS investigation of the transaction.¹⁵⁹ Anecdotal evidence suggests that the CFIUS process has not been market neutral.¹⁶⁰

While the Obama Administration has rhetorically supported free flow of FDI, the lack of clear policy statements in support of FDI contributes to current uncertainty.¹⁶¹ Policy leverage has shifted from the administration to the Congress. While the President is seen as exercising broad discretionary authority over U.S. direct investment policy, including the authority to suspend or block investments that “threaten to impair the national security,” Congress is now more directly involved and more assertive in formulating the scope and direction of U.S. foreign investment policy.¹⁶²

In the light of the CFIUS actions in the past decade, its controversial decisions and possible use of deterrence as effective policy instrument, proposed lack of transparency, anti-market process and added uncertainty, current proposals to expand CFIUS should be assessed with appropriate prudence and discretion.¹⁶³ To contain congressional ad hoc meddling in Chinese FDI, and to avoid situations such as the Sprint contract intervention, the think-tank Heritage has recommended expanding the authority of CFIUS to include oversight of equipment supply contracts. However, such a large expansion of CFIUS’s reach and authority might have the unintended effect of making the current de facto interventions de jure.¹⁶⁴ Rather, what is needed is increased transparency in the current CFIUS process: the nature of the security threat could be explained (e.g., the 3Leaf patents); a general set of guidelines could offer the rationale behind the Committee’s deliberations and decisions. Such changes would not work against the mandated goals of the CFIUS process, but support it, as members of the U.S. intelligence community have argued.¹⁶⁵

The current excesses of the CFIUS provide a replicable blueprint for political interventions in the economy, e.g., China’s announced intention, along with new provisional regulations, to screen new foreign investment on security grounds. The U.S.

government and key U.S.-China business organizations, such as the U.S.-China Business Council and the U.S. Chamber of Commerce, have protested what they call the vagueness of the proposed new rules and the lack of transparency in the regulatory process. But the bottom line is that the proposed rules and regulatory process are mirror images of their U.S. counterparts. The same goes for the White House's task force, which was established to evaluate the "opportunities, risks and implications" posed by foreign telecom companies in the U.S. market. While no particular company or country was targeted, Huawei's expansion in the US market was a "key impetus" for the initiative. While the decision to establish a White House project moves the process beyond CFIUS, it provides still another blueprint for other nations to elevate the status of political interventions in the economy.

The unintended consequence of the CFIUS excesses is the internationalization of anti-market interventions – the reverse of the intended objective.

Attempts at Explanation

Interviews with major representatives of U.S. and Chinese government agencies, senior executives, analysts and journalists suggest that there are at least three possible narratives that have been deployed to explain Huawei's unique fate in the United States. In each case, Huawei is seen as a threat, not as an opportunity. Only the nature of the threat varies – from security to commercial markets and military risk.

Military Threat. In this narrative, the Cold War is over, but another one is evolving. Since September 11, 2001, America has struggled against terrorism in the U.S. and worldwide. China's economic reforms have had the same role as those in Germany and Japan in the 1930s: they prepare for war and conquest. The rise of Chinese multinationals represents not just an economic opportunity, but a potential security and military threat. The strategic objective of such multinationals is to destroy their U.S. rivals. What makes Huawei different is that it is also a strategic threat. It plays the key role in the Chinese cyber war effort to downgrade America's critical information infrastructure. It is thus in the U.S. interest to deny Huawei's entry into the U.S. marketplace. Since, however, the evidence on the "real Huawei" must remain classified, the government needs to use non-traditional measures to complicate Huawei's expansion in America. And if neither official nor unofficial measures suffice, it is the patriotic duty of U.S. chiefs of defense, security and counter-intelligence to warn U.S.-based companies of the consequences of cooperating with Huawei.

Security Threat. This is the official approach. According to the narrative, America is open to business, but it cannot be complacent with security threats, which is what Huawei represents. China's economic reforms have greatly benefited the global economy, but they can go only so far without concomitant political reforms. In the absence of such reforms, the rise of Chinese multinationals has potential to contaminate global business. Huawei's business achievements are acknowledged, but

they are attributed to government intervention and the behind-the-façade maneuverings of Huawei's CEO. The company's potential employment and investment effect are recognized, but they cannot happen at the expense of American security. In fact, Huawei is subsidized by the government. Its innovation remains imitation. Its security operations are designed to disguise the PLA's efforts to use the company in a cyberwar. In turn, Huawei seeks to devastate competition by reducing U.S. companies' margins leadership. It is thus in the American interest to complicate Huawei's entry into the U.S. marketplace. Since, however, the evidence on the "real Huawei" is mainly classified, the government needs to use non-traditional, asymmetric measures to insulate Huawei in America.

Commercial Threat. This is a variation of the official approach. In this narrative, America is open to business, including Chinese business. However, it remains unclear whether Huawei is a commercial entity or a security threat. China's economic reforms have greatly benefited the global economy. Ideally, they should have accompanied with political reforms. In the absence of such reforms, the rise of Chinese multinationals is bound to generate systemic friction, which is unfortunate, but can be overcome over time, as reforms broaden in China and Chinese multinationals become more powerful worldwide. Huawei's business achievements are acknowledged and attributed primarily to strategic success. While Huawei's CEO generates mixed feelings, added transparency in the company and increasing openness at the executive level will mitigate remaining reservations in the U.S. The company's potential employment and investment effect are recognized, but they cannot happen at the cost of U.S. security. True, Huawei's customers have enjoyed generous credit lines, but then again Chinese companies and banks do not have access to multiple rounds of quantitative easing, minimal interest rates and ultra-generous loans. Like Sony in the 1980s, Huawei is moving rapidly toward innovation. While the U.S. government has gone too far and deployed anti-market interventions, the efforts by Huawei to comply reflect good will and good faith in the U.S. marketplace and could, ideally, provide blueprints for other companies in the struggle against cyber intrusions. Coming from the world's largest emerging economy, it is only natural that Huawei can and will use its cost advantage to its benefit, which actually works for U.S. consumer welfare as well. It is thus in the American interest to facilitate Huawei's entry into the U.S. marketplace.

Irrespective the official rhetoric, the security threat scenario appears to be the dominant approach currently. Based on unstated and unspecified charges, it is not persuasive and is likely to trigger adverse counter-measures over time.

Robust Security and Efficient Competition

In the case of Huawei in the United States, the tacit assumption is that sometimes robust security requires trade-offs that may result in inefficient competition. In contrast, *The Case of Huawei in America* has argued that, in the contemporary world driven by increasingly global technology innovation, robust security must be accompanied by

efficient competition. In this regard, Huawei's challenges in the U.S. precipitate inefficiencies that could one day compromise the nation's security.

Of course, open avenues for cross-border investment should facilitate favorable conditions for Chinese overseas investors. But research suggests that "for many reasons, when Chinese companies invest internationally, they face discrimination. This is particularly the case in the United States... [Chinese multinational corporations] face unusual scrutiny as potential foreign investors."¹⁶⁶ Appropriate scrutiny benefits all parties involved; inappropriate scrutiny is counter-productive. In the past five years, the Huawei saga in the U.S. has been comparable to an odd mix of Kafka's *The Trial* and *The Castle*. Not only has the company been targeted on the basis of allegations that remain unspecified, but the source and intermediaries of these charges are unstated. Unsurprisingly, Chinese and non-Chinese Huawei executives find the current status quo frustrating, which is reflected in the open letter by Huawei USA chairman Ken Hu:

In recent years, misperceptions and rumors have been the shadow of Huawei, affecting Huawei's reputation and, we believe, the United States government's judgment of Huawei. We sincerely hope that the United States government will address this issue by carrying out a formal investigation of any doubts it may have about Huawei in an effort to reach a clear and accurate conclusion.¹⁶⁷

A successful outcome in the Huawei case could prove a game-changer by accelerating investment flows into America at an historical moment when inward investment is needed the most. An unsuccessful outcome would have adverse implications in the U.S.-Chinese relations, far beyond Huawei. Political interference in investment decisions represents a divergence from the ideal of economic freedom and free markets. When governments respond in a mistaken way to these kinds of conflicts of priorities, it is likely to have an adverse impact on geopolitical relations going forward.

Huawei is facing resistance in the United States that goes beyond pure competition with its peers, or even traditional measures of political intervention in the market economy. In light of the currently disclosed evidence, the fears associated with Huawei's proposed investments in the U.S. are not only invalid, but could prove to be damaging to U.S. strategic interests in the nascent multipolar world. In the coming decade, more than \$1 trillion in direct Chinese investment will flow worldwide, a significant share of which could be destined for advanced markets, such as the United States.¹⁶⁸

Of course, *if* there truly is a security case to be made against Huawei, its senior executives or its products and services, then it should be made publicly, in a transparent and specific manner. Commercial gains do not justify compromised security. However, if that case does not exist or if it cannot be made, then there is a win-win case for Huawei in America – one that is in line with both U.S. interests and U.S. values.

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Appendix Huawei Operations Worldwide

North America

Huawei, a leader in providing next-generation telecommunications network solutions for operators around the world, established its North American headquarters in Plano, Texas, in 2001.

North America Operations

- 8 regional offices and 9 additional R&D centers
- More than 1000+ employees and actively recruiting
- Core businesses in mobile networks, core networks, optical networks, broadband access, and terminals
- Solutions deployed by
 - o Leap Wireless
 - o Cox Communications
 - o Telus
 - o Bell Canada
 - o Alltel
 - o Cleartalk
 - o Hibernia
 - o Level3
 - o MetroPCS
 - o One Communications
 - o Suddenlink
 - o T-Mobile
 - o Tyco Communications
 - o XO

Europe

Huawei established its first office in Europe in 2000, and since then, Huawei Europe has grown rapidly and continuously invests in local markets. Huawei Europe has a capable and professional team with over 3,000 employees, of whom approximately 60% are recruited locally.

Huawei Europe offers the most complete telecom product portfolio in the industry, covering mobile, broadband, core network, transmission network, data communication, value-added services, devices, and

professional services. Its products and solutions have been deployed throughout Europe for operators and customers including, British Telecom (BT), Deutsche Telekom, Vodafone, France Telecom/Orange (FT), Telefónica O2, Telecom Italia, Swisscom, Telenor, TeliaSonera, and KPN. It also has established innovation centers in cooperation with top operators in Europe.

Having a strong local presence is key strategies in maintaining sustainable development for Huawei Europe. Huawei has established extensive operations across Europe that encompass R&D, marketing, sales, distribution, and service networks.

Asia Pacific

Huawei is a leading global information and communications technology (ICT) solutions provider. Since 1997, the company has been serving the top telecom operators in the Asia Pacific region via its Carrier Network business group. More recently, Huawei launched its Device and Enterprise business groups, which serve Asian consumers and corporations, respectively.

Asia Pacific, excluding China, comprises 17%, or USD 5.5 billion of 2011 revenues.

Huawei has established four regional headquarters, 20 representative offices, two R&D centers and six training centers in Asia Pacific. The company has more than 12,000 employees in the region, 45% of whom are engaged in R&D, and 75% of whom were locally recruited. Huawei solutions are deployed by more than 60 operators in more than 20 countries in Asia Pacific.

Asia Pacific Customers Include

- Australia: Optus, Telstra, Vodafone
- Hong Kong: Hutchison, Genius
- India: Aircel, Bharti Airtel, BSNL, Idea, MTNL, Reliance, Tata

- Indonesia: Axis Telecom, Bakrie Telecom, HCPT (Tri), Indosat, Telkom, Telkomsel, XL Axiata
- Japan: eAccess, KDDI, NTT Docomo, Softbank
- Korea: Korea Telecom, SK Telecom
- New Zealand: 2degrees, Ultrafast Fibre
- Philippines: Bayantel, Globe, PLDT Smart
- Singapore: M1, Nucleus Connect, Singtel, Starhub
- Thailand: AIS, CAT, TOT, True

Africa

As a key global market, Huawei has established strategic partnerships with major telecom operators in Africa and is now one of the top three telecom equipment providers on the continent.

Since its entry in 1997, Huawei has established four regional headquarters, 20 representative offices, two R&D centers and six training centers across Africa. Huawei's fixed assets investment in Africa over the past decade has exceeded USD 1.5 billion.

As of January 2009, Huawei has more than 4,000 employees in Africa, 60% of whom are locally recruited.

Broad Product Portfolio

- Shared technical expertise with African carriers for more than 10 years
- Helped to create more than 10,000 jobs through collaboration with approximately 1,000 local sub-contractors
- Established six training centers in Africa that provide instruction to 12,000 students annually
- In 2009, Huawei invested USD 20 million to expand its training center in Egypt in order to provide training programs on the latest technology, including WCDMA, GSM, CDMA, NGN, Datacom, optical networks, broadband, and intelligent networks
- In 2008, local procurement from the African market totaled USD 480 million

Middle East

Huawei Middle East is headquartered in Bahrain. It has offices across 13 countries with over 2,800 employees, of whom 60% are local hires. It is most actively involved in Bahrain, Saudi Arabia, UAE, Qatar, Jordan, Oman, Kuwait, and Lebanon.

Huawei has invested considerable resources to consolidate its presence and establish a strong network with key operators, including Etisalat, STC (Saudi Telecom Corp), Zain, Batelco, du, Qtel, Mobily, Orange Telecom and Vodafone.

With an average annual sales growth of 50%, Huawei's contract sales across MENA in 2009 totaled USD 3.3 billion, compared to USD 2.9 billion in 2008.

Latin America

Huawei established its first office in Latin America in Brazil in 1999. Its headquarters is in Mexico City. It serves more than 50 operators with leading solutions including 3G, IMS, NGN, DWDM, GSM, application and software, WIMAX, and CDMA.

Latin America Operations:

- More than 4,500 employees, across 19 regional offices, 3 software R&D centers, and 3 training centers
- Solutions have been deployed by top operators including, America Movil, Telmex, Telefonica, Millicom, Nextel, TIM, Digitel, CANTV, CNT, and Entel
- Rank first in IP DSLAM solution and market share in Latin America
- Rank first in NGN application and market share in Latin America
- Rank second in Optical Network market share in Latin America
- Rank second in Router/LAN Switch Market (carrier market) in Latin America
- Implemented 3G UMTS projects in Brazil, Mexico, Argentina, Colombia, Venezuela, Chile, Peru, and Ecuador

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¹ See Prasso, S. 2011. “What Makes China Telecom Huawei So Scary?” *Fortune*, July 28.

² The survey went to dozens of telecom companies, software makers and information-security companies, including some foreign firms. The Commerce Department refused a request by the companies for specific protocols to protect the data.

³ Compare Riley, Michael. 2011. “Obama Invokes Cold-War Security Powers to Unmask Chinese Telecom Spyware,” *Bloomberg*, Nov 30.

⁴ “Our concerns are exacerbated by the fact that the department has chosen to direct the disclosure of this data pursuant to an assertion of authority under the Defense Production Act.” Quoted in Riley, Michael. 2011. “Obama Invokes Cold-War Security Powers to Unmask Chinese Telecom Spyware,” *Bloomberg*, Nov 30.

⁵ The Commerce Department survey also illustrates the intelligence community’s concern that manufacturers may insert spyware after equipment is installed, through either maintenance or automatic software updates. “It’s the update function that is the core of the concern,” said James Lewis of the Center of Strategic and International Studies (CSIS). *Ibid.*

⁶ “If the United States government has any real concerns of this nature about Huawei we would like to clearly understand those concerns, and whether they relate to the past or future development of our company. We believe we can work closely with the United States government to address any concerns and we will certainly comply with any additional security requirements. We also remain open to any investigation deemed necessary by American authorities and we will continue to cooperate transparently with all government agencies...” See “Huawei Open Letter,” Ken Hu, Deputy Chairman of Huawei Technologies, Chairman of Huawei USA, May 18, 2011.

⁷ Compare Riley. 2011. “Obama Invokes Cold-War Security Powers.”

⁸ The NCE report contends that “Chinese actors are the world’s most active and persistent perpetrators of economic espionage.” However, while US private sector firms and cybersecurity specialists have reported an onslaught of computer network intrusions that have originated in China, but the [intelligence community] cannot confirm who was responsible.” The NCE report notes that, of the seven cases that were adjudicated under the Economic Espionage Act— both Title 18 USC § 1831 and § 1832—in Fiscal Year 2010, six involved a link to China. The intelligence community has not been able to attribute many of these private sector data breaches to a state sponsor. See *Foreign Spies Stealing US Economic Secrets in Cyberspace: Report to Congress on Foreign Economic Collection and Industrial Espionage, 2009-2011*. Office of the National Counterintelligence Executive. October 2011, p. 5.

⁹ *Ibid.*

¹⁰ As so many times before and consistent with its cyber security policies, Huawei welcomed an investigation. Quoted in Riley. “Obama Invokes Cold-War Security Powers to Unmask Chinese Telecom Spyware.”

¹¹ The lawmakers asked both companies if they have “ever been ordered by the Chinese government to perform a task or seek information on behalf of the government?” They also asked the companies if any employees “ever attempted to obtain private information from an individual, company or government” through their company’s network or equipment.

¹² “I remain concerned about the national security threat posed by the potential expansion of Huawei and ZTE into our telecommunications infrastructure,” Rogers said in a statement. See also Strohm, C. 2012. “U.S. Lawmakers Expand Probe to Chinese Companies’ Dealings.” *Bloomberg News*, June 13.

2. *The Rise of Chinese Multinationals*

¹³ A modern multinational corporation has substantial direct investment in foreign countries and actively manages these operations, which are seen as integral parts of the company both organizationally and strategically.

¹⁴ International production by multinationals – that is, value added by their foreign affiliates – accounts for around 40% of multinationals' total value added, up from around 35% in 2005. See *The World Investment Report 2011 (WIR11): Non-Equity Modes of International Production and Development*. New York: UNCTAD.

¹⁵ On China's economic development and growth prospects, see Steinbock, D. 2010. "China's Next Stage of Growth: Reassessing U.S. Policy toward China," *American Foreign Policy Interests*, Vol. 32, Issue 6, Dec. 2010, pp. 347-362; Steinbock, D. 2012. "The Eurozone Debt Crisis: Prospects for Europe, China, and the United States," *American Foreign Policy Interests*, Vol 34, Issue 1, 2012, Jan. pp. pp. 34-42.

¹⁶ See IMF *World Outlook* and *Regional Outlook*.

¹⁷ See the long-term projections by the author, Goldman Sachs, Price WaterhouseCoopers, and Carnegie Endowment of International Peace.

¹⁸ See Steinbock, D. 2010, "The Rest and the West," *The Globalist*, May 12; Steinbock, D. 2010. "Europe's Debt Crisis," *The Globalist*, May 27.

¹⁹ See Steinbock, D. 2010. "China's Next Stage of Growth: Reassessing U.S. Policy toward China," *American Foreign Policy Interests*, Vol 32, Issue 6, Dec. 2010, pp. 347-362.

²⁰ On China's volatile property markets, see Steinbock, D. (2010), "China's World-Historical Urban Challenge: Balancing Sustainable Economic Growth and Soaring Property Prices," *NewGeography*, June 18. See also Steinbock, D. 2010. *Shanghai and Hong Kong and China's Global Financial Hubs*, Shanghai Institutes for International Studies, January.

²¹ Interview with Ross Gan, Worldwide Head of Huawei Corporate Communications, Shenzhen, China, April 24, 2012. All further quotes from Gan, unless otherwise attributed, are based on interviews conducted between May and July 2012.

²² *The World Investment Report 2011 (WIR11): Non-Equity Modes of International Production and Development* (New York: UNCTAD), p. 25-26.

²³ If the share of China (7%) would be augmented by that of Hong Kong (3%), its share would increase to 10% and that of the BRICs to 18%.

²⁴ Peter Williamson, P. and Zeng, M. 2007. *Dragons at Your Door: How Chinese Cost Innovation Is Disrupting Global Competition*. Harvard Business School Press.

²⁵ As BYD has found, this may require a dual business model –to make use of the low cost structure in China, and another to thrive in foreign environments.

²⁶ Based on the IMF figures (2010-2011).

3. *Huawei's Global Success*

²⁷ Ren named his company Huawei (Chinese: 华为). Of the two characters, one means "splendid" or "magnificent", but can also mean "China". The second character means "action" or "achievement". Combined, the two can be translated as "achievement", "magnificent act", or "China is able."

²⁸ The decision to work with Shanghai Bell, which was actually the technology centre in communication sector in 1990s in China, and the Center for Information Technology (CIT) brought Huawei much more technological knowledge and helped it finish a technological stage-skipping in telecom sector. Opting for rural markets was also Huawei's way to avoid direct competition with Shanghai Bell in 1990s.

²⁹ For a detailed study of Huawei's early development, see Cheng Dongsheng and Liu Lili. *Huawei zhenxiang* [The truth about Huawei]. Beijing: Dangdai Zhongguo chubanshe, 2003, p. 5.

³⁰ Li Cheng, "China's Telecommunications Industry on the Move: Domestic Competition, Global Ambition, and Leadership Transition," *China Leadership Monitor*, No 19, Fall 2006, p. 7.

³¹ Huawei also established joint ventures and other partnerships with local bureaus of posts and telecom. Though controversial, this practice allowed local governmental institutions promote the sale and maintenance of Huawei's telecom equipment, enabling those authorities to recoup much of their investment through annual dividends. See Wang Yukun, *Quanqiuhua zhi wu—Xianghai ersheng de Zhongguo qiye* [Dance with globalization: Overseas expansion of Chinese enterprises]. Beijing: Beijing Normal University Press, 2006, pp. 19–21.

³² Later that year, Huawei launched its wireless GSM-based products and eventually expanded to offer CDMA and UMTS.

³³ The "superstar" companies under state auspices and subsidies that have no competitors in the home market, very often end up with no ability to compete internationally."As we have learned from the growth of our own company," he wrote, "with economic globalization, competition in any industry will eventually become global." See Ren Zhengfei, "Openness, Competition and Collaboration." *European Competition Forum*. February 2, 2012

³⁴ Cheng and Liu, *Huawei jingying guanli zhihui*, pp. 5-9.

³⁵ In the next half a decade, Huawei contracted with IBM for management consulting, as it has over time with Pricewaterhouse Coopers, the Hay Group, and Towers Perrin.

³⁶ To protect Huawei, he sold off its non-core properties, including a California subsidiary, Avansys Power, to Emerson Electric for \$750 million. It was time to transform Huawei. It lacked a viable long-term strategy and organizational expertise.

³⁷ The agreement established the terms and conditions for the supply of Huawei's solutions to any one of the Vodafone operating companies worldwide.

³⁸ The contract focused on the deployment of BT's multi-service access network (MSAN) and Transmission equipment for its 21Century Network (21CN), providing BT and the UK telecom industry with infrastructure necessary to support future growth.

³⁹ These included UMTS/ HSPA in North America providing TELUS's new next generation wireless network and Bell Canada with high-speed mobile access. It delivered one of the world's first LTE/EPC commercial networks for TeliaSonera in Norway in 2009. It launched the world's first end-to-end 100G solution from routers to transmission system that same year. In May 2008, Huawei and Optus developed a mobile innovation center in Sydney, Australia, providing facilities for engineers to develop new wireless and mobile broadband concepts into "ready for market" products. Thereafter it invested around \$500 million to set up a telecom equipment manufacturing facility in Tamil Nadu, India and \$100 million to expand its R&D center in Bangalore.

⁴⁰ Huawei's vision is to enrich life through communication. Its mission is to focus on customers' market challenges and needs by providing excellent ICT solutions and services in order to consistently create maximum value for customers. Huawei's quality policy seeks to ensure that its customers' requirements and needs are identified and incorporated into its solutions. In turn, the quality policy is intertwined with Huawei's customer values.

⁴¹ Huawei continued to achieve rapid growth in Europe, America, and the CIS. Professional services in Europe grew more than 60%, and the consumer area of the U.S. market exceeded 100% growth for the second year in a row. Huawei also maintained momentum in the Asia-Pacific region thanks to growth in Hong Kong, Japan, Australia, New Zealand, and other APAC markets. Carrier network and consumer businesses showed strong growth in Latin America. There were steady increases in the Middle East and North Africa, and the market for broadband products in the UAE, Qatar, and other countries witnessed burgeoning growth.

⁴² “Huawei: The company that spooked the world,” *Economist*, Aug 4, 2012.

⁴³ “Chinese multinationals: Who’s afraid of Huawei?” *Economist*, Aug 4, 2012.

4. Corporate Governance

⁴⁴ This ownership structure is controlled by the company's management. Employees cannot buy shares, but are allocated shares annually on the basis of work performance, duties and capabilities for the position and on future development potential. Dividends are paid to employees, to complement Huawei's incentive scheme that includes performance bonuses and annual salary reviews. The shares themselves are known by the Huawei internal term "Virtual Restricted Shares", a technical name for otherwise normal shares.

⁴⁵ BOD guides and oversees the overall business operations and makes decisions on significant strategic issues.

⁴⁶ The key roles and responsibilities of the Supervisory Board include overseeing the company's financial and operational performance; monitoring the performance of BOD members, the Chief Executive Officer, and other senior management; and attending BOD meetings as non-voting participants. For more on Huawei's governance structure, see 2011 Annual Report, Huawei Investment & Holding Co., Ltd., p. 69.

⁴⁷ In the past year or two, more has been learned about the internal decision-making apparatus and process outside of Ren's role. The role and powers of the board have not been disclosed. Nor has there been public disclosure of the relations between the Huawei holding company (the shareholders union run by an undisclosed committee) and Huawei Technologies Inc.

⁴⁸ See for instance Saarinen, J. 2010. “Analysis: Who really owns Huawei?” iT News, May 28.

⁴⁹ However, since the company neglected to note that two board members are members of Ren's immediate family—his daughter and his brother— this disclosure fueled the kind of speculation that it hoped to mitigate. Meng Wanzhou, Ren's daughter, was chief financial officer, while Ren's younger brother, Ren Shulu, was appointed to the supervisory board in January 2011

⁵⁰ Huawei's rotating chairmanship program began after a “grueling” 2003 in which Ren said he was “exhausted” and suffered from “a number of diseases.”

⁵¹ Current CEO Xu Zhijun, who uses the English name Eric, was born in 1967, and holds a doctorate from Nanjing University of Science and Technology. Hu Houkun has a bachelor's degree from Huazhong University of Science and Technology in Wuhan. Guo Ping, Guo, born in 1966, has a Master's Degree from Huazhong University of Science and Technology.

⁵² Chu, C. and Huang, Y. 2011. “Huawei begins CEO rotation to pave management succession,” *China Daily*, December 29.

⁵³ “Private Chinese companies such as Huawei . . . represent the new digital triangle model, whereby the military, other state actors, and their numbered research institutes help fund and staff commercially oriented firms that are designated ‘national champions,’ receive lines of credit from state banks, [and] supplement their R&D funding with directed [targeted project] money. . . . [They] are genuinely commercial in orientation, seeking to capture domestic and eventually international market share.” In the early 1990s, Huawei received a boost from contracts to develop equipment for the PLA's first national telecom network. See Madeiros, E.S. et al. 2005. *A New Direction for China's Defense Industry* (Santa Monica, CA, and Washington, DC: Rand Corporation, 2005), especially Chapter 5.

⁵⁴ Steinbock, D. 2002. *Wireless Horizon: Strategy and Competition in the Worldwide Mobile Marketplace*. New York: Amacom, see esp. Chapters 4-6, 8, 11.

⁵⁵ Especially the Center for Information Technology, itself part of a larger research institute of the PLA, and two other research institutes maintained by the former Ministry of Post and Telecommunications.

⁵⁶ These IT companies further supplemented their R&D resources through support from other research programs, particularly the National Defense Program 863 (administered by the Ministry of Information Industry) that aimed to marry the latest university research with private commercial advances.

⁵⁷ Reportedly, similar debate has also involved the role of Ms. Sun Yafang, chairwoman of the board, who served as a captain in the People's Liberation Army and worked in the Ministry of State Security in telecommunications before joining Huawei in 1992.

⁵⁸ Ren Zhengfei. 2003. "My Father and Mother." Huawei company newsletter. December 10, 2003. [Ren's commemorative article of his parents and his upbringing (in Chinese)].

⁵⁹ As William Plummer notes, another Chinese company with a similar name was headed by a PLA officer and may have sold optical communications gear to Iraq under Saddam Hussein. The mixup erroneously became part of a *Wall Street Journal Asia* article in 2001 and was subsequently referenced by the 2006 Rand Report and has been falsely repeated ever since. See Prasso. "What Makes This Chinese Telecom Company So Scary?"

⁶⁰ With the economic reforms since the 1980s and China's membership in the World Trade Organization in 2001, the role of business executives in the party has increased, along with the number of people that belonged to the "wavering middle." In both cases, the Party has become more open to business leaders and Chinese middle class.

⁶¹ See also *Lee Chyen Yee. 2012. "At Huawei, an Eccentric Force Drives the Company Forward," Reuters, April 24.*

5. Credit Controversies

⁶² For a detailed study of Huawei's early development, see Cheng Dongsheng and Liu Lili. *Huawei zhenxiang* [The truth about Huawei]. Beijing: Dangdai Zhongguo chubanshe, 2003, p. 25.

⁶³ Compare Peilei Fan, "Catching up through Developing Innovation Capability: Evidence from China's Telecom-Equipment Industry," *Technovation*, No. 26 (2006): 363. In the past three decades, China has benefited from economic reforms. Financial reforms have been accelerating only in the 2010s. See Steinbock, D. 2012. "From Economic Reforms to Financial Reforms in China," *China-US Focus*, May 25.

⁶⁴ "The Huawei Way", *Newsweek*, January 15, 2006.

⁶⁵ Jonathan Stearns, "China Modem Makers May Face EU Anti-Subsidy Tariff," *Bloomberg*, September 16, 2010.

⁶⁶ According to Option SA's complaint, the companies received beneficial financing arrangements from Chinese state banks, which included Huawei signing a cooperation agreement in September 2009 with the China Development Bank (CDB) worth \$30 billion. See Matthew Dalton, "Europe Raises Cry Over China Tech Exports," *Wall Street Journal*, October 5, 2010

⁶⁷ Hu, "Huawei Open Letter."

⁶⁸ As an intermediary, the company recommends loans to its customers and, once taken, those customers are responsible for paying the principle and interest directly to these banks. These types of loans represented less than 9% of Huawei's annual income in 2010; a level that the company says is similar to its industry peers.

⁶⁹ *Ibid.*

⁷⁰ Export-Import Bank of the United States, *2010 Competitive Report* (Washington, DC: Author, 2010), 113.

⁷¹ Hochberg said, "One of the central reasons [Huawei's] growth is so strong is they're backed by a \$30 billion credit line from the Chinese Development Bank." See Hochberg concluded his remarks with a warning, saying we will "send a clear message to China . . . we are not going to sit by idly and play by a certain set of rules that other countries don't play by." See Fred Hochberg, "How the US Can Lead the World in Exports: Retooling Our Export

Finance Strategy for the 21st Century,” Presentation at the Center for American Progress, Washington, DC, June 15, 2011.

⁷² On August 9, 2011, five members of Congress signed a letter to the secretaries of Defense and Energy and the chairwoman of the SEC protesting an award by a University of Tennessee computer engineering center to a company that would utilize Huawei security technology. See Letter from Senators Jon Kyl (R-AZ), James Imhofe (R-OK), Tom Coburn (R-OK), and James DeMint (R-SC), and Rep. Sue Myrick (R-SC) to Secretary of Energy Steven Chu, Secretary of Defense Leon Panetta, and Securities and Exchange Commission chairwoman Mary Shapiro, Washington, DC, August 9, 2011. According to congressional staff, the objective of the letter was for the contract to be rescinded: for details, see Lake, E. 2011. “Computer Lab’s Chinese-Made Parts Raise Spy Concerns,” *Washington Times*, August 16.

⁷³ Robert Olsen, “Huawei’s Open Letter to US Investigators,” *Forbes*, February 24, 2011.

⁷⁴ Barfield argues that it is increasingly likely that the United States and the EU will take unilateral countervailing duty actions against Huawei (and ZTE) if China continues to provide large-scale export credit subsidies to their customers. Alternatively, they could bring a WTO case charging violation of China’s obligations under the WTO subsidy code. “Even as a tactical move, this would be unwise, particularly in light of the PRC’s announced goal of huge increases in outward investment,” Barfield concludes. See Barfield, *Telecoms and the Huawei Conundrum.*, pp. 21-22.

⁷⁵ Compare Hochberg, “How the US Can Lead the World in Exports: Retooling Our Export Finance Strategy for the 21st Century.”

⁷⁶ Ex-Im Bank estimates that in 2011 there was roughly \$100 billion in unregulated OECD export financing and an additional \$60 billion from Brazil, India, and China. See Export-Import Bank of the United States, *2011 Competitive Report* (Washington, DC, 2010). See also Hochberg, F. 2012. “Ex-Im Bank Chairman Says American Businesses Can Successfully Compete Against Foreign Companies, Not Countries.” Export-Import Bank of the United States, June 25.

6. Huawei’s Expansion Efforts in America

⁷⁷ Rosen, D.H. and Hanemann, T. 2011. *An American Open Door? Maximizing the benefits of Chinese Foreign Direct Investment.* Asia Society and Kissinger Institute on China and the United States. May.

⁷⁸ “I couldn’t speak good English, didn’t know how to drive,” recalls Chen. “We started from our apartment, maybe four or five people, and we had no clue. To understand the market, to set up a strategy, was very hard.” See Prasso, S. 2011. “What Makes China Telecom Huawei So Scary?” *Fortune*, July 28.

⁷⁹ In 2005, Huawei began a joint venture with Siemens for developing 3G/ TD-SCDMA mobile communication technology products. In 2006, Huawei established a Shanghai-based joint R&D center with Motorola to develop UMTS technologies. That year Huawei also established a joint venture with Telecom Venezuela for R&D and sale of telecom terminals. In 2007, after Nokia and Siemens co-founded Nokia Siemens Networks, Siemens transferred all shares it held in TD Tech to NSN. In 2008, Huawei launched a joint venture with UK-based marine engineering company, Global Marine Systems, to deliver undersea network equipment and related services.

⁸⁰ Sprint’s senior vice president of network, Bob Azzi, who made the contract decision, wouldn’t acknowledge that Huawei had been a bidder. He says there are many costs to consider in an upgrade -- including transitioning to a new technology -- but that a warning from the Secretary of Commerce wasn’t one of them. “I was not told what to do,” he insists. “The bottom line is we made the choice in the business context we had. We decide on the costs; we decide on the benefits. Period.” *Ibid.*

⁸¹ “In my view it was a serious mistake for America not to [have had Sprint award Huawei the business],” says Owens. “They’re opening all their source code to Sprint, to the U.S. government, to everyone. At Nortel, I never

would have opened the source code to anyone, especially not the U.S. government. This is so compellingly wrong in the way this has happened." *Ibid.*

⁸² But as Huawei USA Chairman Ken Hu acknowledged: "We originally decided to decline the offer with an intention to go through all of the procedures to reveal the truth about Huawei. However, the significant impact and attention that this transaction has caused were not what we intended, and on February 18, we decided to accept the recommendation of CFIUS to withdraw our application to acquire specific assets of 3Leaf. See Hu, "Huawei Open Letter."

⁸³ *Ibid.*

⁸⁴ Leap first purchased Huawei's 3G equipment in 2006, then base stations in 2007, and modems in 2010. Currently it sells Huawei's affordable Android-based smartphone, the Ascend. T-Mobile offers the Huawei Ascend as well.

⁸⁵ See Prasso, S. 2011. "What Makes China Telecom Huawei So Scary?" *Fortune*, July 28.

⁸⁶ Reinhardt Krause. "Took Time, But Finally Tech Jobs Are Rising". *Investor's Business Daily*. Archived from the original on 2007-02-12. Retrieved 2007-01-31.

⁸⁷ ^ North Central Texas Council of Governments 2030 Demographic Forecast (+ relative historical census data) entry for Telecom Corridor. Retrieved 22 January 2006.

⁸⁸ R&D (wireless technology, optical transport and broadband networks) and human resources are based at the nearby Plano facility. Regional sales offices, and additional R&D centers, are strategically located throughout the U.S. Dedicated support offices are located in proximity to key customer headquarters. Huawei utilizes channel marketing, OEM and ODM to distribute and support its products.

⁸⁹ See *Emerging Best Practices of Chinese Globalizers: The Corporate Global Citizenship Challenge*. World Economic Forum in collaboration with the Boston Consulting Group, March 2010, p. 15.

⁹⁰ Huawei's European clients expected the company to take the lead in promoting the corporate citizenship concept along the entire IT value chain, to improve CSR awareness and drive greater improvements. As a result, Huawei has organized CSR training for its own suppliers since 2000. Today, it is seen as a benchmark model for industry firms. *Ibid.*, p. 16.

7. Competitiveness

⁹¹ Huawei's SingleRAN equipment, for example, can handle multiple types of signals - 2G, 3G, WiMax, CDMA, GSM - on one box, freeing a carrier from building separate networks. See Prasso, S. 2011. "What Makes China Telecom Huawei So Scary?" *Fortune*, July 28.

⁹² Chambers made the comment at a Wall Street Journal event, which virtually ensured broad coverage in the U.S. See Clark, D. 2012. "Cisco CEO Wary of Huawei," *Wall Street Journal*, April 6

⁹³ Garling, C. 2012. "HP, Cisco, Sun Gear Surfaces Inside Iranian Mobile Operator," *Wired*, June 5.

⁹⁴ "Huawei: The company that spooked the world," *Economist*, Aug 4, 2012.

⁹⁵ "Layoffs Won't Solve Cisco's Problems," *Seeking Alpha*, July 12, 2011.

⁹⁶ "Successful companies try to cannibalize themselves before someone else does it. But Cisco is king of the hill and defending its territory by offering incrementalism." See Bort, J. 2012. "Cisco's Real Problem Is Way Bigger Than Europe," *Business Insider*, May 11.

⁹⁷ Interview with John Ruese, Huawei's R&D chief in North America. All further quotes from Ruese, unless otherwise attributed, are based on interviews conducted between May and July 2012.

⁹⁸ “Stellar growth sees China take 27% of global smart phone shipments, powered by domestic vendors,” *Canalys*. Aug 2, 2012. During the past half a decade, the once-dominant market shares of Nokia and RIM have collapsed, while HTC’s sales have tumbled. Motorola Mobility has been acquired by Google. Sony and LGE have fallen behind. Until recently, Apple and Samsung dominated 54 percent of the global marketplace.

⁹⁹ “Until now, it’s sold handsets costing less than \$200 to carriers such as MetroPCS and Cricket that offer pay-as-you-go plans, mostly to lower-income consumers. Last November it landed a deal with a top-tier U.S. carrier when AT&T (T) started selling Huawei’s Impulse phone for \$29. On July 11, T-Mobile announced that Huawei would be building two models in the carrier’s MyTouch line of handsets. See Burrows, Peter. 2012. “The New Smartphone Powerhouse: Huawei,” *Bloomberg Businessweek*, July 19.

¹⁰⁰ On the weaknesses of Apple in the global smartphone market and Nokia’s strategic challenges, see Steinbock, Dan. 2010. “Smartphone Rivalries: Apple’s Global Challenges,” *The Globalist*, August 10; “Apple Vs Nokia: 2010. “The Smartphone Rivalry,” *The Globalist*, August 9; 2010. “Apple iPhone4 Success Masks Global Strategic Challenges,” *Harvard Business Review*, June 2. On the rise of Nokia and the mobile industry, see Steinbock. 2010. *Winning Across Global Markets*; 2002. *Wireless Horizon*; 2001. *The Nokia Revolution*.

¹⁰¹ As the product matures and becomes more of a commodity, the number of competitors increases. In the end, the product is produced either by competitors in lesser developed countries or, if the innovator has developed into a multinational manufacturer, by its foreign-based production facilities. This model was first conceptualized by Raymond Vernon in Harvard Business School and J.F. Kennedy School of Government in the mid-1960s. See Vernon, Raymond (1966). International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics*, Vol. 80, No. 2 (May, 1966), pp. 190-207

¹⁰² See Steinbock, D. 2010. *Winning Across Global Markets: How Nokia Creates Strategic Advantage Worldwide*. New York: John Wiley.

¹⁰³ Coming from tiny home bases, the Nordic giants, Nokia and Ericsson, had few other options. In contrast, Huawei comes from a huge market, but even it had to grow outside the major urban centers.

¹⁰⁴ The concept of the ecosystem first appeared in Harvard Business Review in May/June 1993, and won Moore McKinsey Award for article of the year. See Moore, James F. (1996). *The Death of Competition: Leadership & Strategy in the Age of Business Ecosystems*. New York: HarperBusiness, p. 26.

¹⁰⁵ The same goes for ICT trendsetters such as Nicholas Negroponte, Henry Chessborough, Martha Russell of Stanford, Joi Ito of MIT MediaLab, and Dr Hossein Eslambolchi.

¹⁰⁶ Prior to joining Huawei, Roese spent 20 years serving as the chief technology officer of four large telecom and IT corporations, including Nortel, Broadcom, Enterasys and Cabletron. Roese has also served as chief marketing officer and chief information officer for several publicly-traded companies.

¹⁰⁷ When Roese served as advisor to the President’s National Security Telecommunications Advisory Committee (NSTAC) five years ago, the number one topic was the lack of robust security in the supply chain. It is a critical global problem but he believes it can be resolved in a way that the point of origin no longer matters.

8. Innovation

¹⁰⁸ In Bangalore, Huawei has more than 2,300 R&D people; it is the company’s largest R&D center outside China, focusing largely on software development. The company also has a lot of talent in Sweden, which has a great ecosystem of wireless talent, due to the historical presence of Ericsson. But Huawei also has microwave R&D in Milan, and in 2011, it launched a design center for handheld phones in the UK.

¹⁰⁹ Reverse innovation is a term referring to an innovation likely to be used first, in the developing world before spreading to the industrialized world. Reverse innovation refers broadly to the process whereby goods developed as

inexpensive models to meet the needs of developing nations, such as battery-operated medical instruments in countries with limited infrastructure, are then repackaged as low-cost innovative goods for Western buyers. See Govindarajan, V., Trimble, C. and Immelt, J.R. 2009. "How GE is Disrupting Itself." *Harvard Business Review*. October 2009.

¹¹⁰ Huawei has also been at the forefront of innovation in the network equipment space. It was the first vendor to commercially deploy a software-defined-radio (SDR) GSM/UMTS network in Europe for TeliaSonera in Finland in June 2009.

¹¹¹ According to International Data Corporation (IDC), China's share of the global smartphone market rose to 20.7% in 2011 while the U.S. share of the world's smartphone market is expected to decline to 20.6% in 2012. The innovation lead of western vendors in the handset space is about to be challenged once again by developing market vendors such as Huawei and others.

¹¹² "Report: China Overtook U.S. to Become World's Largest Smartphone Market," *Caijing*, June 14, 2012.

¹¹³ Roese oversees the company's overall R&D activities and establishes the direction for products and devices relating to wireless, wire line, core network, silicon development, terminals, software, and solutions.

¹¹⁴ Interview with John Roese. Prior to joining Huawei, Roese spent 20 years serving as the chief technology officer of four large telecom and IT corporations, including Nortel, Broadcom, Enterasys and Cabletron. Roese has also served as chief marketing officer and chief information officer for several publicly-traded companies. He is a published author, holder of 18 pending and granted patents in areas such as policy based networking and location-based services.

¹¹⁵ In terms of revenues, the carriers, consumers and enterprises represent about 70%, 20% and 5%, respectively. In terms of growth, the situation is almost reverse. Growth in enterprise services exceeds 50%, in consumer services 30% and carrier services 5%.

¹¹⁶ Interview with Song Liuping, Chief Legal Officer & President of Corporate Legal Affairs Department for Huawei. All further quotes from Song, unless otherwise attributed, are based on interviews conducted between May and July 2012. In his past role as director of Huawei's patent committee and a core member of the pre-study standard patent management team, Song also led significant IPR negotiations and cooperation projects between Huawei and key telecom solutions providers. In his current role, he is responsible for managing the company's legal functions, including IPRs and commercial agreements. He has led numerous intellectual property acquisitions, joint ventures between Huawei and its partners, and continues to play a key role in IPR negotiations.

¹¹⁷ In February 2003 Cisco Systems sued Huawei Technologies for allegedly infringing on its patents and illegally copying source code used in its routers and switches. According to Cisco, Huawei removed the contested code, manuals and command-line interfaces and the case was subsequently dropped, in July 2004. Afterwards, both claimed success. Cisco asserted that the "completion of lawsuit marks a victory for the protection of intellectual property rights", whereas Huawei's partner 3Com (which was not a part of lawsuit) noted that court order prevented Cisco from bringing another case against Huawei asserting the same or substantially similar claims. Compare "Cisco's motion for preliminary injunction". Cisco.com. 5 February 2003. See also Flynn, L. J. (29 July 2004). "Technology briefing: Cisco drops Huawei suit". *The New York Times*.

¹¹⁸ Hu, "Huawei Open Letter."

¹¹⁹ In January 2011, Huawei filed a lawsuit against Motorola to prevent its intellectual property from being illegally transferred to Nokia Siemens Networks as part of NSN's US\$1.2 billion acquisition of Motorola's wireless network business. In April 2011, Motorola and Huawei entered into an agreement to settle all pending litigation, with Motorola paying an undisclosed sum to Huawei for the intellectual property that would be part of the sale to NSN.

¹²⁰ Hille, Kathrin (28 April 2011). "Huawei sues ZTE over patents." *The Financial Times*.; "ZTE sues Huawei in China for patent infringement over 4G tech". Reuters. 29 April 2011.

¹²¹ Huawei has been awarded 23,522 patent licenses, 90% of which are invention patents. With regard to cloud computing technologies, Huawei possesses 685 patents in China, 226 in Europe, and 107 in the U.S.

¹²² Hu, “Huawei Open Letter.”

¹²³ Interview with Richard Brennan, Vice Director of Industry Standards at Huawei. All further quotes from Brennan, unless otherwise attributed, are based on interviews conducted between May and July 2012. Brennan has more than 40 years of telecommunications experience and has been actively promoting interoperability and global standards for over 15 years. Prior to joining Huawei in 2007, he managed California Silicon Valley start-ups and pre-IPO companies. He was also with AT&T for many years, where he was involved in network design and applications development and was awarded the AT&T President's Award for highest sales achievement.

¹²⁴ By the end of 2011, Huawei had joined 130 industry standards organizations (e.g., 3GPP, IETF, ITU, OMA, ETSI, IEEE, and 3GPP2). In total, Huawei has submitted more than 28,000 proposals to these standards organizations and has served as a board member for OMA, CCSA, ETSI, ATIS, and numerous other authoritative organizations in which it holds more than 180 positions.

¹²⁵ LTE is based on the GSM/EDGE and UMTS/HSPA network technologies, increasing the capacity and speed using new modulation techniques.

¹²⁶ In addition, it led the establishment of the ARDM work group in the cloud computing/data center sector for the IEFT and has served as the chair for the group. The company also extensively participates in cloud computing standards organizations.

¹²⁷ From the 1980s to early 1990s, the U.S. companies and operators dominated the analogue cellular (1G) standards. As industry competition globalized, the large emerging economies, in particular China and India, have had a steadily-increasing role in international standards as well. See Steinbock, *Wireless Horizon*.

¹²⁸ In these rivalries, the impact of the U.S. is unique in that there are many *de facto* standards that are not a result of international agreements and cooperation, but of individual technology companies and specific interest groups. As Brennan puts it, “These *de facto* standards are a challenge to all companies.”

¹²⁹ Huawei’s “Phone Lady” innovation is such an example in both emerging markets and mature economies, respectively. Huawei partnered with local housewives to introduce ICT service in the rainforests of Bangladesh. Information and communications technology (ICT) solutions provider Huawei wanted to expand into Bangladesh, which it identified as an emerging market that lacked mobile phone coverage. See *Emerging Best Practices of Chinese Globalizers*, p. 19.

9. Network Security

¹³⁰ “Sharp increase in cyberattacks on U.S. critical infrastructure,” Homeland News Wire, July 3, 2012. The finding was based on a report from the U.S. Industrial Control System Cyber Emergency Response Team (ICS-CERT). In more than half of the most serious cases, implementing best practices such as login limitation or properly configured firewall would have deterred the attack, reduced the time it would have taken to detect an attack, and minimize its impact.

¹³¹ “Infrastructure protectionInfrastructure security market to reach \$32.55 billion in 2012,” Homeland News Wire, July 3, 2012. These findings are based on Visiongain’s report, titled “The Infrastructure Security Market 2012-2022: Government Spending for Homeland Security.”

¹³² At Huawei, the cyber security assurance system permeates all business domains and departments, including R&D, supply chain, marketing, sales, engineering delivery, and technical services.

¹³³ Suffolk’s collaborative, open and transparent approach with a results driven focus has helped him win the best UK Company for customer excellence, his work has been a winner of the best retail financial services transformation program; and he has been IT innovator of the year. He has also been voted the most influential CIO by CBS.

¹³⁴ Suffolk is credited with driving the most dramatic change across the UK public sector, bringing together central (federal), regional and local government into delivering a citizen and business transformation agendas across the entire sector of 5.5 million people and serving 60 million UK citizens. See Mark Palmer and Paul Taylor, "Huawei Hires Former Head of UK IT Projects," *Financial Times*, August 1, 2011.

¹³⁵ Among other things, Suffolk was banned for two years from taking part in any projects for Huawei which would lobby any British Government departments for business. A Cabinet Office spokesman was keen to add that an "unprecedented number of conditions" are attached to Suffolk's appointment.

¹³⁶ Huawei leveraged quality management to enhance cyber security in its process management system, business decision-making system, and even to its employee business conduct guidelines.

¹³⁷ At the invitation of the British Foreign & Commonwealth Office, Huawei also attended the London Conference on Cyberspace in late 2011 to participate in dialogue on cyber security with industry peers.

¹³⁸ Mazur, P. (2012) "Eight Questions: David Wolf Makes the Connection," Wall Street Journal China, April 11. See also Wolf, D. (2012) *Making the Connection: The Peaceful Rise of China's Telecommunications Giants*.

¹³⁹ "Chinese tech giant calls for..."

¹⁴⁰ At a basic level, the concern is that an adversary may sabotage, maliciously introduce unwanted functions, or otherwise subvert the design, integrity, manufacturing, production, distribution, installation, operation, or maintenance of a system in order to conduct surveillance or to deny access to, disrupt, or otherwise degrade its reliability or trustworthiness. See, for example, the Ike Skelton National Defense Authorization Act for Fiscal Year 2011, H.R. 6523, 111th Cong. § 806(e)(4) (2011) (definition of "Supply Chain Risk").

¹⁴¹ Interview with John Suffolk, Huawei's Global Cyber Security Officer. All further quotes from Suffolk, unless otherwise attributed, are based on interviews conducted between May and July 2012.

¹⁴² Scott Charney, Eric T. Werner. 2011. *Cyber Supply Chain Risk Management: Toward a Global Vision of Transparency and Trust*. Microsoft Corporation. July 26, 2011.

¹⁴³ In that regard, supply chain efforts must be (1) risk-based, utilizing collaboratively developed standards; (2) transparent; (3) flexible; and (4) reciprocal. Additionally, the public-private partnership should create an agreed-upon framework for managing supply chain risk at a tactical level. *Ibid*.

¹⁴⁴ *Ibid*.

¹⁴⁵ Any Huawei customer can take advantage of EWA's vetting as part of a "trusted delivery" purchase of Huawei equipment. Still, Lindquist concedes, "nothing is 100% fail-safe." While security experts say the real vulnerabilities come not when the equipment is delivered but perhaps six months later when a patch or update is required, Lindquist says ongoing monitoring looks in on patches after the fact. "I'm very confident we'll find anything that's there," he says. See Prasso, S. 2011. "What Makes China Telecom Huawei So Scary?" *Fortune*, July 28.

¹⁴⁶ *Ibid*.

¹⁴⁷ "Chinese tech giant calls for cyber cooperation," MSNBC, June 23, 2012.

¹⁴⁸ "America is the biggest provider of components to Huawei. Don't believe anybody, I say. We have to check everything." Inside the organization, he reminds people: "Don't assume Huawei is safe. Don't believe when we say we are safe. Check everything we do. That's something we should say to our customers and governments as well." *Ibid*.

¹⁴⁹ The list is informed by DSD's experience in operational cyber security, including responding to serious cyber incidents and performing vulnerability assessments and penetration testing for Australian government agencies.

¹⁵⁰ "We are lazy when it comes to the basics," says Suffolk. "So the question to the governments is: 'Do you *really* care about cyber security?' If only these four very basic strategies were mandated at the federal level, state-level, in major cities, basic and critical industries."

10. Conclusions

¹⁵¹ Trade openness is often measured by exports plus imports as percentage of GDP. In China, that share is two times higher than in Japan (or the United States).

¹⁵² Huawei contends it operates like any other private corporation and that it is financed through capital from its shareholders and through normal commercial loans. However, Huawei's executives acknowledge that, like many other companies that operate in China, it receives tax incentives provided by the Chinese government to high-tech enterprises and support for some of its R&D initiatives. In 2010, Huawei received a total of RMB 593 million (\$89.8 million) of financial support from the Chinese government for its R&D activities.

¹⁵³ *Faces of Chinese Investment in the United States*. U.S. Chamber of Commerce. 2012.

¹⁵⁴ *Ibid*, p. 1.

¹⁵⁵ As the WEF noted in March 2010, "the localization rate among Chinese companies is significant: for example, more than 60% of overseas employees in ICBC, China National Petroleum Corporation, Huawei and ZTE are local residents, many of whom are mid- to high-level managers in the overseas branches." See *Emerging Best Practices of Chinese Globalizers*, p. 9.

¹⁵⁶ See Rosen, D. H. and Hanemann, T. 2011. *An American Open Door*. Asia Society. May.

¹⁵⁷ "If politicization is not tempered, the benefits of increased inward investment increasingly will be diverted to our competitors." *Ibid*, p. 72.

¹⁵⁸ The relevant statutes authorize the President to investigate foreign acquisitions, mergers and takeovers, and even asset purchases of U.S. companies, and where necessary, suspend or prohibit any foreign acquisition for national security purposes.

¹⁵⁹ See Jackson, J.K. 2010. *The Committee on Foreign Investment in the United States (CFIUS)*. Congressional Research Service, RS22863. March 30, 2011.

¹⁶⁰ In the first session of the 110th Congress, the House and Senate adopted S. 1610, the Foreign Investment and National Security Act of 2007. On July 11, 2007, the measure was sent to President Bush, who signed it on July 26, 2007. It is designated as P.L. 110-49. On January 23, 2008, President Bush issued Executive Order 13456 implementing the law. The Executive Order also established some caveats that may affect the way in which the law is implemented.

¹⁶¹ Jackson, J.K. 2010. *The Committee on Foreign Investment in the United States (CFIUS)*.

¹⁶² In July 2007, Congress asserted its own role in making and conducting foreign investment policy when it adopted and the President signed P.L. 110-49, the Foreign Investment and National Security Act of 2007. This law broadens Congress's oversight role, and it explicitly includes the areas of homeland security and critical infrastructure as separately identifiable components of national security that the President must consider when evaluating the national security implications of a foreign investment transaction.

¹⁶³ As Claude Barfield of the American Enterprise Institute (AEI) has argued: "For the US government, the least defensible actions regarding Huawei have been the *ex parte* interventions to prevent US companies from granting contracts to the company (or, by implication, any other Chinese company) for key portions of the telecommunications sector. Threatening phone calls from the Secretary of Commerce or the head of the National Security Agency contradict and vitiate US demands that other countries adhere to the rule of law and due process." See Barfield, C. 2011. *Telecoms and the Huawei Conundrum: Chinese Foreign Direct Investment in the United States*. AEI Economic Studies, November, p. 18.

¹⁶⁴ Derek Scissors, "Upgrading Trade Transparency," *The Foundry: Conservative Political News*, November 8, 2010.

¹⁶⁵ A number of intelligence officials from several administrations have acknowledged that, in the words of former NSA and CIA director Michael Hayden, information on cyber threats is “overprotected.” Quoted in Dean Cheng and Derek Scissors, “China and Cybersecurity: Trojan Chips and US–Chinese Relations,” Heritage Foundation WebMemo, May 5, 2011, 2,

¹⁶⁶ Guoqiang, L., Zadek, S. and Wickerham, J. 2010. *Advancing the Sustainability Practices of China’s Transnational Corporations*. International Institute for Sustainable Development, March, p. 16.

¹⁶⁷ Hu, “Huawei Open Letter.”

¹⁶⁸ See Rosen, D. H. and Hanemann, T. 2011. *An American Open Door*. Asia Society. May.