Optimal Investment Conditions for ICT and Technology

TFMA: Seizing Global Trade Opportunities and Minimizing Global Trade Threats

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Version: V2.0 (2017.08.07)

HUAWEI TECHNOLOGIES CO., LTD.

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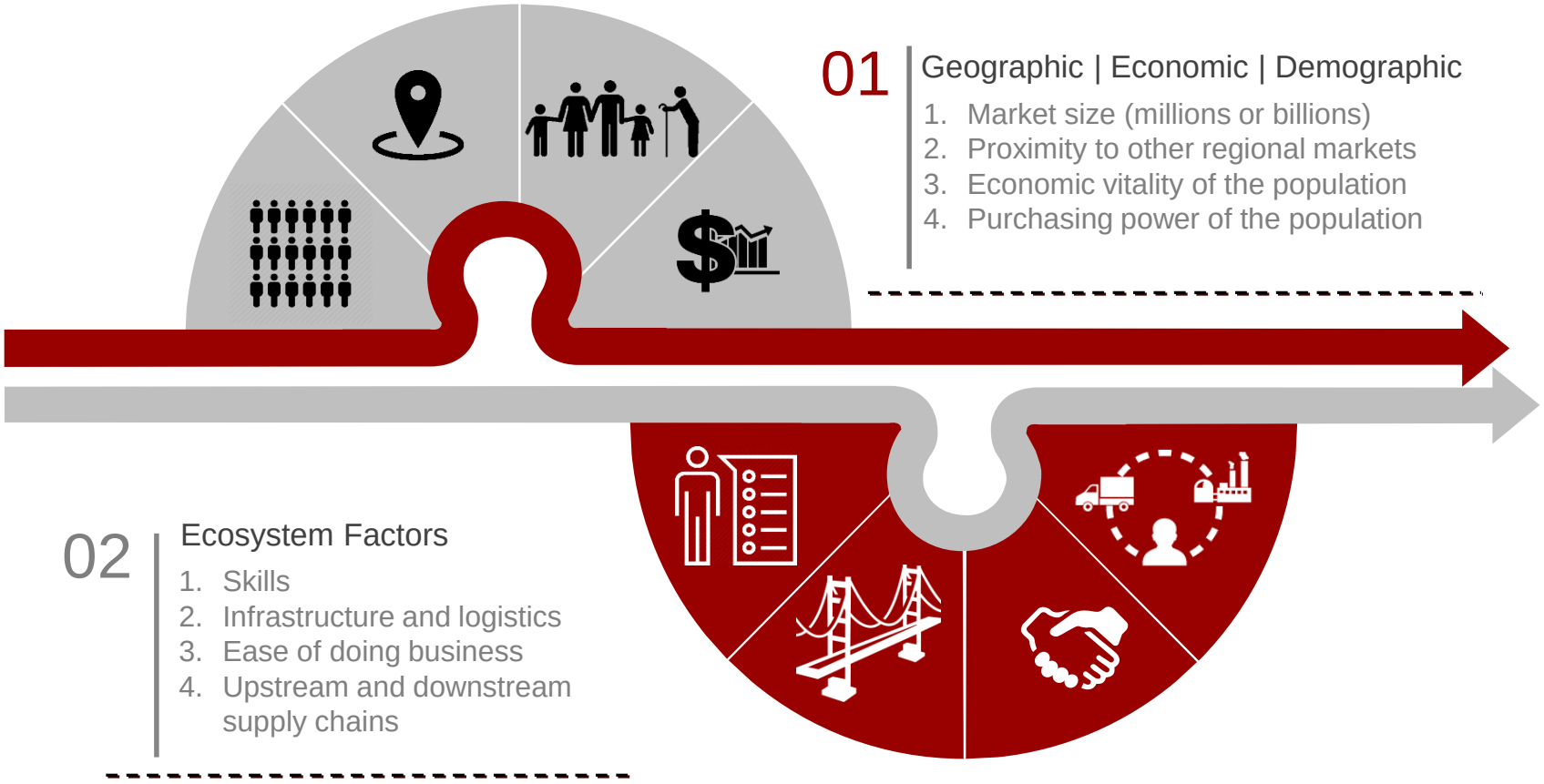
Outline

1. What Factors Attract and Repel?
2. ICT Infrastructure | Digital Economy
3. When Huawei Invests
4. Conclusions

What Factors Attract?

Some factors are within and some beyond the control of policymakers



01

Geographic | Economic | Demographic

1. Market size (millions or billions)
2. Proximity to other regional markets
3. Economic vitality of the population
4. Purchasing power of the population

02

Ecosystem Factors

1. Skills
2. Infrastructure and logistics
3. Ease of doing business
4. Upstream and downstream supply chains

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What Factors Attract?

Ecosystem factors and amenable policy interventions

Skills	Infrastructure	Business Climate	Up/downstream
			
Policy interventions	Policy interventions	Policy interventions	Policy interventions
Mandatory primary and secondary education for all	Infrastructure strategic vision with project pipeline	Reduce regulatory and compliance burden to the minimum necessary	Strategic medium to long term industrial policy vision for targeted clusters
Technical education with focus on STEM	Governance and contract mechanisms to reduce renegotiation risk	Independent, well-trained, and adequately-resourced judiciary	Tax breaks and incentives to foster specific sectoral value chains
Vocational colleges and apprenticeship programs	Transparent and predictable procurement, permitting and tax regimes	Highest-level political commitment to reduce corruption across the public service	Targeted interventions to develop and foster talent pools with local tertiary institutions
Immigration policies to attract the right skills from abroad	Contract mechanisms to hedge against currency risks	Commitment to open and contestable markets for all goods and services	Special economic zones with lower regulatory burdens and more open labor markets
Open education services markets	Possibility to resolve any disputes through international arbitration	Commitment to improving ranking on WB's Ease of Doing Business survey	Ease trade restrictions and lower trade costs (logistics) for importers and exporters in targeted sectors

What Factors Attract?

Some Examples from US Manufacturing Companies

The Big Three Issues: skills, Infrastructure (transport/logistics), regulatory compliance

GRADALL INDUSTRIES, INC.
Where Ingenuity Works

Gradall employs 400 people in an entirely unionized workforce in a single facility in Ohio, where it manufactures Gradall excavators and Vacall vacuum and jetting machines.

All its manufacturing is done domestically, and more than 80% of its sales stay within North America.

Its supply chain has diversified globally over the years, but some purchases remain local, such as steel.

(In this industry) "You live and die by new production and new developments" – Mike Haberman, president

"Hiring has become a challenge. Skill sets are drastically different with respect to technology. If trade schools aren't staying current with technology, you have a really hard time hiring good people."

"Logistics are an advantage for domestic manufacturing. When you're talking logistics, you need to talk infrastructure. As our infrastructure ages, that's going to get more difficult. The entire economy is based on free movement."

Workforce: "We as a country need to stay ahead of the curve on workforce. If we want manufacturing to stay and thrive in this country, we need to stay up-to-date on workforce and development."

Kubota

Kubota manufactures machinery and equipment, including a full line of tractors, and is headquartered in Texas, where it moved from California in response to lower tax rates and the availability of skilled labor. Kubota also has a significant employment impact through its 1,100 dealerships scattered across the nation. Its primary production facilities are in Gainesville and Jefferson, Georgia. Its Lincolnshire, Illinois plant makes OEM engines for all of its product lines.

Skilled labor shortages are a key concern. "We have an internship program, where it allows engineers to work over the summer, and it offers them jobs at the conclusion of the program." – Todd Stucke, Vice President. Finally, Kubota also opens its doors to technical college classes, allowing them on the factory floor to see engineering at work within its facility.

One way Kubota gives back to the community is through a program that supports veterans transitioning to farming by giving away tractors each year through an affiliated charity.

Grote

Grote is a lighting and safety systems manufacturer based in Indiana. Its 1,200 employees are primarily within North America, with small facilities in Germany and China.

Its business is a 50-50 split between OEM and aftermarket. Within off-highway, it leans toward OEM 80-20. LED lighting is its specialty.

"The number of regulations are high, but enforcement must also be consistent." – John Grote, vice president, sales and marketing

"Infrastructure investment is critical. We need better access to the interstate, as roads support industry. Improved access to our own markets will allow us to compete with anyone coming from anywhere in the world. Infrastructure spending focused on the ports—that spending benefits importers. Keeping our roads well-maintained and easily used will have a big impact."

Data ownership and monetization from telematics and the move toward higher voltage in the United States and Europe are key trends Grote is watching.

Grote is working with local vocation school students to identify and train students who can then transition to working in its facility.

VSS Macropaver
a division of Reed International

VSS Macropaver is a division of Reed International, and it produces the Macropaver, a production machine for slurry seal and microsurfacing. It is based in central California.

"Exchange rates haven't been a problem, as we have always built a better machine." – Jeff Reed, president and CEO of VSS Macropaver

Regulations remain a primary concern. Specifically, the regulatory mismatch between California and the rest of the country has proven difficult.

Skilled labor is a problem, both on the manufacturing side and on the sales side. "We've destroyed the trade school system in this country—particularly in attacking the for-profit trade schools. When you finish at a trade school, you have marketable skills."

"We support the community through pro bono construction work and supplying of building supplies. We've worked with the construction operation that built the local soccer fields and also donated concrete for special projects and road repairs (especially in the run-down part of town)."

Source: Association of Equipment Manufacturers 2017 Report
"The Market Size and Economic Contributions of the Off-Highway Equipment Industry"

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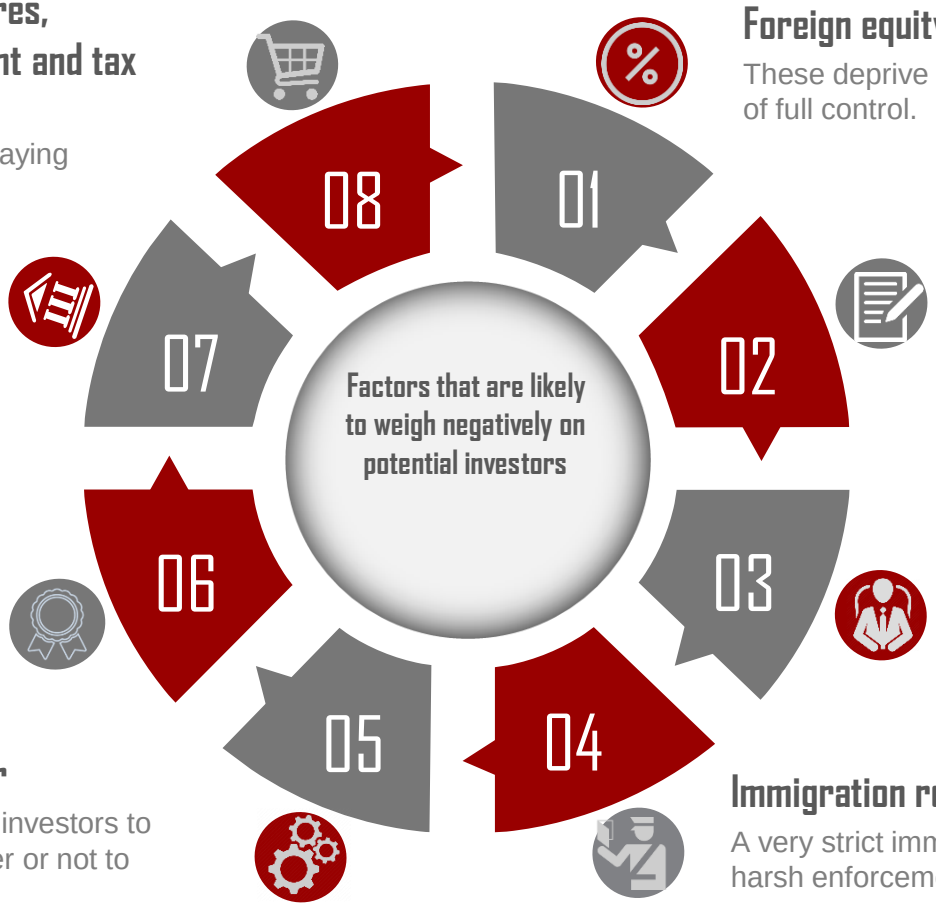
What Factors Repel?

Anything that raises the cost of doing business or increases investment risk



Disruptive import procedures, discriminatory procurement and tax policies

These can massively tilt the playing field against foreign firms.

Capital Controls

These and similar instruments raise the risk profile of a country for foreign investors.

Local content requirements

These can have a huge impact on investors' freedom of action.

Forced technology transfer

These requirements will force investors to consider very carefully whether or not to invest in a country.

Foreign equity limits

These deprive investors of full control.

Restrictions on forms of incorporation

These limit the options of investors and put them on an unequal footing with domestic firms.

Restrictions on appointing executives

Investors want to appoint people they trust with proven track records.

Immigration restrictions

A very strict immigration regime with harsh enforcement will deter investors.

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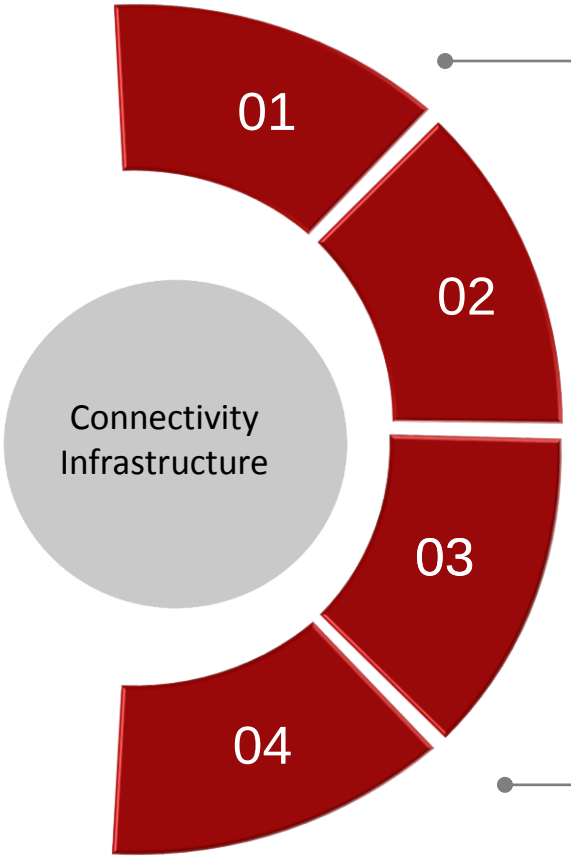
ICT Infrastructure | Digital Economy

The Four Segments of Connectivity Infrastructure



First Mile

The installations and equipment that link national networks to the World Wide Web

Middle Mile

The national backbone infrastructure that comprises fixed-line networks (backhaul), fiber-optic cables or copper wires, data centers, mobile base stations and other equipment

Last Mile

Or “local loop” comprises the final leg of a telecommunications network that typically terminates in the home or in a building where end users live or work

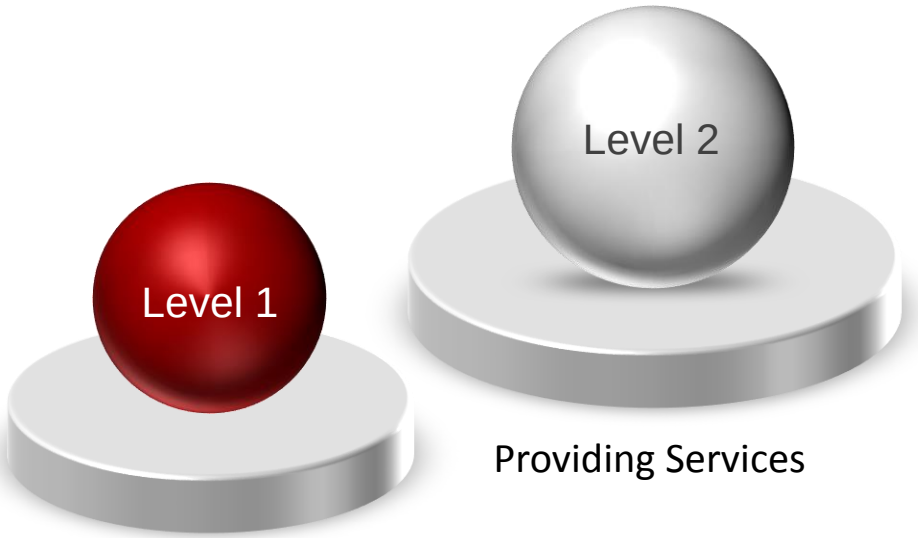
Invisible Mile

Consists mainly of spectrum and other invisible elements

ICT Infrastructure | Digital Economy

Economic Impact of Investing in Connectivity

- Manufacturing and selling equipment;
- Procurement and purchasing (credit financing);
- Installation work, (drilling, ducting, laying cable);
- Installation work
- Testing and certification;



Combination of technological advancements in ICT, digitization and online connectivity allow for the conceptualization and supply of many high-value services such as:

- Telecommunications;
- Internet service;
- E-commerce
- Cloud computing;
- Travel services;
- Ride-sharing;
- Distribution of digital media
- Ad infinitum

Economists differentiate between the so-called “first level” effects on the one hand and secondary or indirect positive effects on the other

ICT Infrastructure | Digital Economy

Conceptualizing the Digital Economy

	1 Infrastructure	2 Services	3 Platforms & Ecosystems	4 Devices
				
What?	> Telecommunications networks and connectivity infrastructure; > Optical fiber, cables, switches, signal amplifiers, servers, data centers, satellites, wireless base stations, mobile telephone towers, antennas, routers, modems, range extenders and other equipment that brings connectivity to our homes, offices and devices.	> Information, communications and computing services; > Comprises everything from banking to retail to booking and paying for travel and accommodation, to finding and booking someone to clean your apartment and someone else to take you to your next appointment.	> The result of multi-device connectivity, meaning we now connect to the internet with two or more devices and expect seamless operability; > Results in a winner-take-all competitive dynamic where the economics of network effects plays a very important role.	> Traditionally desktops or laptops > Mobile telephones are portable super-computers capable of almost any functionality; > Wearables (watches headphones) becoming more prominent, > Trend moving towards connected homes, connected cars, connected factories , IoT and the Internet of Everything (ubiquitous and comprehensive connectivity).
Who?	> Few large equipment vendors working with carriers; > 1000s of smaller players manufacturing and selling individual components.	> Telcos who invest in build, operate and lease access to their networks; > Millions of other providers from Citibank to Uber and across many other sectors.	> Google and Android versus Apple and iOS; > WeChat and Alibaba in China; > Amazon, Microsoft.	> The future belongs to those who can make all of the devices users want; > And connect them seamlessly with ecosystems that they either own or control.

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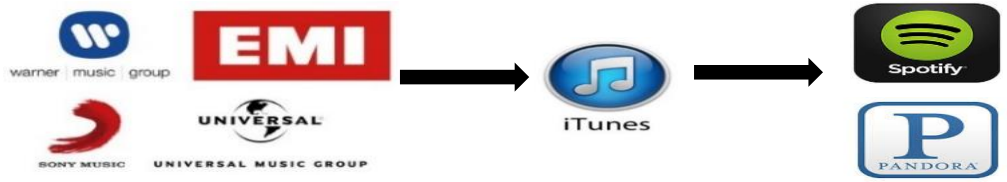
Definitions and Trends

Investors also want the freedom to disrupt

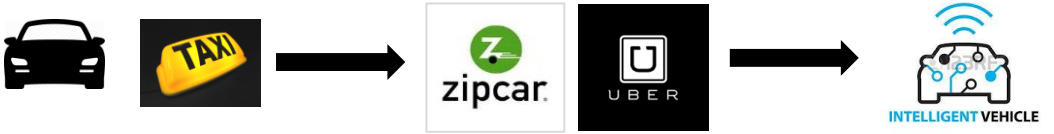
The record label business was first disrupted by iTunes which itself suffered disruption by music streaming services.



Card issuers have been challenged by online payment systems.

Global travel and tourism industry has been repeatedly shaken up by online platforms.

Individual transport solutions reshaped by ICT industry.



The emergence of competing operating systems has led to the rise of a winner-take-all dynamic.

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When Huawei Invests

Huawei at a Glance

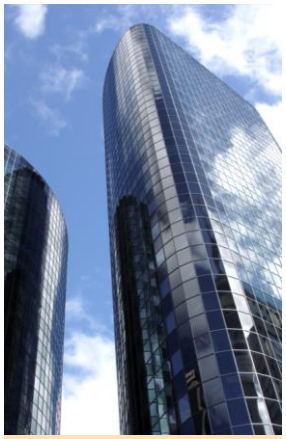
180,000
Employees

80,000
R&D employees

170+
Countries

15
R&D institute and centers

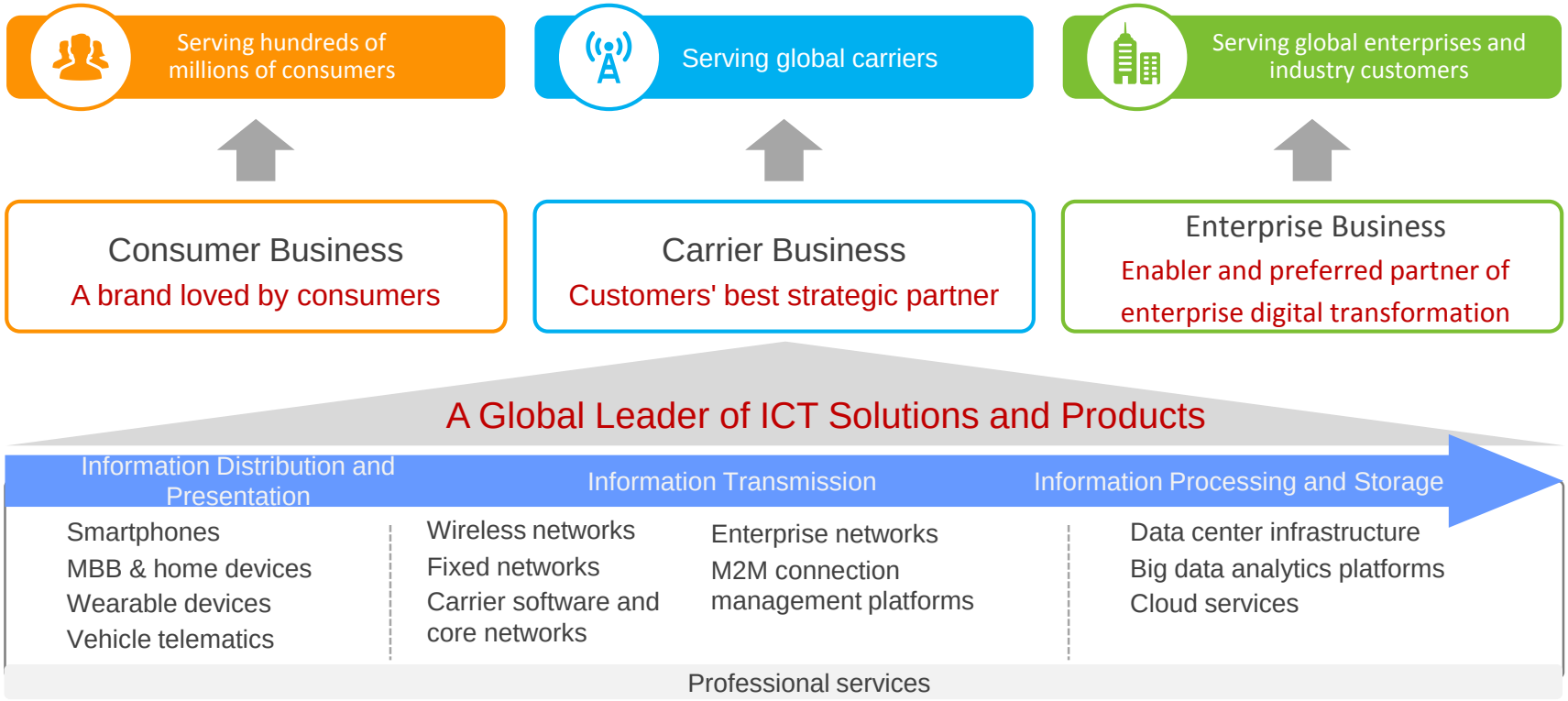
No. 72
Interbrand's Top 100 Best Global Brands



No. 129
Fortune Global 500

When Huawei Invests

Focusing on Information Transmission, Storage, and Distribution to Provide ICT Solutions and Services for Three Customer Groups



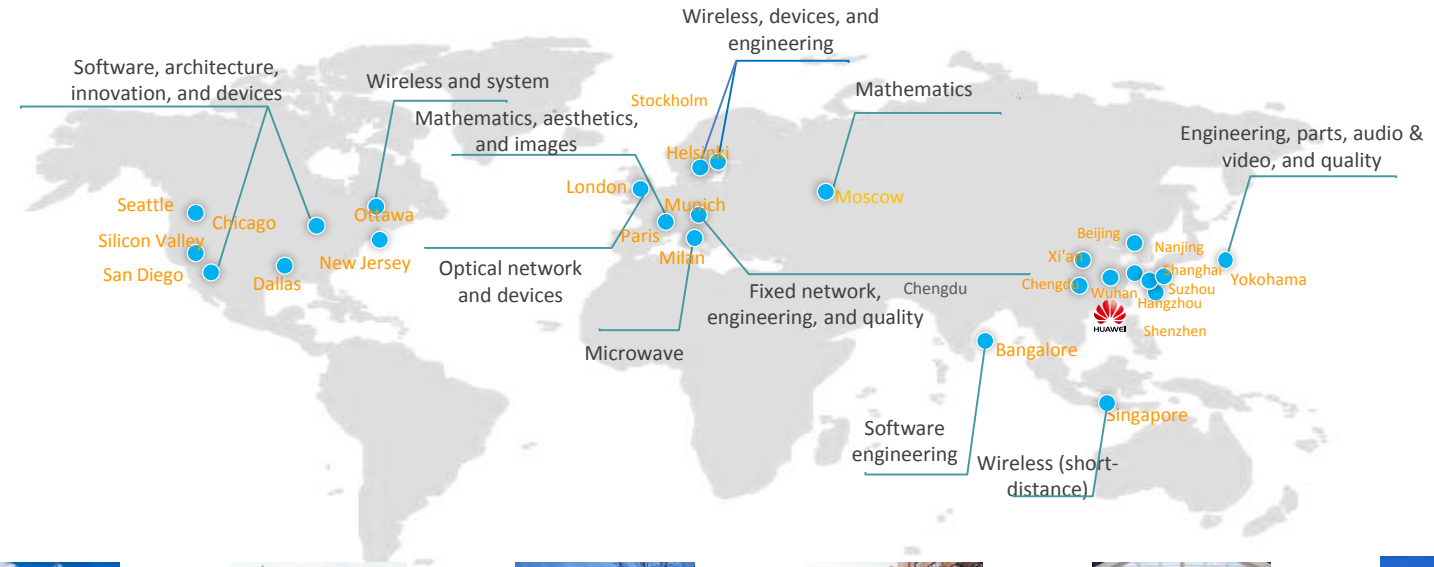
When Huawei Invests

Globalized Resource Deployment, Localized Operations

- Operations in 170+ countries; approximately 180,000+ employees comprising 160+ nationalities worldwide; 71% localization rate
- Huawei's global value chain allows the smooth transfer of capabilities around the world, develops and retains talent in local countries, and creates jobs and economic opportunities.
- Strengthen glocalized operations and ensure that local management teams shoulder operating responsibilities from end to end and have corresponding decision-making authority.
- Ensure that the global industry chain is grounded in win-win approaches and reciprocal obligations; be a responsible corporate citizen in the local community.

When Huawei Invests

R&D Centers Worldwide




Sweden


UK


Germany


Russia


Shanghai, China


Hangzhou, China

When Huawei Invests

Typical market entry, engagement and investment pathway

01 Enter a new market as a pure seller of equipment

Usually Huawei will send “scouts” to prospect for new market opportunities, or partner with a local and established distribution channel

02 Establish local office

If medium to long term market prospects are promising, Huawei will typically open a local office or open a technical support center, as well as investing resources in systematically bidding on tender opportunities.

03 Begin systematic stakeholder engagement efforts

Particularly with

- Operators who buy most of it’s equipment and enter into multi-year management service contracts with Huawei;
- Governments, who often own equity in one or more operators and who issue licenses.
- Broader society groups with CSR activities, etc.

04 Launch institutionalized engagement efforts

These often take the form of establishing joint research facilities with operators or sponsoring technical curricular or research local institutions.

05 Ramp up local presence

This can happen in a number of ways:

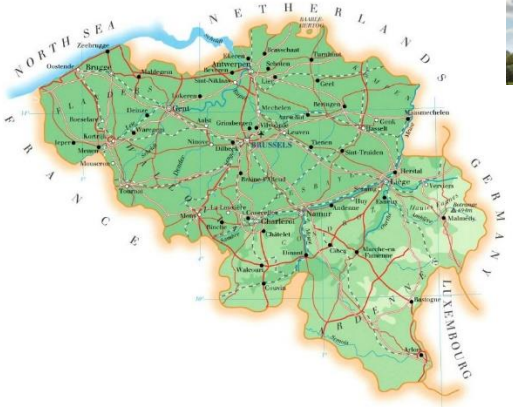
- Open a supply center;
- Establish R&D facilities;
- Establish production or assembly facilities.
- Training centers and specialized services centers.

When Huawei Invests

Huawei Technologies Belgium

Brussels

Established in February 2007 as a Branch office of Huawei Technologies Netherlands B.V.
Became Huawei Technologies Belgium NV in 2014
From 5 to over 200 Employees, localization >80%
Focus on developing Telecom Carrier Business , Enterprises Business and Device Consumers market .



Caliopa

Ghent

A Silicon Photonics research and development center, developing photonics chips for a wide range of telecom applications

Huawei R&D

Louvain La Neuve

Research site in Louvain-la-Neuve located at the Scientific Park
R&D focus: Application & Software

M4S

Leuven

R&D focus: development of world-class performance –on-demand transceiver chipset for next generation terminal solution in the advance technology

When Huawei Invests

Quick Facts

- Huawei first came to India in 2000.
- Today, Huawei products and services serve about 300 million local people.

Academic Cooperation

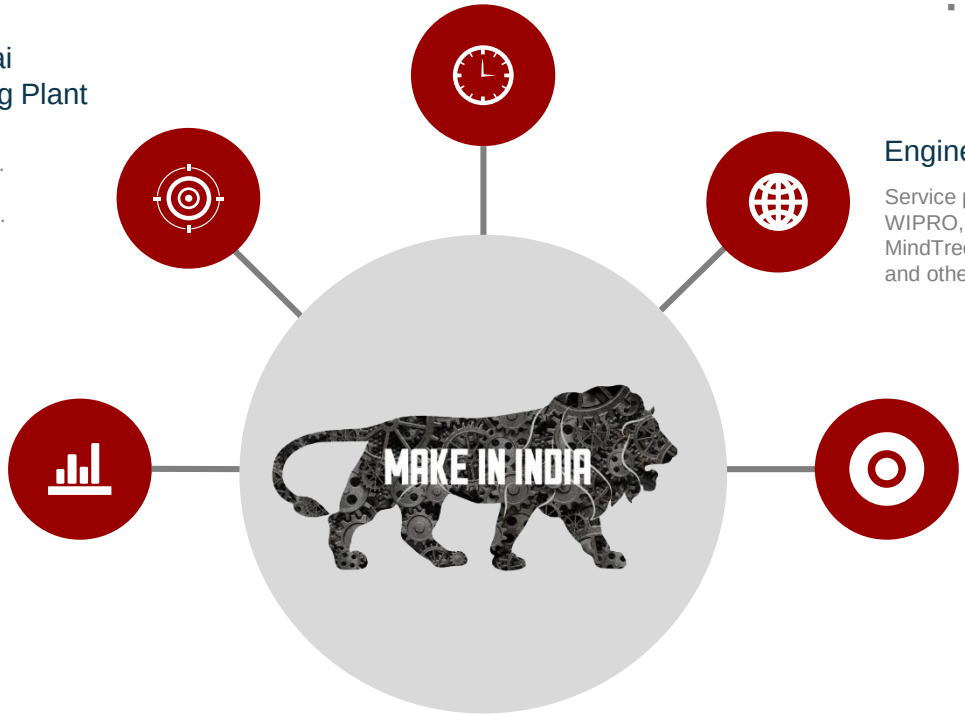
Cooperation with universities and research institutes particularly the Indian Institutes of Technology IITS

Head Count

- Approximately 5500 local employees
- 94% local hires
- 1500 in marketing sales and services
- 3000 in R&D
- 1000 in Global Services Center

Chennai Manufacturing Plant

Download this awesome diagram. Bring your presentation to life.



Engineering Cooperation

Service partners include TCS, WIPRO, GTL, TeleDNA, MindTree, HCL, TechMahindra and others.

Huawei Telecommunications (India) Company Private Ltd.

Offices in:

- Delhi
- Mumbai
- Bangalore
- Chennai
- Kolkatta

Huawei Technologies India Private Ltd.

- Bangalore Research Center
- Global Services Center.

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The Human Factor

Chandan Kumar (Huawei India)

Director- Marketing and Integrated Solutions New Delhi

Yunny Christine (Huawei Indonesia)

Deputy Director Public and Media Affairs, Jakarta

Aretha Frank (Huawei Nigeria)

Public Relations Manager Abuja

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Conclusions

Four things to bear in mind about the global ICT industry

1

ICT is not necessarily labor intensive

Manufacturing in ICT has largely been outsourced to contract suppliers like FoxConn or Flextronics with extremely tight margins, crushing work conditions and limited technology transfer.

2

ICT is an R&D intensive industry

You need a highly-developed pool of skilled professionals in order to attract the most capital-intensive investment (e.g. R&D centers).

3

ICT is multi-faceted

The ICT industry is hardware, software, services, it's logistics, marketing, engineering, distribution, etc. Each segment of the industry can become an investment for host countries with the right conditions and sound policies.

4

Trade and investment policies matter

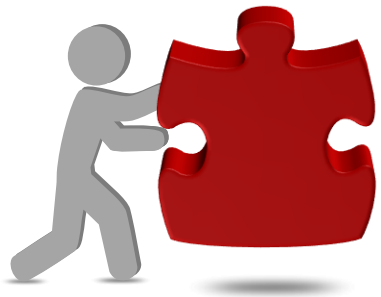
Participation to the WTO Information Technology Agreement is a basic pre-requisite for success. All major ICT hubs and players at the innovation frontline have localized most of their investment in ITA members. And it's very easy to do.

Conclusions

Some Characteristics of an Optimal Investment Regime

Market Access

- Have an open and non-discriminatory investment regime.
- Limit investment reviews to only the most clearly strategic assets.
- Limit the use of the nation security exception to the most clear-cut cases.

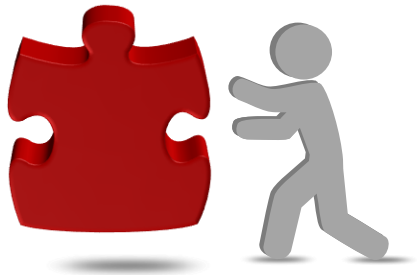


National Treatment

- Treat foreign investors the same as domestic investors in all areas of policy, regulation and legislation.
- Allow foreign investors to join local business associations

Partnership

- When contemplating far-reaching changes to the investment or business climate consult first with business and the private sector
- Work together with the private sector in enacting and implementing policy and regulatory reforms



Cross-cutting issues

- Skills
- Infrastructure and logistics
- Predictability of the investment climate | Ease of doing business | Rule of law

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