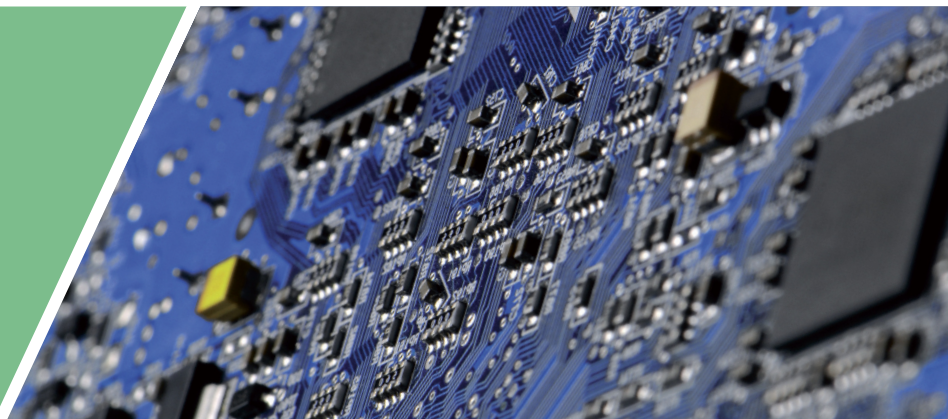


Panorama sectors

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and Rocky TUNG

We start this first 2014 Panorama dedicated to our global sector barometer, which assesses credit risk by key economic sectors in three of the world's major regions.

North America remains on track, with companies posting constantly improving results. Their confirmed financial strength stabilises sector risks at relatively comfortable levels. In Western Europe, the return to economic growth may only be gradual, but it is real. Without making any major changes, we note that sector risks tend to stabilise, particularly in the countries most affected by the last recession. Finally, Emerging Asia is now a cause for concern. The economic slowdown in China reveals structural difficulties that impact corporate profitability. Sectors suffering from overcapacity must inevitably restructure and this unavoidable process carries with it higher risks. The risk assessment of the metals industry, which epitomises every possible excess, has deteriorated in this environment.

We then propose a focus on the electronics industry in Emerging Asia, a region that has become in a matter of years the world's workshop for many electronic components. As Japan did previously, emerging countries in Asia have positioned themselves as key sector players. However, the model has its limits, and credit risk now tends to increase, as confirmed by the Coface survey of Chinese companies: medium-sized Asian players depend excessively on large foreign firms. Their margins are shrinking and they have to invest increasing amounts to keep up with rapid change. It is the case for Mainland China but also to a lesser extent for Taiwan and Hong Kong. Asian companies in the sector symbolise the success of emerging economies and are inevitably moving up the value chain. But do they have what it takes to limit the associated increase in risks?

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SECTOR BAROMETER

Khalid AIT YAHIA, Jennifer FOREST and Emmanuelle HIRSCH,
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Although the end of the recession has been confirmed, sector risk levels in Western Europe remain relatively high according to Coface, particularly in the construction, metal, and automobile industries. Rising risks in Emerging Asia have been the highlight of the first quarter of the year, as evidenced by the decline in the metal industry and by the impact of the Chinese domestic slowdown on the country's companies.

Credit risk index			
Sectors	Emerging Asia	North America	Western Europe *
Agro-Food	●	●	●
Retail	●	●	●
Textile-clothing	●	●	●
Transportation	●	●	●
Electronics, IT **	●	●	●

Sources: Datastream, Coface

* See credit risk index chart page 3

** Electronics, information technology and telecoms

● Moderate risk ● Medium risk ● High risk ● Very high risk

TEXTILE-CLOTHING

This sector reported mixed results depending on the subsector. Luxury clothing remains buoyant and technical textiles are attracting interest in India, which is starting to move upmarket.

● Western Europe

If companies in the textile-clothing sector have generally seen their sales expand by 15.5% over 2013, discrepancies remain. Luxury players, on the clothing side, are doing well, despite slower growth in Asia. «Fast fashion» players such as Inditex and H&M have experienced growth as a result of good sales performance. As for technical textile, Thuasne (in France) for instance has reported a 7% increase in sales.

● Emerging Asia

In 2013, corporate sales in the region increased by 11%, while profits gained 3.9%. China remains the leading world exporter of clothing, but because of higher production costs, it now faces competition from countries such as Indonesia. In fact, we estimate that production costs in the Chinese clothing industry have increased by 160% since 2005.

● North America

Better days are expected for this sector in the United States. Labour costs and the cost of fibres, the two main cost items, have come under control, and reasonable GDP growth (2.7% according to our forecasts for 2014) should boost sales in both textile and clothing. Companies in the sector, which reported an 8.8% increase in turnover in 2013, expect to make investments of more than US\$4 billion in 2014. The sector could thus generate more than 6,000 new jobs.

TRANSPORTATION

The maritime and air transport sector, which comprises global companies that operate in all three regions, had to undergo restructuring since 2009 to face lower traffic due to slower economic growth. The situation is improving overall in 2014, despite some persistent problems, such as overcapacity in maritime transport, among others. Credit risk has therefore stabilised at a medium level, but the trend remains positive.

● Western Europe

Air transport is gathering momentum in the European Union, with passenger and freight traffic increasing by 6.7% and 6%, respectively, between January 2013 and January 2014. After several years of restructuring, maritime transport is achieving some growth, despite strong competition and high oil prices. Transatlantic traffic, for instance, grew by 2.5% between 2012 and 2013. The outlook for 2014 remains favourable.

Generally speaking, transport companies have a healthier financial situation. Between 2012 and 2013, their turnover has in fact increased by 7.7% and their cash by 9%. At the same time, their debt has fallen by 5%.

● North America

North American companies benefit from the economic recovery and from their attractive positioning in emerging countries. As a result, their turnover at the end of 2013 was up 5% year-on-year.

● Emerging Asia

Asian companies in the sector remain very dynamic with an 11.2% increase in passenger traffic, mainly due to strong demand in their domestic market. As such, in China, turnover from passenger air traffic has increased by 20% between January 2013 and January 2014. Maritime transport is also improving, despite continued overcapacity. This momentum drove a 10.8% increase in turnover and a 13% increase in profits. We should nonetheless remain vigilant given that debt has increased by 15% between 2012 and 2013.

Credit risk index			
Sectors	Emerging Asia	North America	Western Europe *
Automotives	●	●	●
Metals	●	●	●
Pharmaceuticals	●	●	●
Services	●	●	●
Energy	●	●	●

Sources: Datastream, Coface
 * See credit risk index chart below

● Moderate risk ● Medium risk ● High risk ● Very high risk

METALS

World production of crude steel reached 1,607 megatonnes in 2013 (+3.5% vs. 2012). Growth comes essentially from Asia and the Middle East. Steelmakers struggle to push through price increases of about 4% per metric tonne, i.e. 470 Euros, which is affecting their margins.

● Western Europe

In 2013, companies in the sector reported a 2.6% decline in turnover and a 54% drop in profits. They have in fact purchased 30% less steel last year. Even if the European auto industry seems to be recovering, the construction sector, which continues to face persistent difficulties, represents 35% of the steel market. In the first two months of 2014, production is once again on the rise (+6.6% vs. 2013).

ArcelorMittal, which produces about 25% of European steel, expressed interest in taking over Ilva to strengthen its position in southern Europe. First contacts with Ilva and the Italian government have been made.

● North America

Although the turnover of companies in the sector has declined by 2.4% in 2013 vs. 2012, steel demand should rise in the United States in 2014, as a result of strong momentum in the auto sector and sufficient economic growth to stimulate the construction sector. Competition from low value-added Chinese products will however continue to weigh on the sector.

● Emerging Asia

China produces 49% of world steel, but its overcapacity is affecting the market by pushing down prices. The results of Chinese companies are affected, with a moderate increase in 2013 turnover (+2.9%), a 13.7% drop in profits, and a significant increase in late payments according to the Coface survey of Chinese companies.

AUTOMOBILES

Western Europe faces a more favourable outlook in 2014, after very difficult years in 2012 and 2013. In North America and Emerging Asia, the auto sector remains on track with a favourable outlook.

● Western Europe

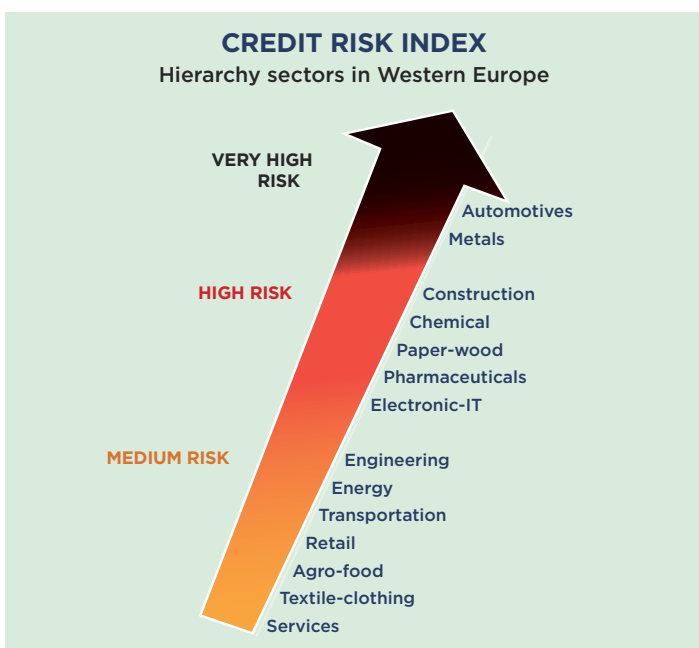
The region is experiencing six consecutive months of sales growth (from September 2013 to February 2014), boosted by the introduction of new models and by a more benign macroeconomic environment. This increase concerns both premium and mass market brands. The recovery in sales should improve factory utilisation rates, which have been weak. Net debt was reduced by 1% between 2012 and 2013. The momentum is therefore positive but will have to be confirmed later in 2014, given a still weak recovery in Europe.

● Emerging Asia

Risk remains moderate in this region. Auto sales are still in an upward trend. Profitability stands at 12% at the end of 2013, whereas turnover is growing strongly (+16% between 2012 and 2013).

● North America

The market remains buoyant. At the same time, the average price of vehicles sold continues to increase (+1.4% late March 2014 vs. late March 2013). Turnover has increased by 3% between 2012 and 2013 and cash flows by 6%. Given this comfortable financial base, sector risk is considered moderate by Coface.



Credit risk index			
Sectors	Emerging Asia	North America	Western Europe *
Chemicals	●	●	●
Engineering	●	●	●
Paper-wood	●	●	●
Construction	●	●	●

Sources: Datastream, Coface
 * See credit risk index chart page 3

● Moderate risk ● Medium risk ● High risk ● Very high risk

CONSTRUCTION

A key sector of the economy, construction is more than ever at the heart of government, household, and company concerns. The associated risk level varies from medium to high depending on the region: it is visibly improving in the United States and remains high within the European Union.

● Western Europe

Caution is still required towards European companies in the sector whose credit risk index remains very high. These companies continue to suffer from weak activity in most countries in the region. Consequently, corporate profitability in the sector has fallen by 12.2% between 2012 and 2013. The situation is unchanged at the start of 2014. In February 2014, the Eurostat confidence index for the sector remained strongly negative (-29, the weakest level since August 2012). Order books continue to fall: -10% in January 2014 vs. January 2013, and prices are still expected to drop over the next three months. European Union countries are however facing different situations. Companies in Spain, France, Portugal, and Italy are severely penalised by the poor sector outlook, with building permits still declining. In the United Kingdom, the sector experienced a slight slowdown in late 2013, mainly due to poor weather conditions. In Germany and Denmark, a slight recovery is under way in the sector.

● Emerging Asia

The construction sector remains buoyant in this region and offers a medium credit risk. Strong household demand provides support. Turnover is therefore up 11.4% in 2013 vs. 2012. The sector nonetheless faces some difficulties. Property prices continue to rise, namely in China. We have in fact seen prices rise over the past 21 months, even in the face of measures taken by the authorities to contain them. Prices now appear too high for a large section of the population. Meanwhile, the construction sector in India is facing a slowdown in the pre-election period.

● North America

The risk index in the region remains medium with an 11.4% increase in sector turnover and a 14.3% reduction in payment failures registered by Coface. This good performance is due to American companies that benefit from the sector's momentum. For instance, in February 2014, the number of building permits increased by 5% (compared to February 2013). Property prices, which are still low, have continued to increase since October 2012 (+7.8% over the last 12 months). Moreover, construction expenditures were up 9.3% at the end of February 2014 year-on-year. Companies benefit from a once again dynamic market, favoured by access to more flexible credit as well as falling stocks. The situation is very different in Canada. Companies in the sector are penalised by overvalued prices in the property market. While a downward correction is expected, the index for new property prices has increased by 1.5% between January 2013 and January 2014. Additionally, household debt is very high and limitations to

property loans are weighing down the sector, particularly for residential investment. Building permits were down significantly in late 2013.

ENGINEERING

Economic activity in Western Europe is slowly picking up, while growth appears sustainably established in North America. This positive backdrop improves the outlook for the engineering sector in these two regions. Emerging Asia remains nonetheless bogged down by penalising structural difficulties, despite experiencing sustained growth.

● Western Europe

Dominated by Germany, the engineering sector is experiencing some renewed confidence in the region. Cash flows expanded by 16% in 2013 year-on-year, while turnover grew by 8% over the period. Companies in the sector are benefiting from sustained investment in North America (particularly favourable for German companies). Risk levels remain medium.

● North America

The outlook is positive for the main North American companies. Their growth appears well supported. They have «pile of cash» to ensure sustained investments. The engineering sector offers strong profitability (around 17.5%). Companies continue to reduce debt, with a 4% drop in net debt between 2012 and 2013. The short-term outlook is favourable. Risk is medium.

● Emerging Asia

The profitability of Asian companies in the sector is down 10% at the end of 2013, and net debt increased by 8% between 2012 and 2013. Overcapacity in China in metals (steel and aluminium), petrochemicals, and in the cement industry is holding up investment in fixed assets, and consequently weakening the outlook. These sectors will necessarily have to make adjustments to absorb the excess capacity. Risk therefore remains high.

CREDIT RISK INDEX METHODOLOGY:

Coface's assessments are based on the financial data published by over 6,000 listed companies in three major geographic regions: Emerging Asia, North America and Western Europe.

Our statistical credit risk indicator simultaneously summarises changes in four financial indicators (turnover, profitability, net indebtedness, and cash flow) completed by the claims recorded through our network.

ELECTRONICS IN ASIA: innovation, engine of growth and risk factor

Christophe Barbe, Emmanuelle Hirsch, Group economic research, Coface
Rocky Tung, Group economic research, Hong Kong

The electronics industry⁽¹⁾ is young; emerging only after the Second World War, but it has gradually become essential to all other industries. Strong competition between sector players and rapid product cycles have led to fast changes, both with regard to technological change and global market structure.

This capital intensive industry has become an essential player in the world economy.

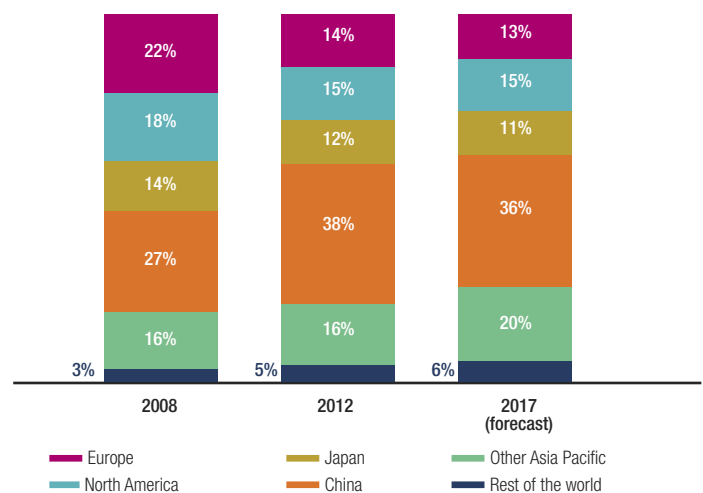
Global electronics production is estimated in 2012 at close to €1,500 billion and should experience a growth rate of more than 3% per annum until 2017.

Its production and innovation centre of gravity has moved from the «triad» countries (North America, Europe, and Japan) to Emerging Asia, mainly China and South-East Asia (South Korea, Taiwan, Singapore, Malaysia).

Accordingly, the triad countries that supplied 70% of world production in 2000 only represent 40% today. At the same time, the share of the Chinese electronics industry went from 12% to nearly half of world production (40%) (chart 1).

While considered dynamic, is this sector devoid of risk, even considering its epicentre, which is Asia? Does it suffer from the weak growth in most developed economies as well as from the economic slowdown in China? Does the introduction of new products, of new connected services that require substantial investments in research and development, impact corporate solvency? After recalling the industry's recent history over 4 key periods, we will analyse the current turning point, characterised by stiffer global competition and the emergence of new risks and challenges for the companies in the sector. Fierce competition from Asian players and the cost pressure of the major players are placing companies, mainly Chinese companies, in difficulty. There is also evidence of risks in Hong Kong and Taiwan. Margin pressure is likely to last. Nonetheless, the Chinese government⁽²⁾ is taking measures in favour of long-term investment and of cooperation on innovation between Chinese and foreign companies.

CHART 1:
World electronic production by regions



Source: DECISION, March 2014

SECTOR VITALITY IS GROUNDED IN RAPID CHANGES TIED TO INNOVATION

A - FLEXIBLE SECTOR, ADJUSTING TO SHIFTS IN DEMAND

The electronics industry has undergone four main development stages since its post-war origins, during which its scope has broadened to all other industries. These development stages illustrate how electronics have spread through increasingly varied uses to all matters of economic, industrial and personal life, to contribute to improved competitiveness and greater productivity for countries, companies and people.

The different stages of evolution of the sector's product/market pair were fairly linear, impacted nonetheless by two severe crises: 2001-2005 and 2008-2010:

1. Military-industrial uses (the post-war «golden years»). The markets for electronics are essentially industry-oriented, including the defence sector, and thus mainly aimed at governments.
2. Expansion to the corporate world (1980-1995). The opportunities arising from the characteristics of electronics favour its spread from government uses to corporate uses, mainly through industrial computing and numerical-control machines. Computerisation allows companies to increase their productivity.
3. Individual uses (1995-2007). This third development period is unprecedented as electronics find new personal uses. It is the boom of mobile telephony, personal IT (PC, games, etc.), MP3 players, etc. It is also the time of the first electronics industry crisis in 2001, which mainly affects developed markets.

(1) Our study will address industrial electronics (component manufacturers, etc.) and consumer goods (high-tech production, such as smartphones, etc.). We will not cover electrical household appliances (white goods and small electrical household appliances) or operators.

(2) IC Market China Conference: China Semiconductor Industry Association speech, Wuxi, March 2014.

They have in fact not anticipated the shift in demand towards Emerging Asia. The bulk of investments and production has shifted over to this part of the world. China is sustainably established in the market as a producer: its market share in production doubled between 2001 and 2005.

4. Today, emerging countries that are less affected by the 2008 financial crisis and that benefit from an attractive growth outlook and relatively low production costs, continue to attract direct investments. At the same time, a new growth cycle is emerging as electronics expand into other personal markets: the environment, health, or safety. These new «high-end» societal uses, with their own characteristics in terms of structure and cycle, open up new opportunities for industries in developed markets.

Innovation has, of course, driven this extraordinary flexibility.

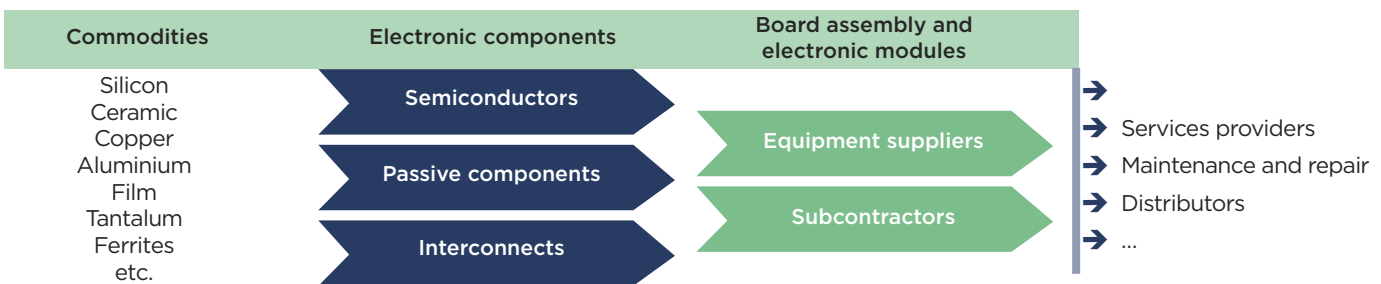
B - INNOVATION HAS HAD A MAJOR IMPACT ON THE VALUE AND SUPPLY CHAINS

If the bulk of past innovation came from the United States, Europe, and Japan, globalisation has led to a new knowledge organisation and greater knowledge mobility. Multinational firms (MNF) spearheaded this development and as such, encouraged the spread of GPNs⁽³⁾. These have enabled the rise of Asia. They were followed by GINs⁽⁴⁾, which have gathered momentum while changing traditional learning environments; because MNF saw in them a way to increase their return on investment and penetrate emerging markets to drive growth. It also had an impact on the supply chain.

The electronics industry supply chain can initially be broken down into 2 main categories of players: electronic component manufacturers and electronic equipment suppliers (*chart 2*).

CHART 2:

Main milestones of the electronic value chain



Source: DECISION, étude sur la filière et les métiers de l'électronique

All of these components can then be segmented into 3 main markets, each with their specific know-how and industrial logic.

- Semi-conductors are at the heart of innovation and generate the main sales volumes. They were at the heart of the 20th century digital revolution. The market has expanded by more than 5% in 2013 to reach global revenues of more than 315 billion of dollars. Intel consolidates its world leadership for the past 22 years, with a 15.4% market share. The momentum of «memory» sales was at the onset of the rise of SK Hynix and Micron Technology among the first world leaders. Their turnover increased by more than 30% and 70%, respectively.

This constant improvement of micro-processors should mark a halt by 2020. In fact, according to Robert Colwell, former head of Intel's Pentium Pro project, Moore's law stating that the capacity of a similar sized chip should double every 18 months, should come to an end in the next few years. Will final consumers be prepared to pay more for their laptops? Tablets and smartphones will in fact only offer minor improvement (storage capacity, data transfer speed, etc.) in their eyes. Meanwhile, huge investments, amounting to billions of dollars, will be required to improve by 5% or 10% the chip's productivity. Will large groups, including Intel, continue to invest if they cannot pass on part of the costs to the final consumer?

TABLE 1:

Top 6 Semiconductor Vendors by Revenue, Worldwide, 2013 (millions of dollars)

Rank 2012	Rank 2013	Vendor	Country	2012 revenue	2012-2013 revenue	2012-2013 growth (%)	2013 market share (%)
1	1	Intel	United States	49,089	48,59	-1	15.4
2	2	Samsung Electronics	South Korea	28,622	30,636	7	9.7
3	3	Qualcomm	United States	13,177	17,211	30.6	5.5
7	4	SK Hynix	South Korea	8,965	12,625	40.8	4
10	5	Micron Technology	United States	6,917	11,918	72.3	3.7
5	6	Toshiba	Japan	10,61	11,277	6.3	3.6

Source: Companies reports, Gartner Inc. (April 2014)

(3) Global Production Networks are defined by Sturgeon (2001) as "a set of interfirm relationship that bind a group of firms into a larger economic unit"

(4) Global Innovation Networks are collaborations and interactions between different firms and organisations producing and exploiting new knowledge in a global scale for purposes of fostering specific innovative activities beyond geographic boundaries.

- Passive components (transistor, resistor, and capacitor) encompass a large panel of technology and know-how. In 2013, global revenues of this sub-sector stood at around 21.7 billion of dollars. Taiwan, the United States, Mainland China, South-East Asia, and Japan are the main production centres. Japan dominates with a market share of 52%, which is expected to rise further as a result of the depreciation of the yen.

By comparison, China, which controls only 7% of the market, is essentially specialised in manufacturing low-end products. The production of passive components is largely automated, resulting in a limited production area. Many companies, whether they are Japanese or American, prefer in fact to produce locally and turn to China and South-East Asia for low value-added products.

TABLE 2:

Top 6 of leading passive component producers worldwide by revenue (million of dollars), 2013

Rank 2013	Company	Country	2012 revenue	2013 revenue	2012-2013 growth (%)
1	Murata	Japan	5,100	4,900	-3.9
2	TDK	Japan	4,356	4,150	-4.7
3	TAIYO YUDEN	Japan	1,910	2,080	8.9
4	SEMCO	United States	1,685	1,990	18.1
5	AVX/KYOCERA	Japan	1,414	1,380	-2.4
6	Panasonic	Japan	1,210	1,088	-10

Sources: RIC Global and China Passive Component Industry Report 2012-2013

- Interconnection components (connectors, printed circuits) are used to transit electrical signals and to interconnect the other different components. This electronics sub-sector is a niche industry, with more than 1,000 manufacturers across the world. Many of these companies are hyper specialised and market leaders for their products. The presence of large groups should not overshadow the existence of small companies which, through their presence in a given area, market or type of product, can offer the best turnaround times, a more advanced technology

for a given application, and more competitive prices. In 2013, the sub-sector's turnover amounted to 48.9 billion of dollars, up 2.7% vs. 2012. Global sales increased by 4% in 2013. In Asia-Pacific, sales grew by 5.8%. In 2012, the first ten manufacturers of connectors, which controlled 59.8% of the market, had a strong global presence, a wide range of technically advanced products likely to have an impact on sector competitiveness. The sector is also undergoing consolidation, as over 300 acquisitions since the 1980s have been identified by the firm Bishop & Associates.

TABLE 3:

Top 6 connectors manufacturers, annual sales (million of dollars), 2012

Rank 2012	Company	Country	2011 revenue	2012 revenue	2011-2012 growth (%)
1	TE Connectivity	Switzerland (headquarter)	8,476,0	8,482,0	0.1
2	Amphenol	United States	3,676,2	4,015,3	9.2
3	Molex Inc	United States	3,581,8	3,580,3	0
4	Foxconn (Hon Hai)	Taiwan	2,718,0	2,682,5	-1.3
5	Delphi Connection System	United States	2,521,7	2,588,5	2.6
6	Yazaki	Japan	2,176,0	2,278,0	4.7

Sources: Companies reports, Bishop & Associates

These different components are the inputs for producing either intermediate products or finished products (having different end users).

We should therefore consider two different types of products:

- Production for mass markets requiring high production volumes and where economies of scale are sought through investment, while offering global coverage and very short time-to-market to satisfy demand (produce quickly and in large quantities).

- So-called «industrial» markets, where value-added comes from integration and where production facilities must adapt to small- and medium-scale runs, which require sales support.

In the first case, the production chain has gradually moved to countries where production costs are low (China, South Korea, etc.). This transfer is particularly visible in labour-intensive segments (such as assembly or semi-conductor testing), whereas semi-conductor manufacturing requires less labour.

The flying geese paradigm⁽⁵⁾ is an illustration of moving up the global value-chain. Japan was the first country to demonstrate this theory, which describes how its electronics industry has moved upmarket. In the first stage, manufacturing low value-added products generated low margins. Subsequently, rising production costs drove production to move to lower cost countries such as South Korea, Taiwan, Singapore, and Hong Kong. At the same time, Japan continued to move up the chain by manufacturing higher value-added products. When the former countries experienced in turn rising production costs, production was further transferred to other places such as Thailand, the Philippines, Malaysia, or China. Currently, increases in Chinese costs could result in the production of certain elements to move back to Europe and the United States.

Competition in the electronics sector is exacerbated by rapid technological change, as well as by strong market responsiveness to rapid product obsolescence. Dieter Ernst, a member of the East-West Center for research, defines innovation in the electronics industry as: «a capacity to combine lower costs, rapid market penetration, and product differentiation through improved returns. This explains why innovation in the electronics industry is cumulative and non-discreet»⁽⁶⁾. If we add to this definition the idea of knowledge dispersion, the traditional value-chain is threatened. This favours the implementation of vertical integration both in production and innovation.

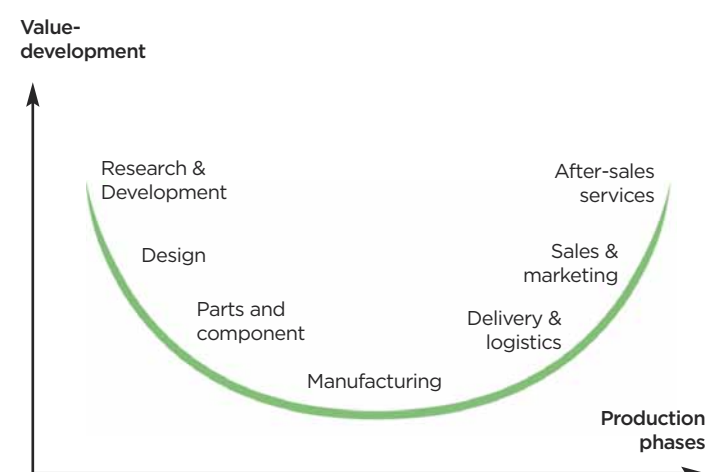
C - INNOVATION IN THE MOVE TOWARDS SPECIALISATION: THE CASE OF CHINA

Moving up the value chain is the motto of Asian economies, particularly China. For instance, Chinese Premier Li Keqiang said in the CPC meeting in March 2014 that the country would focus on innovation and to move up the global value chain via upgrading its industries⁽⁷⁾.

This has been echoed by researchers, including those in academic institutions and international agencies. According to Koopman, Zhi Wang and Shang-Jin Wei (2013), value-added domestically in the Chinese exports accounted for less than half the value of the country's processing exports in 2004⁽⁸⁾. In her speech at the 17th China International Fair for Investment & Trade (CIFIT), Karin M. Finkelston, vice president for Asia Pacific of the International Finance Corporation, expressed that «China needs to shift up the global value chain»⁽⁹⁾. But what exactly does it mean?

In order for us to get a sense of what it means, we can refer to Stan Shih's smiling curve. The chart below (*chart 3*) is an adaptation of the smiling curve first introduced by the now-retired founder of Acer. In a nutshell, Stan Shih tried to illustrate the idea that value added to the final product varies across different steps in the product-making process. Using the value allocation illustration as below, much of the value is captured at the earlier and later parts of production process - namely research & development (R&D) and customer services - while manufacturing and assembly activities contribute the least value-added to the product among the different activities along the production process.

CHART 3:
Adaptation of Stan Shih's smiling curve



Source: Coface, adaptation of Stan Shih's smiling curve

The smiley curve above is illustrative of how the global production network is operated. In academia, various studies have been conducted to dissect the meaning of value-added. Particularly, production of Apple's products, including the iPod study (Linden et al. 2009)⁽¹⁰⁾, and the iPhone study (Xing and Detert, 2010)⁽¹¹⁾ - among the others - are key examples of such studies. The common ground of these products - besides being Apple products - is that they are labeled «Made in China», and they are contributing tremendously to the Chinese exports figure using the traditional calculation methods.

Although these products are «made in China», most of the parts and components are not originally from this country. Indeed, as suggested by Xing and Detert (2010), most of the major and most costly parts and components are imported into China, where they were later assembled into a finished good, i.e. iPhone 3G, and shipped from Chinese ports to various parts of the world, including the US.

Undeniably, the assembly process itself is generating a lot of benefits to the Chinese economy, most particularly via providing lots of low-skilled job opportunities. In the case of iPod's manufacturing process it did create demand of jobs partly due to the abundance of low-skilled labour in China (i.e. number of job).

Yet, as suggested by their study (Linden et al., 2009), even though China represents 29.8% of iPod related jobs, wage earned is 2.2% of the total wages earned by relevant workforce⁽¹²⁾. Such findings suggest that positive influence on China's participation in iPod's value chain - specializing in the manufacturing and assembly processes - may be overestimated from the macro perspective.

TABLE 4:
iPod related wages and jobs by country

Country	iPod-related wages (USD)	iPod-related jobs
United States	745,868,260	13,920
China	23,591,100	12,270
Philippines	13,380,000	4,750
Japan	102,380,000	184
Singapore	16,115,750	925
South Korea	35,664,000	1,200
Thailand	2,355,000	800
Taiwan	9,000,200	340
Other	116,000,000	5,125
Total	1,064,354,310	41,170

Sources: Linden et al. 2009

(5) Akamatsu's third flying geese paradigm is a model for international division of labor in East Asia based on dynamic comparative advantage. The paradigm postulated that Asian nations will catch up with the West as a part of a regional hierarchy where the production of goods would continuously move from the more advanced countries to the less advanced ones.

(6) Dieter Ernst's study: "A new geography of knowledge in the electronics industry? Asia's role in Global Innovation Networks", dans Policy Studies 54, 2009, East West Center, Etats-Unis.

(7) Xin Hua (March 2014)

(8) Xin Hua Net (March 2014)

(9) Karin M. Finkelston's speech at the 17th China International Fair for Investment and Trade (September 2013)

(10) Linden, Dedrick and Kraemer (January 2009)

(11) Xing and Detert (December 2010)

(12) Linden, Dedrick and Kraemer (2009)

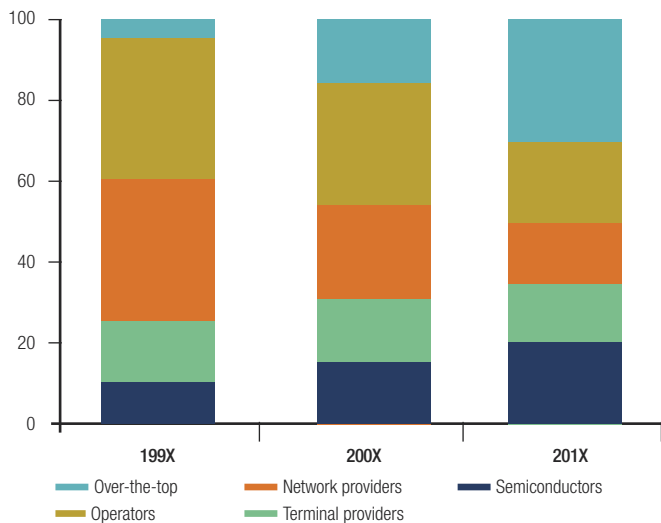
The understanding of value-added concept is important for us to understand what each country is really benefiting from the production chain. In the case of China's participation in the electronics space – if findings from the studies of Apple's products are applied across the board – then China's contribution to the industry and its benefits from such industry could be significantly lower than what was reported in gross-value term.

BUT THIS FLEXIBILITY GENERATES RISKS... ARE THEY UNDER CONTROL?

A - COMPONENT MANUFACTURERS UNDER PRESSURE

Apple is nonetheless an example that shows the weight of large groups in the value chain and the resulting possibilities to dictate price terms for semi-conductors, control the product road-map, and obtain guarantees regarding delivery times. This weight is a genuine competitive advantage allowing Apple to offer high technology products at lower prices than competitors. By integrating software⁽¹³⁾ and hardware⁽¹⁴⁾ components, Apple has completely removed soft and hardware providers from the supply chain. It has demonstrated that the value of a product does not only depend on the value of its components, but also on the way the different parts work together.

CHART 4: Estimated world evolution of the relative market share of IT actors



Sources: Michel Levy, Innovation, Nouveaux Services et Modèles d'affaires dans les Télécommunications

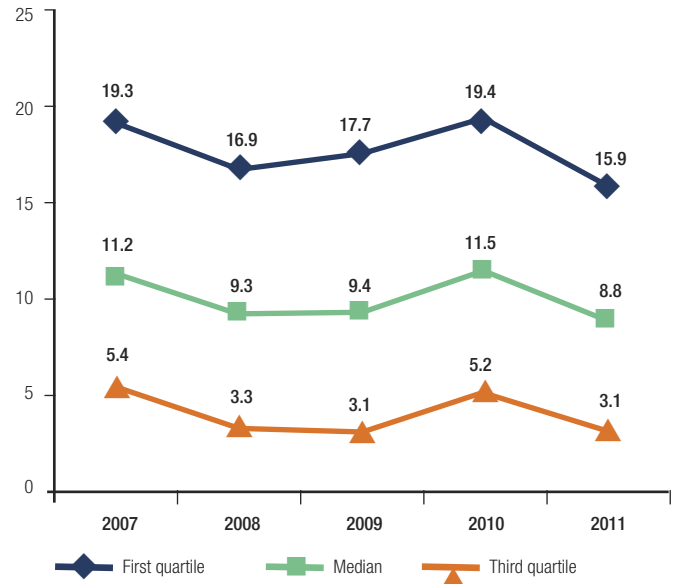
Innovation can be found among players at either end of the market, i.e. semi-conductors that offer more and more complex products and Over-The-Top⁽¹⁵⁾ players (chart 4) that create new offers (such as Google with Android). The substantial resulting benefits do not trickle far enough down the supply chain. This results in lower margins for component manufacturers, particularly medium-sized players with turnover between 25 and 30 million of dollars (chart 5), whereas the margins of new service users (Apple, Samsung with Android) are expanding (chart 6).

(13) Refers to computer programmes

(14) Refers to computer equipment

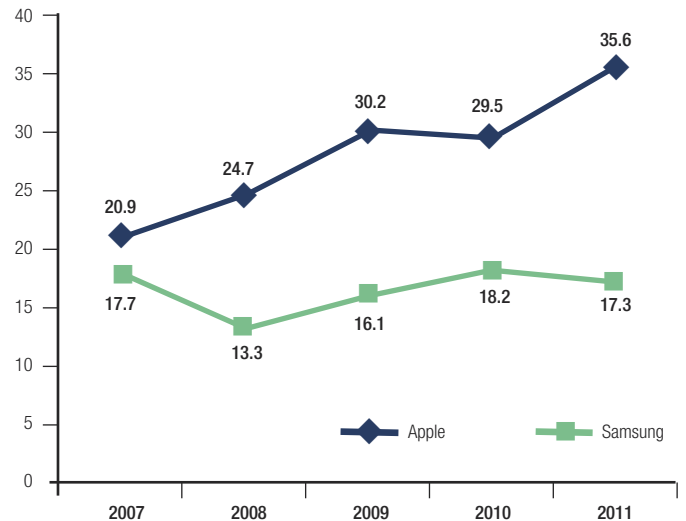
(15) Sofrecom (a subsidiary of Orange) defines Over-the-Tops or OTTs as holding a strategic position in a value chain. OTT providers use existing structures installed by another player to provide a service.

CHART 5: EBITDA Margins (in %) Asian small components manufacturers, revenue in the range of USD 25 millions to USD 300 millions, (sample of 676 companies)



Source: CapitalIQ, ANZ

CHART 6: EBITDA Margins (in %) Apple et Samsung

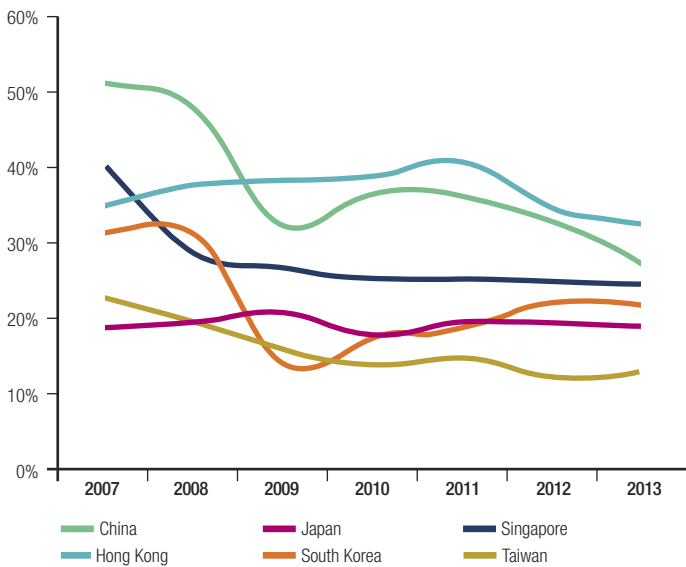


Source: CapitalIQ, ANZ

The introduction of new products such as smartphones, tablets, games, new software and online services have further changed the traditional value chain. This part of the electronics industry aimed at consumers has allowed for the emergence of two major players: Apple and Samsung. Together, they have generated as much turnover as all the other companies in the sector put together⁽¹⁶⁾. In 2012 for instance, Apple's turnover increased by 45%, that of Samsung gained 22%. The «other remaining companies» include «The Next Four» (Panasonic, Sony, LG, and Sharp) and «Everybody Else». Their combined 2012 turnover has fallen by 7% and their profits by 28%. While some companies in this group are profitable (such as game manufacturers), others (audio component manufacturers) are suffering from shrinking margins, regardless of their country of origin.

(16) A Tale of Two Tiers, The 2014 Global Consumer Electronics Outlook AlixPartners.

CHART 7:
Profitability ratio per country for IT companies (%)



Sources: Datastream, Coface

At the other end of the chain, semi-conductor manufacturers suffer from the dominance of Apple and Samsung. As the dominant buyers on this market with respective component purchases amounting to 30.3 billion dollars for Apple and 22.2 billion dollars for Samsung, they can impose their conditions to their suppliers. 40% of Foxconn's turnover for instance depends on Apple. In this situation, Foxconn aims to reduce this dependence by developing partnerships (Mozilla) and by investing in higher value-added products (robots, software development).

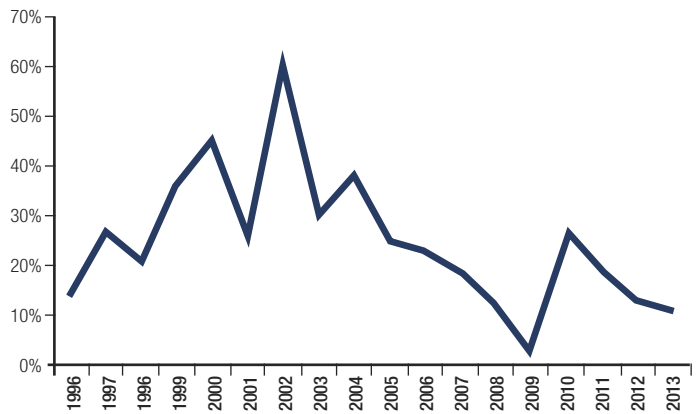
As China accounts for more than one third of the world electronic production, its companies are particularly concerned by this pressure on costs and margins.

B - WHY IS THE SECTOR BECOMING MORE RISKY IN CHINA?

The rise of electronic sectors in China started in the 1980s, but accelerated in the 90s, roughly about a decade after China has re-engaged the global economy. It did not take long before the Chinese economy has emerged as a main industry participant in the global platform, and the spectacular growth continued to sustain until today. With China's accession in the WTO as a catalyst, growth was particularly strong between years 1997 and 2007, with a record compounded annual growth rate of 31.6%, before growth momentum was slowed by the global financial crisis. Industrial sales value of the electronic industry has reached RMB 9.4 trillion in 2013 comparing to the RMB 1.7 trillion in 2003. Low cost of non-tradable factors, highlighted by the abundance of land and low-skilled labour, were the main driver of the success.

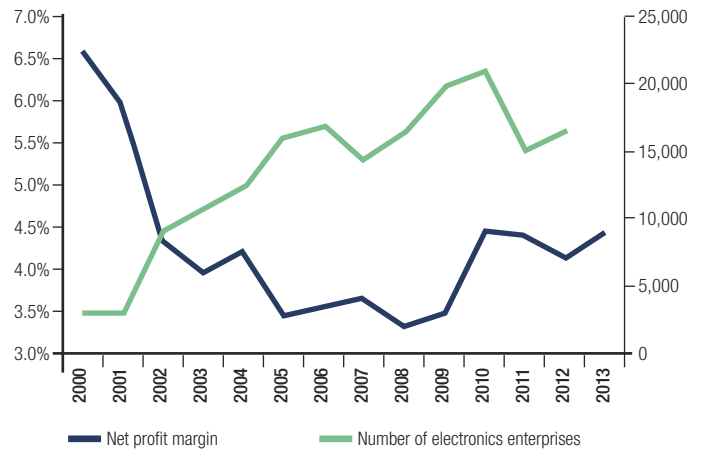
During the course of expansion, the industry did not grow within any headwinds, however. With low barrier to entry to participate in the market, more competition comes into the market and margin squeeze was a result of the fierce competition. As illustrated in the chart below, average net profit margin slid from over 6.5% in 2000 to 3.3% in 2008 amid the global financial crisis, while number of electronic companies grew 4.6 times during the same period (chart 9).

CHART 8:
Growth of industrial sales value, electronic industry (%)



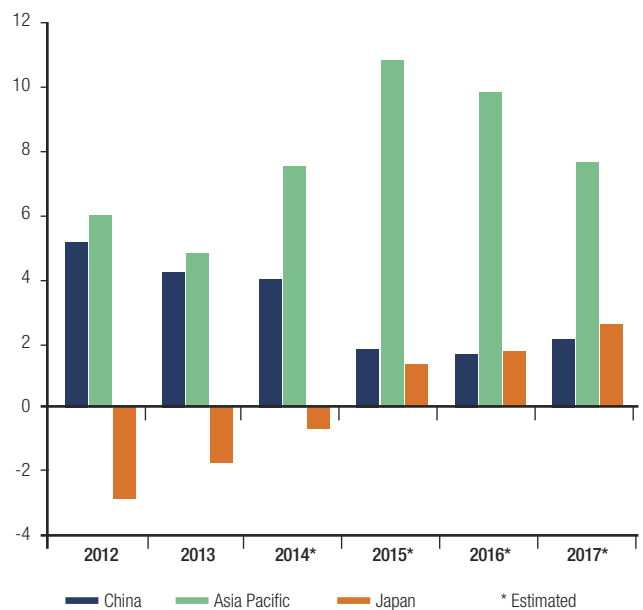
Sources: CEIC, Coface

CHART 9:
Number of electronics enterprises in China and margins (%)



Sources: CEIC, Coface

CHART 10:
Electronic equipment production growth rate (in %) per year

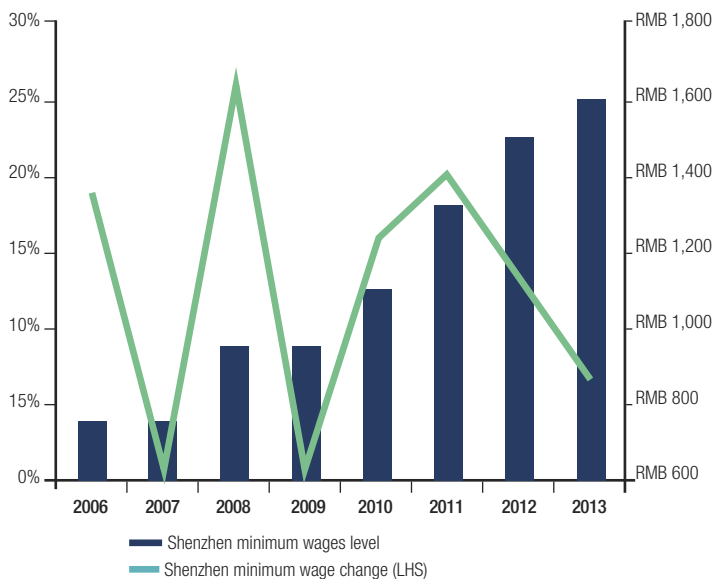


Sources: Cabinet Décision, World Electronic industries 2012-2017 (March 2014)

From then onwards, Chinese electronics manufacturers, as well as other businesses in China, were facing headwinds both domestically and internationally. Demand was weakened, labour cost was on the rise, and input (e.g. commodity and administrative) prices were rising rapidly. Renminbi has also appreciated quite drastically against the USD, making Chinese made products less price-competitive comparing to years ago. At the same time, companies were facing tightened credit facilities (i.e. heightened interest rate and required reserve ratio) from the regular banking system. These various factors combined have driven almost 6000 electronics companies- representing 28.3% of the firms in the industry in 2010 - out of business in 2011. With such development, it is noteworthy that the lesser competition has in turn led to the notably higher profitability in recent years.

As discussed above, rising labour cost and RMB appreciate are two main factors driving businesses out of the market in 2011. Pressure from these two factors remain, but has declined dramatically since 2011. As we can see from the chart below, growth of minimum wages has declined significantly in Shenzhen area, a good proxy of labour cost for the electronics sector. Moreover, Coface estimates a moderate 2.5% nominal exchange rate appreciation of the RMB against the USD, amidst recovering demand from the advanced economies. With such development, pressure from rising labour cost and currency appreciate should be seen as marginal for 2014.

CHART 11:
Shenzhen minimum wages



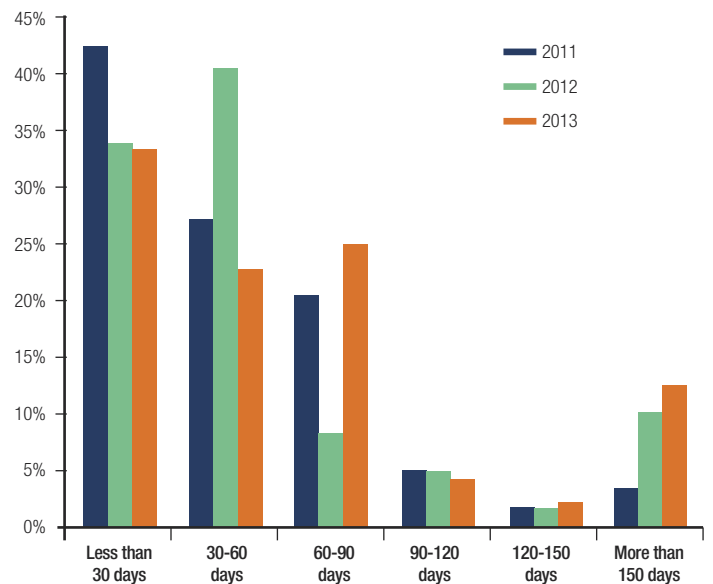
Sources: CEIC, Coface

Nonetheless, stricter environmental standard and affiliated measures would become the biggest headwinds for electronic industry participants in 2014. Government's stricter policy stance on polluting industries - including the removal of subsidies and the government's intention to introduce environment protection tariff in 2014⁽¹⁷⁾- and the proper execution of these policies, will hurt industry participants that have yet followed the existing environmental standards.

Adding to the existing worries about the sector is the worsening payment behavior. According to Coface's recent publication on corporate payment experience in China, there are signs of deterioration in the electronic sectors, including household electronics as well as industrial electronics and machinery sectors⁽¹⁸⁾.

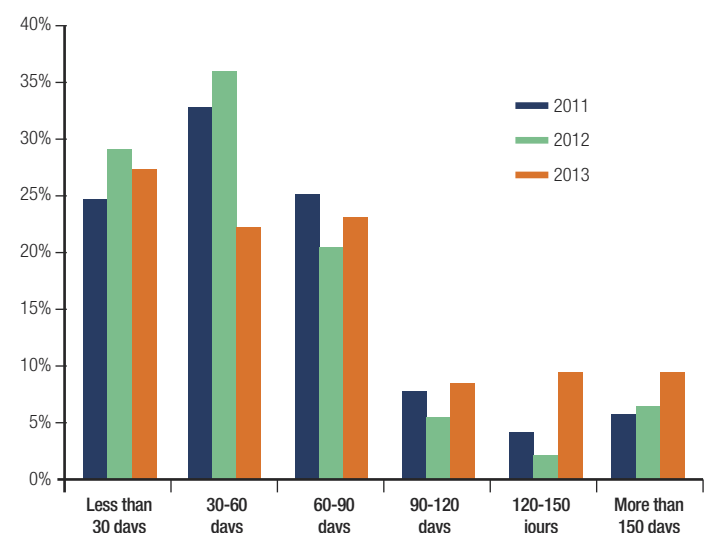
(17) iFeng News (March 2014)
(18) Coface (February 2014)
(19) McKinsey (autumn 2011)

CHART 12:
Average overdue days in household electric/electronic appliances sector in the past 3 years.



Source: Coface China Payment Survey Report 2014

CHART 13:
Average overdue days in industrial machinery and electronics sector in the past 3 years.



Source: Coface China Payment Survey Report 2014

In the aforementioned report, it was indicated that more companies in these sectors in China have experienced long overdue - overdue that has not been settled after 180 days since expiry date of its agreed credit-term. It is Coface's experience that 80% of these overdue payments would not be paid after all and thus investors and business partners have to watch out for these customers.

Particularly, it was mentioned in the report that computer machine manufactures are of higher risk using 2013 data, as the debt-to-equity ratio remained at high level (i.e. 357%), while profitability was razor-thin (i.e. net margin at 2.4%). These indicators are pointing to potential non-payment or deferred behavior of customers in the sector. According to a report by McKinsey (2011), while producing 33% of the total semiconductors in the world, revenue coming from Chinese semiconductor design and selection activities in major companies contributed lower than 4% of total market share⁽¹⁹⁾.

Nevertheless, such trend is set to change – or perhaps, the change is already happening. According to Paul Santabarbara (2011), the technology intensity of Chinese exports has changed drastically between 1995 and 2007⁽²⁰⁾. It is the authors estimate based on COMEXT data that high-tech, medium-tech, and low-tech export weighed 33%, 33% and 34% in 2007 – comparing to 7%, 24%, and 69% in 1995 – respectively. The continuation of such trend is in-line with the policy-tone set by the Chinese Premier, «climb up the value-chain».

C - WHEN COMPETITION FROM MAINLAND CHINA WEIGHS ON OTHER ASIAN PLAYERS ...

FOCUS on the payment experience of Coface in Asia
Christophe Souquet, Coface Group Risk Underwriting Department

If our payment experience in Asia is generally satisfactory, it is worth differentiating it by country:

- **Japan** is probably the country with the lowest level of payment failures in the region. This is partly due to the Japanese corporate culture in which meeting commitments to creditors is essential, particularly if they are also Japanese. Our experience in the electronics/IT sector is good, despite the problems encountered in the last few years by several large Japanese groups in the sector (Sharp, Panasonic, Sony, Olympus...). Their margins on mass market consumer goods (B to C) collapsed due to South Korean and Chinese competition, and they are redirecting their efforts towards higher value-added businesses, mainly in industrial computing (automobile, medical, etc.).

- In **South Korea**, several system integrators recently faced the difficulties of their parent company (it was the case for STX or Tongyang). Belonging to a large group is therefore not necessarily a safety guarantee for creditors. South Korean PC distributors are also undermined by competition from online stores and discounters. Finally, the move abroad of some of Samsung's production centres led to some difficulties for some South Korean suppliers in 2012. Depending too much on a large group can therefore be a liability in some cases.

- In **Hong-Kong** and **Taiwan**: Our payment experience is rather good.

However, the characteristics of these two territories are very different.

Hong Kong companies in the IT/electronics sector are for the most part small, family-owned businesses with very limited financial transparency (not required to publish their financial statements). Payment incidents occur mainly with local distributors (very strong competition between them, price and margin wars). Hong Kong's high dependence on China (its primary market) makes the Hong Kong economy vulnerable to the economic slowdown of its powerful neighbour. This dependence has increased now that all of Hong Kong's industry has moved to China. It is particularly true of the IT/electronics sector (mainly the Guangdong province). Hong Kong companies now face tremendous competition from their Chinese counterparts.

It is also with China that Taiwanese companies face increasing problems.

Taiwan's share of world production is still 75% for PCs, 25% for semi-conductors, and 20% for mobile phones. It is increasingly tied to its large Chinese neighbour, either through the location in China of its production centres or

through exports into the mainland (which will be either re-exported towards the USA and the European Union, or sold on the Chinese market).

Taiwanese companies are larger than their Hong Kong counterparts and located higher up the production chain.

The most famous example is Foxconn (Hon Hai group), which is a supplier to most smartphone manufacturers.

These companies are highly dependent on the activity level of their customers, who are themselves heavily impacted by both domestic (China) and foreign (United States, Europe, and increasingly Asia) demand.

Our payment experience in Taiwan remains rather good but we observe however late payments on sales by Taiwanese companies to their Chinese counterparts.

• Mainland China

As highlighted in the Coface 2013 survey of the payment behaviour of local companies, we are seeing a lengthening of payment terms in this country. 82% of the Chinese companies surveyed by Coface have experienced late payments last year. The IT/electronics sector features among the hardest hit.

It is mainly composed of private companies.

These companies suffer from the economic slowdown seen in China and from the tightening of bank credit towards the private sector, which contributes to the development of alternative financing, mainly inter-company financing. «Shadow banking» is responsible for the failure of many companies (mainly small, family-owned) incapable of paying back loans granted at excessively high interest rates. We estimate in fact that debt in the private Chinese sector has gone from 129% of GDP in 2008 to 200% today.

Another important problem in China is the poor quality of information (difficult access to the financial statements of Chinese companies, opaque accounting, lack of centralised data on corporate payment incidents, etc.), as well as a difficult corporate environment for creditors (namely in terms of legal protection).

The increasing importance of Internet sales in China (Alibaba, Tencent, etc.) has also undermined the traditional distribution of consumer IT/electronics, forcing the leaders Suning and Gome to revise their commercial approach and to develop their own e-commerce platforms.

- In **South-East Asia**, we differentiate between saturated markets (Singapore), mature markets (Thailand, Malaysia) and emerging markets (Indonesia, Vietnam, Philippines, India).

• Singapore

The Singaporean market is saturated. The city-state can no longer compete with its neighbours on low cost products. Vietnamese competition is, in this respect, a good example.

Singapore is therefore focused on advanced technology and high value-added products, with government support for investment in technology and R&D (creation of clusters for instance).

Here also, it's very high dependence on exports makes the Singaporean economy very sensitive to a slowdown in global demand. The payment experience in Singapore is rather good. This country probably offers the most transparent business environment in all of Asia to investors and creditors.

(20) Pula et Santabarbara (mars 2011)

• **Malaysia**

Malaysia has been moving up the value chain for the last ten years.

Many foreign groups (United States, Europe, Japan, Singapore) have established themselves locally, benefiting from tax incentives on investment.

Our payment experience is adequate, although it is marred by rather frequent trade disputes.

• **Thailand**

It is one of the main investment centres of Asian electronic IT groups (including Japanese groups based there for several decades).

Specialised in electronic components, the Thai industry caters to diverse markets such as automobiles, telecoms, IT, etc.

It benefits from a premium geographic location and a qualified work force.

Frequent political turmoil and natural disasters (floods) have not yet significantly impacted our payment experience, even though they erode foreign investors' confidence in this country.

The main payment failures occur with consumer product distributors (consumer IT, televisions, cameras facing increased competition from Smartphones) because of fierce competition

on prices and margins, and often high debt levels. They also put a lot of pressure on their suppliers to sell products (while domestic demand tends to decline). Finally, the introduction of new high-tech products undermines the sale of products such as cameras and GPS (that compete with Smartphones) or PC/laptops (replaced by tablets).

It is not rare to see Thai corporate leaders disappear overnight, overwhelmed by debts and unable to meet their payments.

Boosted by very strong internal demand and the emergence of a middle class, Indonesia, the Philippines, and Vietnam are experiencing an IT/electronics/telecom boom. The penetration rate of high-tech products in these countries is still low, even though it is growing very rapidly. It is the case for mobile telephony for instance, where a group like Samsung is very aggressive. Our payment experience is for the time being rather adequate, particularly in the private sector. However, the lack of corporate financial transparency and a difficult business environment (corruption) make it difficult to assess credit risk.

Additionally, these markets are very fragmented, highly competitive (hence often suffering from very weak margins), and consolidation is unavoidable in the months and years to come.

Finally, local companies still have very limited access to bank financing, which significantly hampers their capacity to develop.

Beyond the importance of corporate strategies, political and regulatory changes have modified the environment electronics companies operate in. Governments are increasingly aware that attracting companies in this field generates qualified jobs. The Information Technology Agreement (ITA, signed in 1996), which allows for reduced tariff barriers, has driven the sector's globalisation.

The market share of segments related to ICTs represents two thirds of the world economy but they do not drive the most growth.

On-board electronics in fact (automobile and aeronautics) will be the key growth driver. The challenge will be to meet the growing demand of emerging consumers who want to consume: the growth of the auto market will continue as a result of the rising purchasing power of Asian consumers. The next generation of planes reaching the market will be even more highly equipped with electronics. Electronics for the medical sector are gathering positive momentum: the aging population of developed markets, the miniaturisation of devices (scanners, mobile terminals).

TABLE 5:
Electronic equipment production growth rate per end-sectors

	2012	2013	2014	2015	2016	2017	CAGR 2012-2017
Aerospatial, defense and security	1.7%	2.6%	3.0%	5.4%	5.0%	5.5%	4.3%
Audio-Video	-8.7%	-1.0%	-4.3%	-0.2%	4.9%	0.6%	-2.0%
Automotive	4.9%	5.0%	6.1%	7.0%	8.2%	8.9%	7.0%
Data processing	2,4%	-0,3%	3,2%	1,1%	1,2%	0,5%	1,1%
Home appliances	6.4%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Industrial et medical	2.6%	3.5%	7.8%	6.9%	7.2%	7.3%	6.5%
Telecoms	5.2%	3.5%	2.1%	3.1%	3.7%	1.8%	2.8%
World	2.2%	2.2%	3.2%	3.6%	3.5%	3.6%	3.2%

Sources: Cabinet DECISION, World Electronic industries 2012-2017 (March 2014)

Questions to Dr. Michel Levy

Telecom Paris-Tech (1975)

Michel Levy teaches the seminar on «Innovation in Telecommunications» at Télécom Paris-Tech. He is a coach with the Paris-Tech Incubator and member of the Board of Directors of the operator Hub One.

- Do you think that we are entering a new stage in innovation, that is to say that we have moved from a period when technological innovations directed the market to one where it is innovation in terms of new services that directs the market and consequently the resulting (hard & soft) technological innovations?

Absolutely: let's take the example of Smartphones: what the user notices is the service that he receives. And that's where the main innovation lies. Indeed, the implementation of these services, for example global positioning, search engines, etc., requires technological innovations, such as an increase in the speed available in mobile phone networks and the application servers that stock and manage the information. Without such services, these technological innovations, which often precede them, would not necessarily have as much relevance.

- Do you think that we are moving towards products with higher added value and that this will result in a redistribution of the major players in the sector?

Yes, certainly. The information and communication technologies sector can be segmented into five categories. While in the 1990s, the dominant players were operators and network services providers, the latter have seen their influence and therefore their relative market share reduced over the period 2000-2010 in favour of new players such as the Over-the-Tops⁽²¹⁾ which hold around one third of the market, and are generators of added value and often have sizeable cash flow. Among them are Google, Microsoft and Apple. On the opposite side, we find manufacturers of semi-conductors who through their more complex offering, have seen their relative market share increase and hold around a fifth of the latter. Network equipment suppliers which have maintained their position on the market are dominated by several large players, such as Apple and Samsung, and are often followed by diversifying network suppliers such as Huawei.

- Component manufacturers such as Samsung, Intel and TSM account for more than 50% of investment between them in production capacity in 2014. Will they have the means to finance this medium- and long-term investment race? Are alliances possible?

Yes, component manufacturers continue to grow. My personal view: 20 years ago, they tested their specifications at system integrators, which focused on innovation and specifying their needs. Now component manufacturers increasingly integrate complex functions, such as a Modem ADSL and a femto base

station, and offer modules using their components. Many can be programmed by their customers, thus increasing the added value of suppliers.

- Regarding China's change of course, illustrated by ZTE dedicating over 10% of its annual budget to R&D and more than 30% of its workforce to basic research, is there a new redistribution of the roles of the different countries in the Asia zone, with redeployment, for consumer goods, towards low-wage countries such as Vietnam and Indonesia?

Regarding Asia, it has for a long time been claimed that innovation is in South Korea, Japan and Singapore, with China's role being to manufacture. This is less and less the case; high-tech Chinese companies, Chinese start-ups are now at the forefront. Taking for example Tencent, based in Shenzhen, offering the world an equivalent to Whatsapp named WeChat. And it is the same in other high-tech areas, such as medical, M2M, etc.

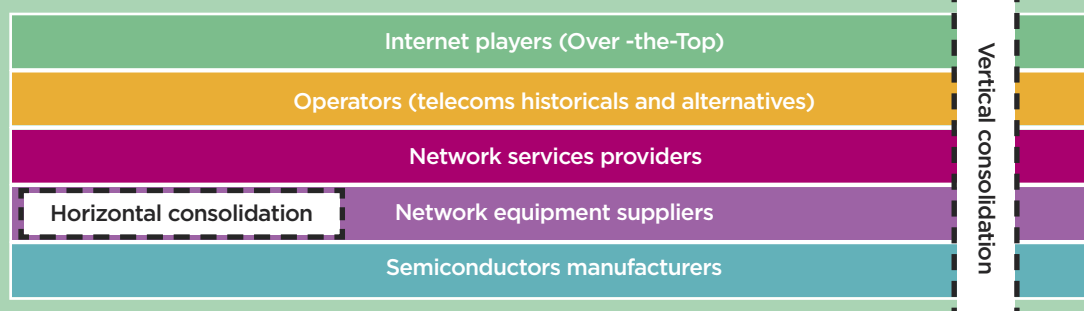
- Asia is usually associated with the electronics industry, what is the place of Europe in the innovation race? As a coach of the Paris Tech Incubator, what are the major trends in innovation?

Europe plays a major role in the innovation field, through training of its researchers and engineers, who are recognised worldwide. One problem is the brain drain to the United States. An example is a recent deployment of MOOCs (Massive Open Online Courses) that identifies the best talent in the world, and offers them attractive scholarships. So we must be careful.

Major trends are mobile/Smartphone apps, Cloud architectures, and Machine-to-Machine (M2M)/Internet of Things, Big Data, and robotics/artificial intelligence. And all components must be linked, such as remotely managed communicating objects from servers that store and process information through Cloud-type architecture and therefore more efficient telecommunications networks (3G-4G).

One of the innovation catalysts is the permanent connection of individuals and objects. Constantly new applications and technological innovations to enable them, unceasing progress in the integration of components to develop embedded and communicating electronics. This is what we find in the ParisTech Incubator, and more generally in the ecosystem which includes engineering colleges/universities, incubators and industrial partners that can transcend the innovation of a start-up in an industry with manufacturing methods, cost optimisations, etc.

CONSOLIDATION IS ON ITS WAY



Source: Michel Lévy, Innovation, Nouveaux Services et modèles d'affaires dans les télécommunications

(21) Sofrecom (a subsidiary of Orange) defines Over-the-Tops or OTTs as holding a strategic position in a value chain. OTT providers use existing structures installed by another player to provide a service.

CONCLUSION

The Asian players of the electronics industry were very profitable up until the years 2000 because their manufacturing was essentially aimed at low value-added products. As they move up the value chain, medium-sized players are reporting slower turnover growth, particularly compared to sector majors, and their margins are negatively affected. As such, they suffer from the market power of the very large players. They must in fact continue the process of moving up the value chain and pursue their efforts in research and development. This need to invest massively combined with slower growth keeps margins under pressure in the short term. Medium-sized

players also suffer from lower growth prospects in the main advanced economies and particularly in China. To emerge from this bad patch, the Asian electronics industry must reinvent itself. The region can rely on its many assets to bounce back. The importance given to innovation in the face of increasingly rapid product obsolescence, their capacity to adapt to versatile consumers, and the fact that they have learned to bridge the gap between them and the large groups, should enable these medium-sized companies to remain among the front runners.

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