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The Eight
Overarching China
Automotive Trends
That Are Revolutionizing
the Auto Industry
Part 1



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EXECUTIVE SUMMARY

In our judgment, China is the catalyst behind the restructuring currently underway in global automotive industry. Many industry experts believe the automotive industry is undergoing change as a result of the global economic crisis, which has little to do with China. Still others believe that the restructuring is a result of mismanagement and that major OEMs can be restored to greatness with a change to new leadership possessing sufficient vision to adopt a new course.

We believe that recent events signal the early stages of an economic revolution: a shift of the global center of gravity of economic strength towards the east, which will result in profound changes in numerous industries. As an economic bellwether, the automotive industry captures a great deal of interest. However, it is apparent that there are many who still do not comprehend that the changes underway are in fact fundamental and irreversible.

It is apparent that more explanation is needed for many to grasp the idea that China is the catalyst for this automotive revolution, and that the opportunity exists for China and its fledgling automotive companies to assume a leadership role in the 21st century automotive industry. This explanation will be offered by highlighting eight overarching

trends that are shaping the China automotive industry: now the largest in the world and the new battleground for domination of the global auto industry.

Eight Overarching China Automotive Trends:

1. Policy-driven Consolidation of Chinese Vehicle Manufacturers
2. Global Redistribution of Assets by Non-Chinese Companies to Capture China Market Growth
3. Acquisition of Foreign Assets and Key Development Competencies by Chinese Companies
4. China's Investment in New Energy Vehicles and Related Infrastructure
5. Utilization of China's Automotive Capacities for Global Expansion
6. Hyper-Competition Across the China Automotive Market Segments

7. China Vehicle Manufacturer's Push to Build Brand Equity
8. China's Rapidly Changing Demographics and Growing Demand in Lower Tier Cities

The cumulative impact of these trends is essentially revolutionizing the business model of the global automotive industry. We will elaborate further on each of these trends in this two-part series of articles.

TREND #1: POLICY-DRIVEN CONSOLIDATION OF CHINESE VEHICLE MANUFACTURERS

There have recently been many announcements regarding potential mergers and alliances among the China domestic vehicle manufacturers, including Beijing Automotive Industry Corp (BAIC) and Fujian Daimler, Guangzhou Automobile Group Co. (GAC) and Zhejiang Gonow Auto, Chery Automotive and Jianghuai Automobile Co. (JAC), Dongfeng Motors investment in Yulon's Luxgen (Hangzhou) Motor Co., and First Auto Works (FAW) and Brilliance Auto.

The rationale for this major restructuring is clear: the current structure of the automotive industry reflects an industry in its early stage of development. There are more than 150 registered vehicle manufacturers in China. In 2008, only 10 of these manufacturers accounted for 83%

of the vehicles sold. This highly fragmented structure cannot provide for a stable development of the current domestic players.

As a result, the Chinese government has pulled-ahead its plan to consolidate the vehicle manufacturer landscape in order to achieve economies of scale. Prompted by the economic crisis, the China government in January 2009 published stimulus plans for 10 key industries including automotive. The most sweeping proposal in this plan is the intention to consolidate the industry into a "top 10" group organized into 2 distinct "tiers": the Tier 1 group consisting of companies with an annual capacity of 2 million units that are encouraged to acquire smaller automotive companies throughout China, whereas Tier 2 consists of companies with an

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annual capacity of 1 million units that are encouraged to drive regional consolidation. The plan even names 4 Tier 1 companies as well as 4 Tier 2 companies:

Tier 1

- Shanghai Automotive Industrial Corporation (SAIC)
- First Auto Works (FAW) Group
- Dongfeng Automobile
- Chang'An Automotive

Tier 2

- Beijing Automotive Industrial Corporation (BAIC)
- Guangzhou Automotive Industrial Group (GAIG)
- Chery Automobile
- China Heavy Duty Truck Corporation (CNHTC)

It is noteworthy that this is not a final list of surviving companies as it represents only 8 of the “top 10”, and by calling it “top” 10 there is

obviously room for others below the “top”. One can anticipate that OEM consolidation and rationalization will surely be accompanied by a major restructuring of the Chinese auto supply base. It is also noteworthy that companies such as BYD, Geely and Great Wall are not included on the list. In spite of this, there is a clear indication of the rationale and urgency around the issue of consolidation, and why the time to act is now.

But, how does a restructuring of the domestic structure in a single auto market revolutionize the global auto industry? Taken as a stand-alone trend, it certainly is not sufficient enough to unleash a global transformational force. However, one must consider the fact that we are talking about the largest and still rapidly expanding China auto market. By seizing on the financial crisis as a triggering event to drive

forward the necessary consolidation, the China government is ensuring that it can more efficiently develop the industry around the fewer, and stronger auto groups that remain. This is a necessary foundation-building step from which fewer, yet stronger China auto companies can emerge. While providing a base, it is the cumulative impact of this trend along with the remaining seven yet to be described that will revolutionize the business model of the global automotive industry.

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TREND #2: GLOBAL REDISTRIBUTION OF ASSETS BY NON-CHINESE COMPANIES TO CAPTURE CHINA MARKET GROWTH

We are fortunate to be living in historic times. While in the grip of the most severe economic contraction since the 1930s, it is in such times—and only in such times—that truly transformational structural change is possible. The global car industry has long suffered from overcapacity resulting from overly ambitious assumptions for market growth combined with optimism surrounding whatever product or technology was being offered. Ambition and optimism are the first victims of a recession as businesses struggle to realign to a new world economic order. This translates into a major redirection in capital spending and asset reallocation as businesses attempt to reconfigure themselves in order to regain a profitable footing. Many businesses are reallocating assets from slower to higher growth markets, or otherwise selling assets or disposing assets deployed in their weakened home markets.

It is interesting to note how the financial crisis—while impacting the entire global economy—has been felt to varying degrees in different markets. While GDP declines are anticipated for 2009 in the Euro Zone, the US, and Japan, stimulus measures taken in China have yielded remarkable growth in many sectors of its economy. China's stimulus plan provided UD \$588 Bn of investment,

of which 45% was targeted at infrastructure development. The Auto Industry Revitalization Plan implemented in March 2009 included specific measures to spark consumer demand for automobiles, including:

1. Establishment of eight development goals for the industry from 2009 to 2011 to ensure domestic growth of automobile production and sales
2. Reduction of half of sales tax for 1.6 liter or smaller cars
3. Implementation of policies to boost auto sales in the countryside including subsidy for new minibus or light truck sales for rural residents

All indicators point to the likelihood that China will exceed its 8% GDP growth target in 2009. Taken in the context of a longer time horizon, it is also apparent that in the past three decades, the major Asian growth economies of China and India are in fact returning towards their historic share of world GDP. The net result of these developments has been a significant redistribution of the relative strength of the global automotive markets.

In fact, China has surpassed the US in automotive sales for each of the first 6 months of 2009, selling 6.1 million vehicles over this period compared with 4.8 million new vehicles in the

US. In fact, since 2003 China's vehicle market has more than doubled in size from 4.56 million units to 9.67 million units (in 2008). Of this total, 61%, or 5.91 million units, represent passenger vehicles (exclude the buses, trucks and other commercial vehicles). The China Association of Automobile Manufacturers forecasts sales for 2009 will top 12 million vehicles. Given recent developments, China will easily surpass the U.S. market in sales for the overall calendar year 2009.

Looking forward, Global Insight has forecasted that the Asian markets represent the largest growth potential in the global auto industry with a combined 4.7% compound annual growth rate over the next 10 years (compared with 2.9% in NAFTA). Within Asia, 54% of that growth is expected to come from China. As a result of these developments, the global automotive industry must fundamentally rethink its structure in terms of regional allocation of capital investment and capacity.

Global automotive companies have been forced to radically and often

involuntarily rethink their global footprint. For example, General Motors spent a great deal of time navigating the process of completely unwinding its European operations with an effort to sell its Opel, Vauxhall and Saab brands. In their North American operations, GM is in the process of selling its Hummer and Saturn brands, and terminating the Oldsmobile and Pontiac brands. At the same time, GM has continued to invest in expanding its capacity in the rapidly growing China market. Similarly, Ford has sold its Land Rover and Jaguar brands to Tata Automotive, and is in the process of selling the Volvo brand while simultaneously expanding their China product portfolio.

Perhaps the most impressive example of this trend is seen with Volkswagen AG. Historically the market share leader in China, the world's third largest automaker recently announced that it sold a record 652,222 vehicles in China and Hong Kong in the first half of 2009, up 22.7% year on year. For Volkswagen, this makes China its biggest auto market worldwide for the first time. VW has achieved

these results by bringing their most advanced vehicle and powertrain technology to the China market, having recently launched their 1.4–2.0L TSI engine family. With additional plans to introduce their DSG gearbox, VW is poised to take full advantage of the growth in sales of compact cars. VW will continue to bolster their strength in the market this year, with plans to introduce the all-new Volkswagen Golf, along with plans to start manufacturing two new SUV models in its plants in eastern Nanjing and western Chengdu. In May, Volkswagen formed a partnership with China's BYD Co. to jointly develop hybrid and electric vehicles powered by lithium-ion batteries, becoming BYD's first industrial partner.

Clearly, the global center of gravity of automotive strength has shifted east. Those manufacturers who have anticipated this trend and are providing market-relevant products will continue to reap the benefits as the China market continues its inexorable expansion.

TREND #3: ACQUISITION OF FOREIGN ASSETS AND KEY DEVELOPMENT COMPETENCIES BY CHINESE COMPANIES

As previously noted, the highly fragmented nature of the domestic Chinese auto industry presents challenges to the longer-term development of the domestic industry. The fact that there are over 150 registered manufacturers is an outgrowth of a start-up phase for China's auto sector. Provincial governments, with the support of the central government, were encouraged to develop industrial bases to create investment opportunities and jobs in order to accelerate China's economic development. However, the highly fragmented industry that results from this creates enormous inefficiencies in the area of capital investment. This fragmentation also makes it very difficult to focus and allocate resources to the development of critical technologies related to safety and fuel economy. This is an area of particular weakness for Chinese OEMs who have relied on their foreign partners to lead the development of key component technologies.

While the China policy makers have prioritized the need for strengthening its industry via consolidation of the domestic players, the simple fact is that the global financial crisis has created a need to rethink the global allocation of automotive assets. As previously noted, many non-Chinese manufacturers are shifting their focus

from their domestic markets to the growth markets like China. However, many are in a position to dispose of assets that are no longer critical to the business going forward. The historic restructuring underway in the global automotive industry will undoubtedly result in a redistribution or liquidation of automotive OEM assets. Whole companies, brands with installed dealer networks, product platforms and associated component technologies are all available for a mere fraction of the investment needed to create these assets. It stands to reason that such an "inorganic" approach to development could significantly shorten the time frame for going global.

While Chinese firms have learned very quickly how to assemble cars and develop supply chains, they are very inexperienced at the vehicle development and synthesis process. An automobile is a complex engineered system requiring advanced technology and know-how in order to test and validate the achievement of benchmark targets in the areas of performance, fuel economy, safety and quality. It is in this area that Chinese firms are weakest. Chinese vehicles, while improving rapidly, are still not up to the world-class standards required to compete in the mature markets of the world.

As a result, numerous Chinese firms are seeking opportunities to acquire foreign assets for a fraction of the cost of their original development. Many noteworthy examples include the potential sale of Ford's Volvo brand, GM's Opel and Hummer brands, and Chrysler's discontinued products and powertrains. While China's policy makers have urged caution in bids with the Big 3, they remain supportive of deals that bring critical technologies to the domestic industry. Such deals include Geely's planned acquisition of Volvo, as well as Geely's \$58M acquisition of Australian transmission manufacturer Drivetrain Systems International.

By acquiring the assets of a distressed but well-known international manufacturer, Chinese auto companies are hoping to significantly accelerate their development and expansion plans. Chinese companies with global ambitions who are considering a major acquisition would do well to study the lessons learned from those who have tried to

create a cross-border alliance. While it may be relatively easy to negotiate a deal to acquire such assets, there is enormous risk and the vast majority of cross-border acquisitions ultimately fail. The most recent case of SAIC's acquisition of Ssangyong ultimately failed because the interests of both parties were not aligned. SAIC was unable to secure concessions from Ssangyong's labor union to lower costs, unwilling to inject billions of RMB incremental capital to fund the business, and unable to manage the loss of leadership at Ssangyong. Ultimately, SAIC decided to dissolve the deal. Sadly, cross-border acquisitions are rarely successful. The 9-year marriage of Daimler-Benz and Chrysler dissolved in 2007 largely driven by an incompatibility of products, brands, business models and management structures.

Even the more successful partnerships have had mixed results: by all measures, the Ford alliance with Mazda has been a very good example of a successful cross-border alliance.

Ford benefited from access to Mazda's fuel-efficient technologies and platforms, and both sides benefited from a shared global production and distribution footprint. However, Ford recently made the decision to liquidate its shares in Mazda in order to raise much-needed cash. Lenovo's acquisition of IBM's PC division is largely viewed as a success because of the compatible interests of both sides, but had to overcome challenges from the US authorities fearful of national security risks. It remains to be seen if the merged company will be a stronger competitor in a highly competitive electronics industry.

Clearly there is a need, on the part of the European and North American OEMs and suppliers, to find additional sources of funding in order to keep their operations going, while the rapid growth of China auto market in recent years has provided Chinese companies more capacity to invest. The shifting of economic and industrial power to the east will require a corresponding redistribution

of the asset base of the industry. However, there are real challenges in finding suitable partners. Partners in the west are not necessarily going to be compatible, both from a technological and from a cultural standpoint with a Chinese suitor. A Chinese company investing in a western company or its assets must understand how to align the interests of the partner in the transaction with their own, or they will likely end up owning assets without the technological development know-how that went into creating those assets.

It all should start with a comprehensive risk-assessment and plan for post-acquisition integration. The risk-assessment should encompass the following high-failure rate causes:

Lack of Synergy

- Limited complementarities among target markets and customers
- Significant complexity in sharing

resources/technological capacities

- Difficult to jointly develop new concept or product platform for global sales

Political/Legal Risks

- Anti-trust restrictions and strict audit by in-country government
- Potential resistance from public and other stakeholders who have interest or deep-rooted connections with the acquired brand/company
- Potential objection from national security authority if company is military supplier

Financial Risks

- Capital investment requirements in transition process
- Increased cost level by resulting from increased capacity and staffing

Operational Risks

- Shortage of qualified management with international experience

- Difficulties to integrate the parent company's systems with the acquired company

Cultural Risks

- Conflicts caused by huge differences in language, culture and values
- Misunderstanding and failure due to ineffective communications

Successfully anticipating these issues and developing a post-acquisition plan for asset integration will increase the success rate and ensure that technology transfer could then happen in the context of the new partnership. While there is every reason to doubt that Chinese domestic firms are ready to take on a foreign acquisition, it is happening. Those who dare take on such acquisitions are also wise to learn the lessons from others who have tried—and often failed—to use an acquisition to accelerate the process.

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TREND #4: CHINA'S INVESTMENT IN NEW ENERGY VEHICLES AND RELATED INFRASTRUCTURE

Several macroeconomic and sociopolitical challenges are directly linked with the automotive industry: the redistribution of global economic power, energy dependence, global trade balance and environmental concerns. The rapid rise of the Asian economies—especially China—are sending shock waves through a system that was already out of balance in many of these areas.

The global economic crisis presents the world with a compelling case for change, and truly transformational changes often occur during times of crisis. The economic crisis is a triggering event that freezes debate on whether change is needed and creates opportunities for collaboration between government and industry. Such collaboration is essential for the successful transition from the conventional internal combustion engine (ICE) to new energy vehicle (NEV) technology.

As we have described in detail previously, the balance of global economic power has been shifting eastward to places like India and particularly China. Most of the recent growth in the world's auto industry has been in the Asia-Pacific region, and more than half of that growth over the next decade is forecasted to

come from China. Since 2003 China's vehicle market has more than doubled in size from 4.56 million units to 9.67 million units in 2008. In this time period, The passenger vehicle (extract the buses, trucks and other commercial vehicles) share has grown from 50% to over 60%.

Given the recent economic downturn, the China government undertook a series of focused stimulus actions designed to help achieve a GDP target of 8%. Through the first half of 2009, these measures already had a dramatic impact on the automotive market as Chinese consumers—many of whom were first time buyers—took advantage of tax and other incentives that were made available. For the first half of 2009, China surpassed the U.S. in total car sales, posting sales of 6.1 million units against 4.8 million vehicles sold in the U.S. from January through June.

China's rapid automotive growth is expected to continue. The market is forecast to account for more than half of the Asia-Pacific market expansion over the next decade, with over 6% annual growth through 2018. As China's auto market continues to grow, pollution significantly increases while China's self-sufficiency rate of crude oil continues to decrease.

To encourage the use of more fuel-efficient and less polluting vehicles, the central government's 2009 stimulus plan included objectives for increasing the proportion of smaller vehicles in the China market. Related initiatives include a 50% reduction in the sales tax for under 1.6-liter vehicles, additional taxes on larger vehicles, and a relaxation of restrictions on small cars. The government's stated objective as part of the plan is to achieve a market share target of 40% for 1.5-liter engine vehicles and below, and a share of 15% for vehicles with engines at or smaller than 1.0-liter. Overall affordability as well as the shift toward consumer versus institutional sales will also continue to support the development of smaller vehicles.

As the size of the auto market inexorably expands, China will play an increasingly key role in the development of new automotive technologies. China's emergence as the leading automotive market in terms of sales has several implications. While most attention has been paid to relative sales performance of the foreign and domestic companies, what is arguably of more long-term significance is the impact of China's market

expansion on energy consumption and environment. Ten years ago, Beijing, Xi'an, Shenyang, Shanghai and Guangzhou were already listed among the Top 10 cities with the worst air pollution. The massive growth of the automotive market only adds to the problem. Additionally, China imports two-thirds of its oil, and its ever-increasing thirst has had a dramatic impact on global energy prices. No doubt, China has a clear and compelling need to reinvent the propulsion technology of the automobile.

To address this, China's stimulus measures are targeting initiatives to increase energy efficiency and reduce greenhouse gas emissions by reducing energy intensity, increasing the share of renewable energy used, implementing tough auto emissions standards, and adding investments for clean energy. China's Minister of Science and Technology, Mr. Wan Gang—a former automotive development engineer for Audi—has recently unveiled a plan to support the development of what China calls "New Energy Vehicles" (NEVs). The Ministry of Science and Technology, working with the Ministry of Finance and the National Development and Reform Commission, is sponsoring an ambitious plan to promote the

use of NEVs initially targeting 13 pilot cities, which include Beijing, Shanghai, Chongqing, Changchun, Dalian, Hangzhou, Jinan, Wuhan, Shenzhen, Hefei, Changsha, Kunming, and Nanchang. The plan includes support for the development of energy-saving technology for use in government fleets, including buses, postal, and sanitation vehicles. The plan targets the deployment of 60,000 energy saving vehicles in China by 2012.

Both universities and vehicle manufacturers have already responded to the government initiatives. For example, Tsinghua University has established an alternative powertrain research lab. Chinese auto brands are participating in NEV development (some with foreign partners) and have included plans in their long-term strategies. Developments include the following:

1. **SAIC:** Invested RMB 2 billion for NEV development
2. **Chang'An:** Established NEV JV and plans first hybrid car for 2009
3. **FAW/DFM:** Have hybrid buses in pilot operation
4. **Chery:** Introduced plans for the hybrid car A5 and electric car S18
5. **BYD:** Introduced plans for the F3DM dual-mode electric car

Replacing internal combustion engines with other technologies—such as hybrid electric, full electric, hydrogen powered vehicles or clean diesel—requires collaboration between business and government to develop the infrastructure in tandem with development of the technology. The economics of the product itself and ultimate market acceptance is very much dependent on the availability of the infrastructure to recharge or replenish the fuel. It's not realistic to expect a company to reinvent the technological underpinnings of the automobile unless there is a concurrent development and investment in the infrastructure to support that new technology vehicle. This is especially true in today's weakened global economy.

As the largest automotive market, and because the China government has the capacity and willingness to invest in the infrastructure for alternative propulsion, the technology will eventually come to the market. What makes the development of alternative

propulsion technology particularly challenging is not simply the vehicle itself - but the need for invention of the infrastructure for delivering renewable sources of electricity and installation of battery charging/replacement stations.

As the largest car market, and the place with the largest need for alternative energy solutions, we can expect to see China place a heavy emphasis on development of the electric vehicle (EV) infrastructure. The country that leads the development of this infrastructure will undoubtedly lead in attracting the investment in development of the technologies that plug in to that infrastructure.

Consumer acceptance of new energy vehicles is yet another challenge. While the infrastructure investments already described will help tip the scales in favor of new energy vehicles, consumers must also be convinced that the price and performance of the new energy vehicle can in fact meet their expectations. As a national

priority, we can expect the China government to help by offering incentives for the retail consumer to purchase new energy vehicles. Chinese consumers have less experience with gasoline-powered cars, and are already accustomed to short distance, low-speed commuting—conditions very favorable for electric cars.

The China government's willingness to invest in the infrastructure to support alternative propulsion technology will ultimately help drive market acceptance. This is where China has the opportunity to take the lead, and that will drive investment in new technology. It takes a combination of business and government working together to make such a transformational change possible – and nowhere in the world is there a closer link between business and government than in China. In the next article in this series, we will complete our look at the remaining “Eight Overarching China Automotive Trends That Are Revolutionizing the Auto Industry”.

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