

Industrial Planning: How the State Directs Capital

Planning Process Post 1998

- Two types: “pillar” industries and “strategic” industries
- The economically influential or “pillar” industries are chosen for the degree to which they stimulate complementary industries.
- The “strategic” industries, which are normally weak or infant industries, are supported through policies of industrial “incubation.”
- Policies are drawn up by the National Reform and Development Commission (NDRC) after consultation with industry associations.

Key Characteristics

- Import-replacement
- Export requirements
- Requirements for localization of components
- Foreign currency balancing
- Restrictions on foreign investment
- Direct subsidization of preferred companies

Example: Autos as a “Pillar” Industry

- Forced equity joint ventures for foreign participants
- 70% domestic components targets
- Scale requirements

SAIC

- Machine Building Minister sought out Volkswagen on a visit to Germany in 1978. In 1979, VW tested assembling CKDs in Shanghai. JV signed 1984.
- SAIC is dissatisfied with the CKD model. Shanghai established a Localization Office to support parts manufacturers. Then-Mayor Zhu Rongji decrees that Shanghai taxis will be Santanas.
- To capture more technology, SAIC in 1997 signs with GM, GM invests \$1.6 bln. GM localizes design, creates local R&D center, and trains SAIC engineers.
- SAIC buys foreign assets like MG Rover and takes equity in subs like Anhui Chery.
- SAIC establishes own brand, Rowe.

Results

- SAIC in total has 23% market share in China, the largest.
- Parts localization has been very successful.
- SAIC revenues dwarfed by international competitors, but growing fast:
 - 2011 SAIC revs: \$69 bln, up 45% YoY
 - 2011 Toyota revs: \$220.86 bln, up 8% YoY
 - Profitability is comparable with Ford, Toyota, GM
- Over 90% of SAIC's sales are from the foreign joint ventures.
- R&D spending has lagged international competitors and both SAIC and foreign automakers say the Shanghai R&D center is not engaged in technical innovation.
- Advantages: government procurement support, spending on NEVs
- SAIC has essentially acted as an OEM partner through the JVs.
- Overall, the autos plan has been successful for the government but not for enterprises.

“Infant” Industry: Software and ICs

- Early 2000s: High proportion of world electronics made in China, low proportion of value

Product	China Production	% of world production
Washing Machines	14.43 million	24%
TV sets	39.36 million	29%
Refrigerators	12.79 million	16%
Air conditioners	18.27 million	30%
Cameras	55.14 million	over 50%
Microwave ovens	12.57 million	30%
VCD players	20 million	70%
DVD players (2003)	82 million	80%
Mobile Telephones	120 million	28%
Telephones	95.98 million	over 50%
Notebook computers	380,000	12%
Monitors	45.9 million	42%
Radios	240 million	70%
Disposable batteries	17 billion	40%

Preconditions

- WTO accession 2001: lower tariffs, market access for competitive international distributors, and the general promise of growth in several sectors that consume ICs.
- ITA: zero-level tariffs on high-tech equipment
- The WTO agreement also promised to phase in trading and distribution rights for foreign firms and to remove technology-transfer and export requirements as conditions of investment approval
- Phase-out of technology-transfer restrictions under Cocom

Foundries

- Initially, policy focused on foundries, a la Taiwanese model.
- Many policy incentives were put in place, and contracted investment in fabs being built during the 10th Five Year Plan, from 2001-2005, swelled to about \$14 billion, which roughly quadruples the total investment in the manufacturing sector for the previous 30 years.

Goals

- To reach large-scale production levels for 0.8-micron, six-inch wafer technology
- To begin production of 0.5-micron, eight-inch wafer technology
- To increase IC design capabilities to encompass the whole range of IC products demanded by the Chinese electronics sector.
- To reach 0.3 micron and advanced packaging technology in research and development centers.
- To develop eight-inch single crystal wafer technology and begin domestic production
- Increasing the level and output of the discrete device industry with the aim of becoming a net exporter of these devices by 2000.

Means

- The 909 Project: 9.8 billion Renminbi in allocations, plus establishment of five major IC production companies and as many as 20 design and development centers by the year 2000
- “Policies for Encouraging the Development of Software and Integrated Circuit (IC) Industries” (State Council Document 18): rebate on VAT for domestic sales of ICs and software, policies to promote financing and market floats of IC and software businesses
- Shanghai implementation documents: direct subsidies, tax breaks, industrial parks

Investment Accelerates

- Between 2000 and 2001, capital spending by IC companies increased by more than 100%.
- Investment in design houses between 2000 and June 2003 was \$2.5 billion, with 300 new design houses established in that period.
- About \$14 billion in investment was committed to the foundries that broke ground between 2001 and 2003. This compares to roughly \$3.11 billion invested in the semiconductor industry between 1980 and 1999.

Official Achievements

Technology	Developer	Explanation	Status
Longxin (Godson) Series (龙芯) Arca 1-3 CPU (方舟)	CAS Computer Institute and a consortium including Haier, Great Wall, and Legend Arca Technologies (Fangzhou) Fudan University	CPU chip for net computing 400MHz, 32-bit CPU	in mass production in mass production in mass production
Shenwei 1 (神威)	Microelectronics Lab Shanghai Jiaotong University/Shanghai	32-bit CISC microprocessor	in mass production
Hanxin-1 (汉芯) RFIC Patriot Series (爱国者)	Broadband Technology Nanjing Southeastern University Hai'er	18-micron DSP chip radio-frequency IC chip with maximum speed of 40 Gbps Chips for set-top boxes	in mass production testing in mass production
Yanhuang (炎黄) Qingdao (青岛) S698	Chengdu Westar Beijing University Jade Bird China Toptech (Shenzhen) Peking University Microprocessor Research and Development Center/PKU Unity	Digital TV display chip Embedded 16-bit RISC CPU processor Embedded 32-bit CPU processor	testing prototype prototype
Unity (众志成城)	Microsystems	System-on-a-chip CPU	in mass production in mass production
Xingguang (星光) Wantong (万通)	Vimicro LHWT	Digital multimedia CPU chip Wireless LAN baseband chip	production testing

Green Tech



Promotion of Solar, Wind, and Biothermal Power

- Use of VAT rebates
- Government procurement
- Golden Sun Project, FIT
- Tax benefits
- Low-interest loans
- Preferential access to capital

Results

- Wind turbine technology acquisitions but failure in commercialization
- Low grid connection rate for wind
- Solar: Chinese module capacity now at about 36GW, world demand at about 18 GW
- Price below cost for most players

Hogs



Policy Focus on Slaughterhouses

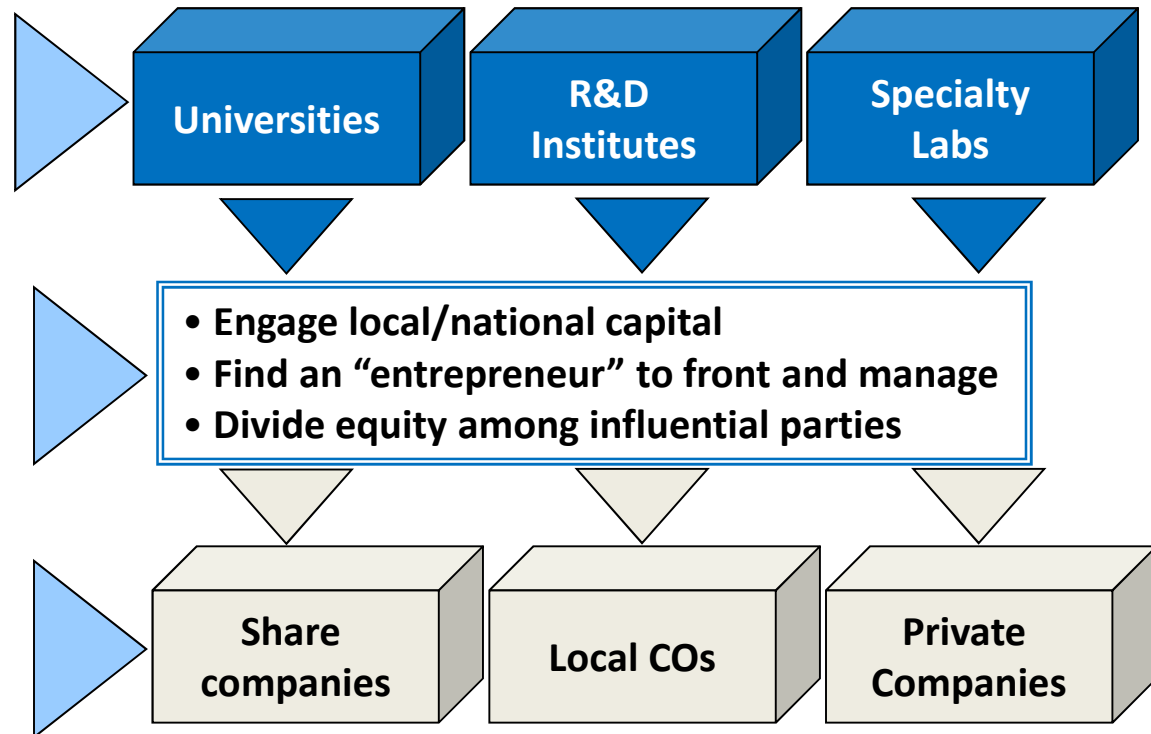
- Massive capacity build by players like Shineway, Yurun, Zhongpin
- But supply of hogs is highly disaggregated
- Most companies have turned to using the subsidy programs to invest in real estate.

Legacy problems from the planned economy erode efficiency of R&D investment

Inadequate R&D budgeting in all sectors pressures R&D entities to overstate accomplishments, prematurely declare developments, and distort test results

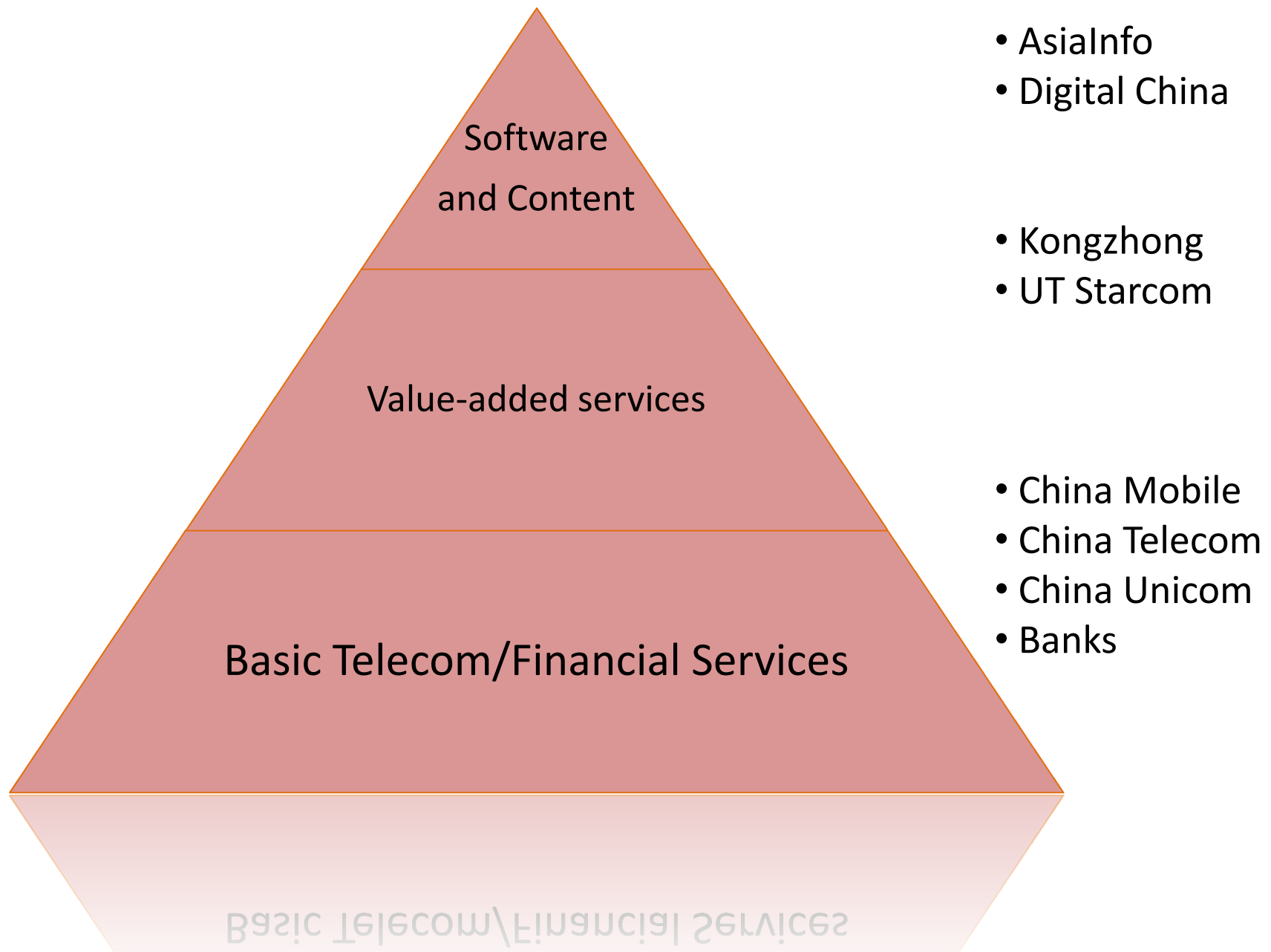
Because of the weakness in IP protection, developers of IP try to own the commercializing entity directly, as the surest way to derive some benefit

Highly political and unchecked capital allocation practices at local level result in construction of dead-end facilities with unviable or uncommercial technologies



Reference examples of resource misallocation: TD-SCDMA, or WAPI, or crystalline solar, or NEVs, or . . .

Businesses living in the value chain of the big SOEs can make money but are essentially client industries and thus captive to cyclical investment ebbs and flows



The “client” system spawns cost-based competition

- ✓ Service-based tech businesses selling to the export market find the most secure margins and can develop solid technology.
- ✓ Ex: VancelInfo, Camelot, Rockwell, Siemens, Emerson
- ✓ Selling domestically, service-based tech businesses over time find growing competition, margin squeeze, and poor differentiation.
- ✓ China Automation, Hollysys
- ✓ Vimicro
- ✓ Digital China
- ✓ A fundamental reason is that domestic companies often must get their start by making “insider” sales to supportive government agencies or SOEs. As the industry grows, new patrons sponsor new client companies, while existing players, too dependent on monopsony buyers and subsidies, fail to develop solid technology.

Implications for the tech economy

The Weakening Of The Private Sector

- Most critically needed for consumption growth is private enterprise, and that is what is most politically difficult to achieve.
- A strong recentralization theme lurks behind many FYP policy directions – e.g. steel, mining, logistics. The coal resources of Shanxi were dramatically returned to the control of large government enterprises (Poly Holdings, CITIC and Shenhua) after several years of successful privatization, and the creation of many wealthy families

Lack of incentive for efficiency retards tech

- IT penetration into business in logistics, marketing, inventory management, etc. has been weak
- The government hampers information exchange, which would otherwise drive online efficiencies

The Realities of Green Growth

- Plan envisions 5 trillion RMB investment in alternative energy; but a close read indicates that much of this is expected to be provided by private investors
- The plan actually will increase the use of fossil fuels, by re-powering the big SOEs in fossil fuels, restructuring energy pricing, and opening up huge reserves in Xinjiang and Inner Mongolia
- Electric autos are a major focus, but the investment will lead to massive over capacity.

Be careful what you wish for

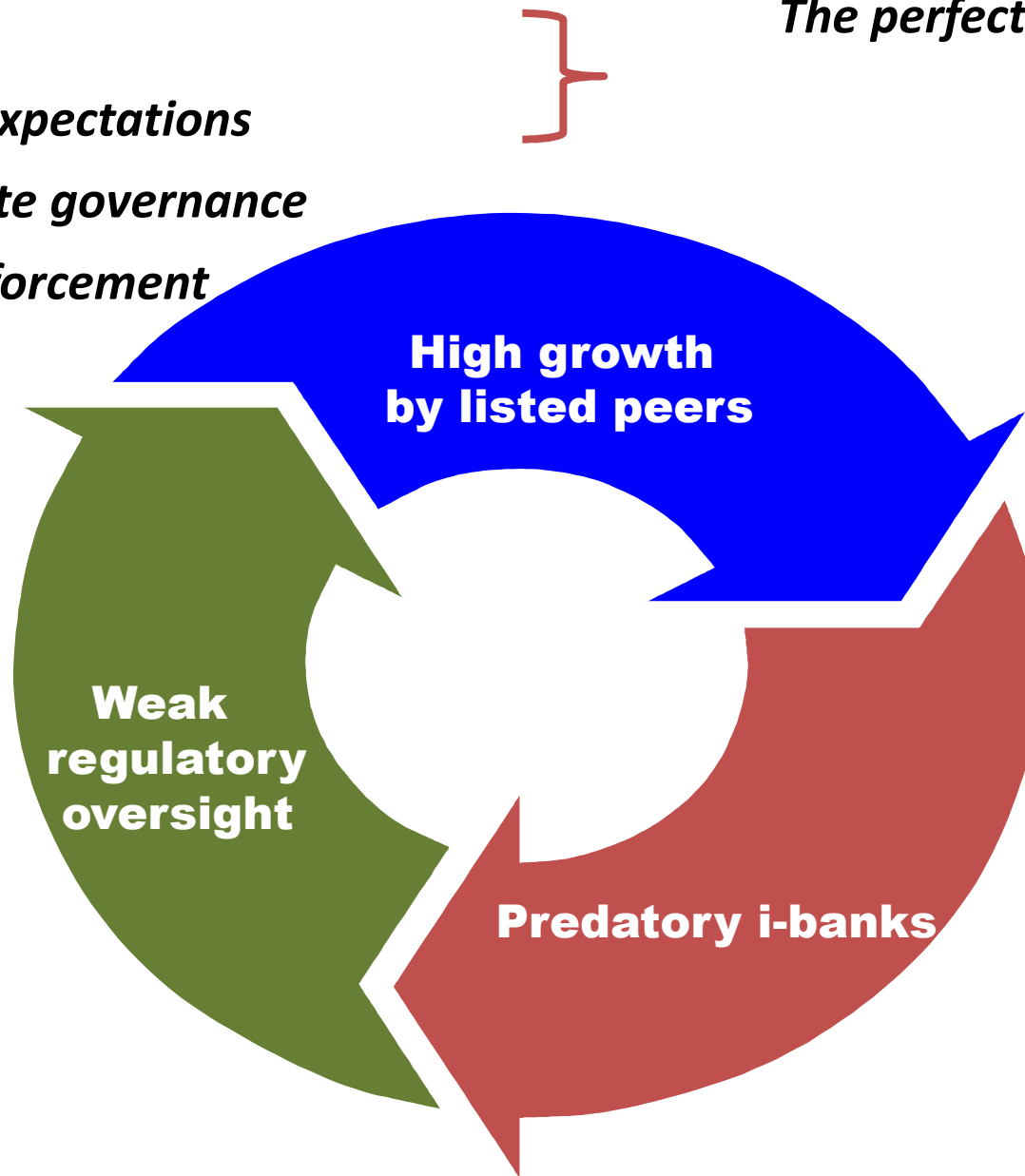
The support programs for tech have generally had a deleterious effect on technological development.

- The supports for semiconductors and software in reality represent a retreat from direct subsidies: the chief subsidies in electronics are now aimed at supporting the consumer electronics companies like Skyworth and TCL, but with an eye to pulling through demand for ICs.
- Chinese industry, after orgies of investment in the 2000-2004 and 2008-9 periods, still finds itself backward in ERPs, automation, software systems, billing systems, and even bar coding.
- In many cases, the supportive policies are directly responsible for killing off competitiveness in the favored companies.
 - 1998 domestic cell phone promotion policy: all the beneficiaries are now out of the cell phone business (Panda, TCL Handsets, Konka, Kejian, etc.)
 - IC design program of 2002
- Semis generally: for 40 years, the government promoted domestic monocrystalline and IC production, but nothing happened until the ITA in 2000—and then the biggest policy favorites, like Leshan and Luoyang, despite massive funding, never made anything worth selling.

The problem of fraud

1. *Cheap money*
2. *High growth expectations*
3. *Weak corporate governance*
4. *No market enforcement*

The perfect storm



What's next?

- *More, bigger frauds, like Longtop*
- *Scrutiny to Hang Ser*
- *Lower prices for sound companies like Tencent and Sina, but where to buy in?*
- *Emerging interest in shorting Chinese deb*