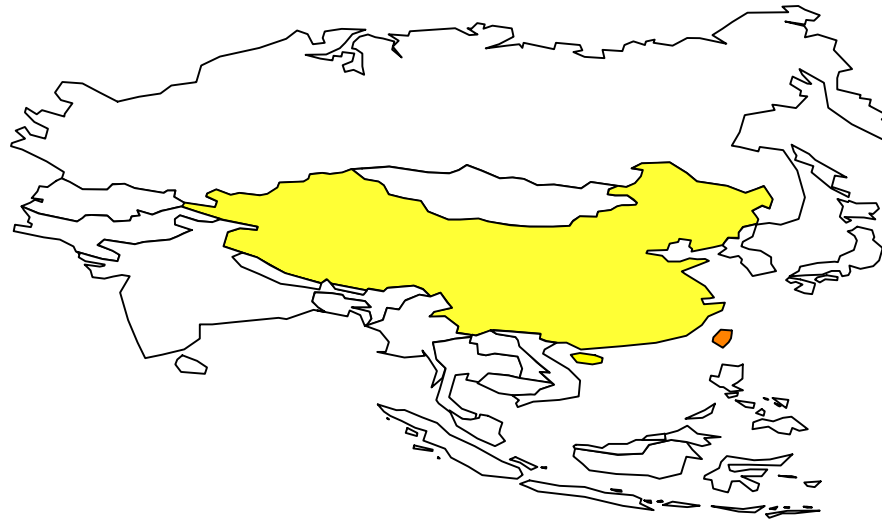
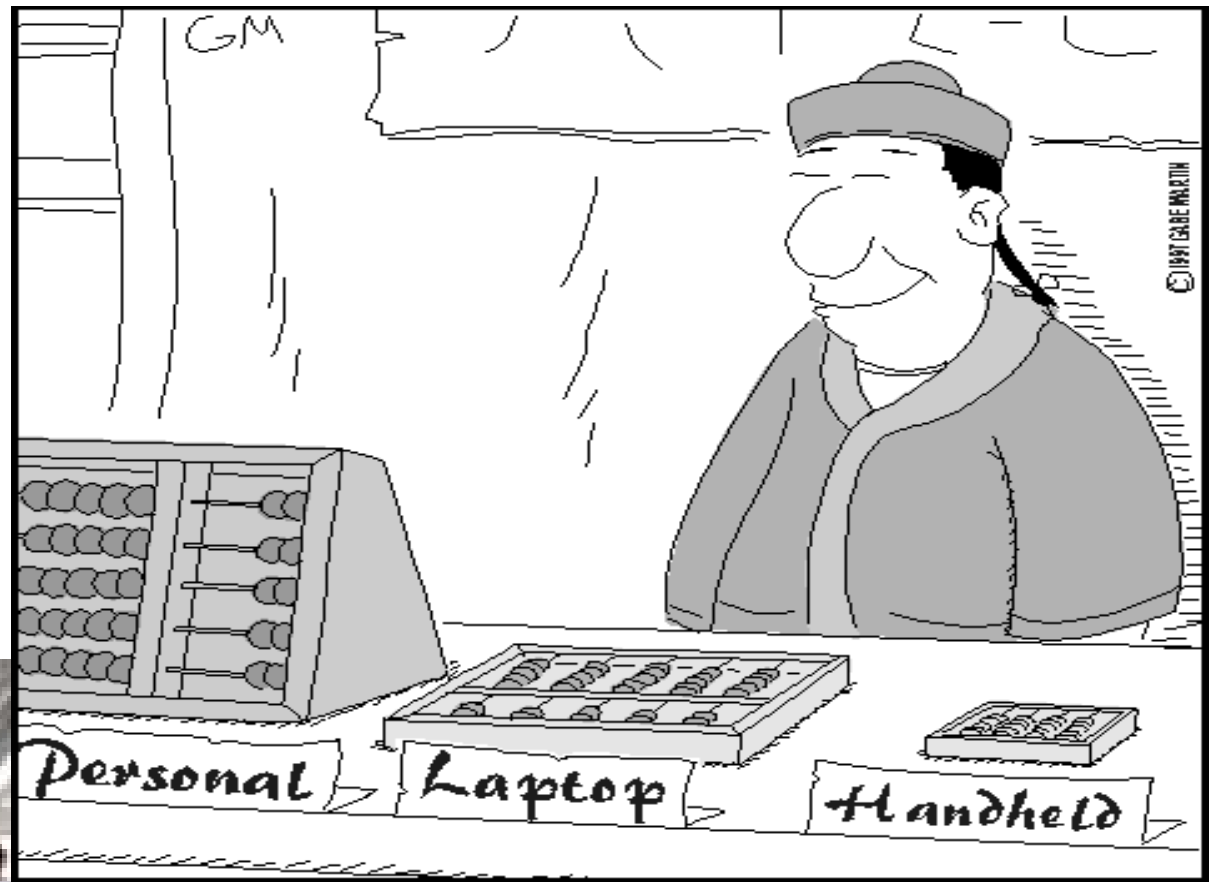


# The Nature of Chinese Exports of Advanced Technology Products (ATP) to the United States

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\*The views expressed in this presentation are solely those of the presenter. They are not meant to represent in anyway the views of the U.S. International Trade Commission or any of its individual Commissioners.



**Ancient Computer Expos**

- What people think China should export

# What China is increasingly exporting



# Summary

- Motivation
  - U.S. measurement originated in the industrial policy debate of the 1980s, amid concerns about declining competitiveness, but is essentially statistical. Chinese classifications are used in part to implement actual industrial and development policies.
- Balance in ATP trade:
  - China ran a \$41-\$49 billion surplus with U.S. in 2006 based on U.S. Census ATP definition, but not in every sector
- Role of processing trade:
  - More than 95% of China's ATP exports were processing exports during 1995-2006
- Role of different types of firms:
  - More than 90% of China's ATP exports to U.S. were produced by Foreign Invested Enterprises (FIE) in China
- Role of government policy zones:
  - About 65% of China's ATP exports to U.S. were from government policy zones in 2006
- Relative price and within-product specialization:
  - A huge quality gap still exist between Chinese ATP exports to U.S. and U.S. ATP exports to China, as measured by unit values

# U.S. definitions of ATP trade

- Background in 1980s industrial policy debate and fears of lost competitiveness
  - Transition to aggregate merchandise trade deficits in 1971-75
- Original definition (Comerco/ITA) based on 10 industries with high direct & indirect R&D/sales ratio, all products in each industry (Davis 1982, Abbott et al. 1989)
  - \$24 billion surplus in 1982, \$2.6 billion deficit in 1986
- Revised definition (U.S. Census) starts from the development of broad technology fields commonly considered as advanced technology. Only products significantly associated with one or more of these leading edge technologies can be deemed as ATP (Abbott et al. 1991).
  - E.g. “Office and Computing Machines” included scales, balances, and cash registers
  - \$24.5 billion surplus in 1982, \$19.4 billion surplus in 1987.
- Roughly 700 of the 20,000 HTS-10 codes in use have been identified as ATP by Census

# Classification of ATP in the United States

| <b>Technology Field</b>      | <b>Example of Products</b>  |
|------------------------------|---|
| Biotechnology                | Vaccines for human medicine, vaccines for veterinary medicine                 |
| Life Sciences                | Magnetic resonance imaging apparatus, electrocardiographs, artificial joints  |
| Opto-Electronics             | Rangefinders, stereoscopic microscopes, lasers other than laser diodes        |
| Information & Communications | Personal computers, facsimile machines, communications satellites, camcorders |
| Electronics                  | Particle accelerators, semiconductors, smart cards                            |
| Flexible Manufacturing       | Industrial robots, thermostats, semiconductor manufacturing equipment         |
| Advanced Materials           | Optical fiber cables  |
| Aerospace                    | Turbojet aircraft engines, new multi-engine airplanes                         |
| Weapons                      | Guided missiles, self-propelled artillery weapons                             |
| Nuclear Technology           | Nuclear reactors, uranium compounds enriched in U235                          |

# Current Definition of High-tech Trade in China

| Name   | Version | Characteristics             | Intended Purpose   |
|--|---------|-----------------------------|--|
| China's High and New Technology Export Products Catalogue                      | 2000    | 8 fields and 1900 products  | Policy orientation<br>-Basis for export value added tax (VAT) rebate benefits      |
|  | 2003    | 9 fields and 1835 products  |  |
|  | 2006    | 9 fields and 1601 products  |  |
| China's High and New Technology Product Import and Export Statistics Catalogue | 1999    | 9 fields and 229 HS-6 codes | Statistical orientation - used in Customs' "Monthly Statistical Report" since 2002 |

# Method of Reconciliation

- Calculate the ATP value share in both U.S. imports from and exports to China at HS-6 level based on U.S. trade statistics
- Apply these same shares to China Customs data at HS-6 level
- Major advantages:
  - Blend the information available in the Chinese data on firm ownership (SOE, FIE etc.), customs regime (normal, processing, etc), and policy incentive zones (SEZs, high-tech zones, etc) with the information in the U.S. data on the finely disaggregated definition of ATP
  - Obtain more detailed structural information on U.S.-China ATP trade.

# Why U.S. ATP Classification Was Used in Our Reconciliation Exercise

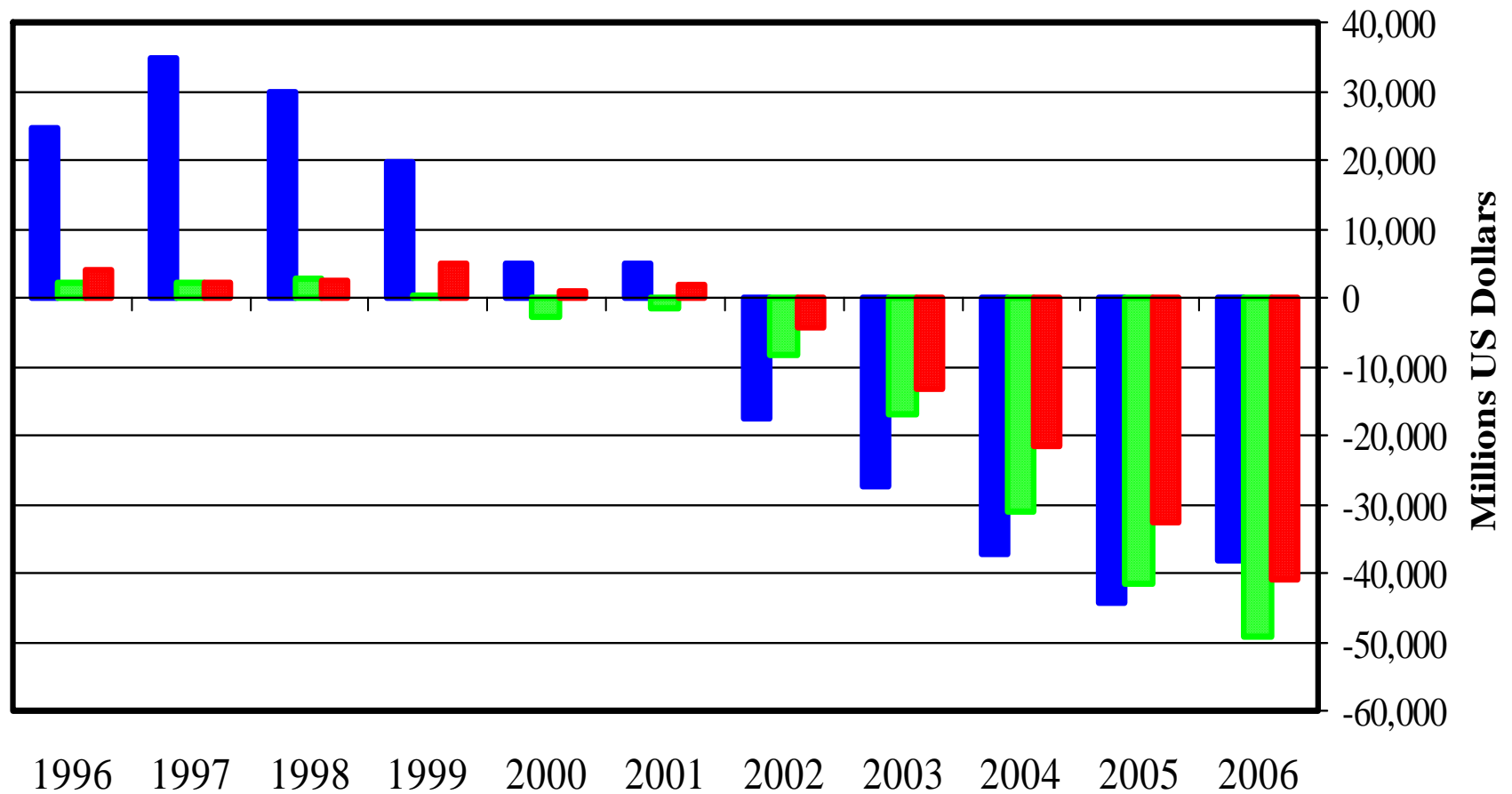
- Chinese HNTF Exports and Imports Statistical Catalogue is a near-duplication of the 2000 version of the U.S. Census ATP list at HS-6 level.
- Chinese HNTF Export Catalogue, used for VAT rebates includes many “new” products that are clearly not high-tech (such as starches, some processed food, furniture, etc.).
- China's policy-based classification resulted in a much higher ATP share in China’s exports to the United States (38.3 percent in 2005) than that based on U.S classification (24.3 percent)

# Three Types of Broad Incentives Affect China's Export Behavior

- Who you are (Domestic Firms or FIEs)
- What you do (“imports for exports” --processing exports or ordinary exports)
- Where you are located (exports produced in various government policy zones or outside these zones)

Thus, the pattern of exports deviates somewhat from pure comparative advantage

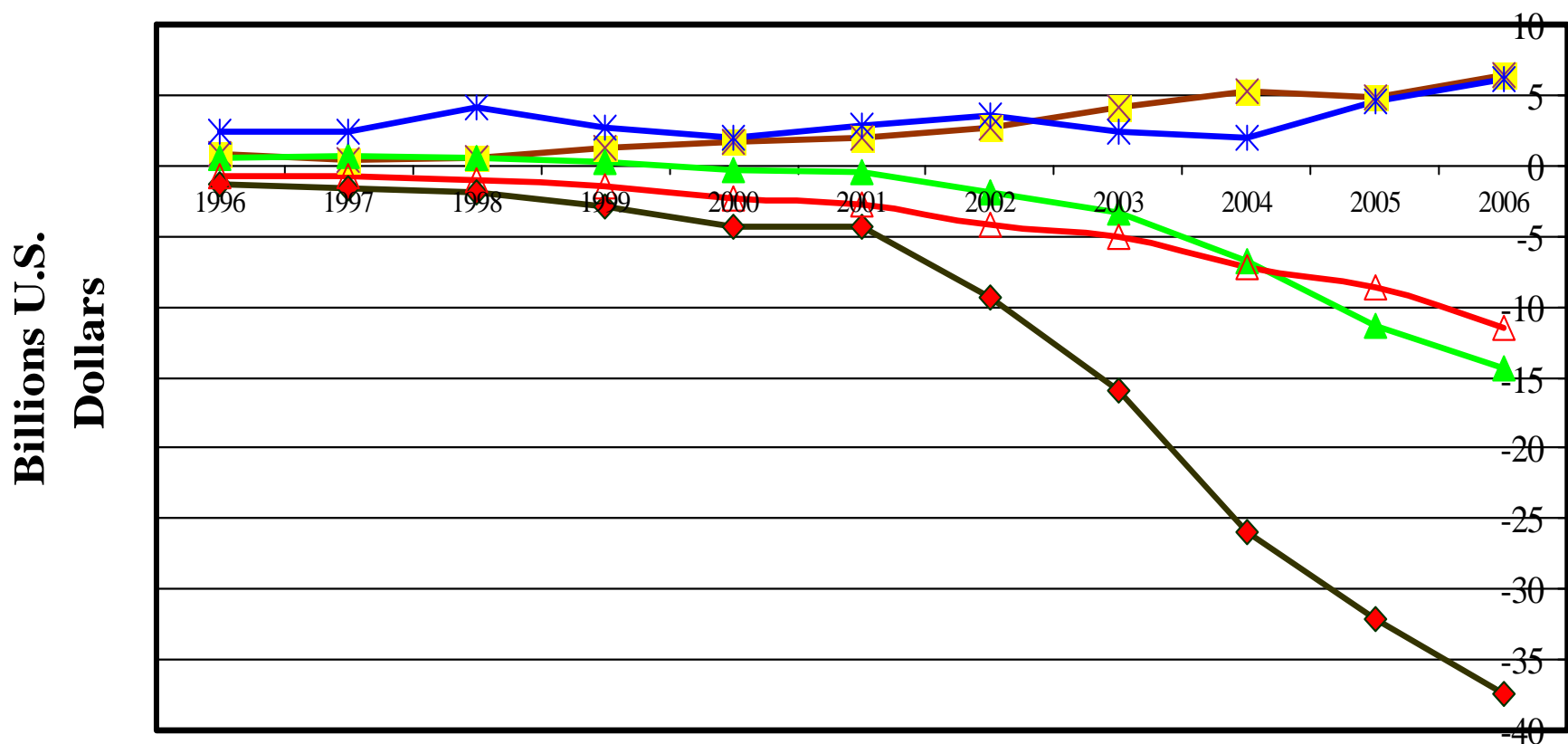
# The U.S. Deficit in ATP Trade with China Was between \$41-49 Billion in 2006



Data Source:  
U.S. Census,  
China and Hong  
Kong Customs

- US reported ATP trade balance with the World
- U.S. ATP trade balance with China and Hong Kong reported by U.S.
- U.S. ATP trade balance with China reported by China & Hong Kong

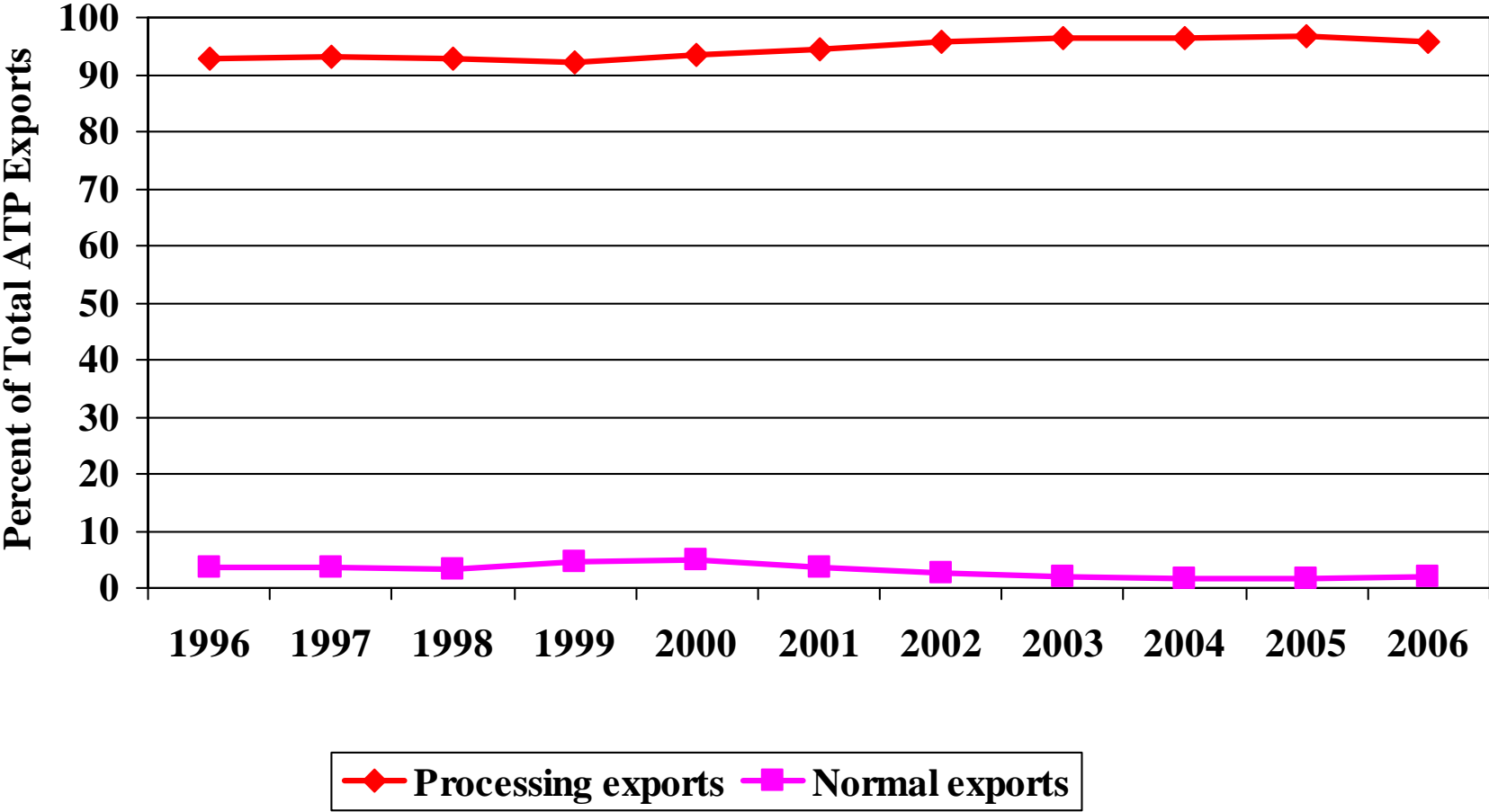
# Large Deficits in Information and Communication Technology, Bilateral Surpluses in Electronic Components and Aerospace Technology



Data Source:  
U.S. Census

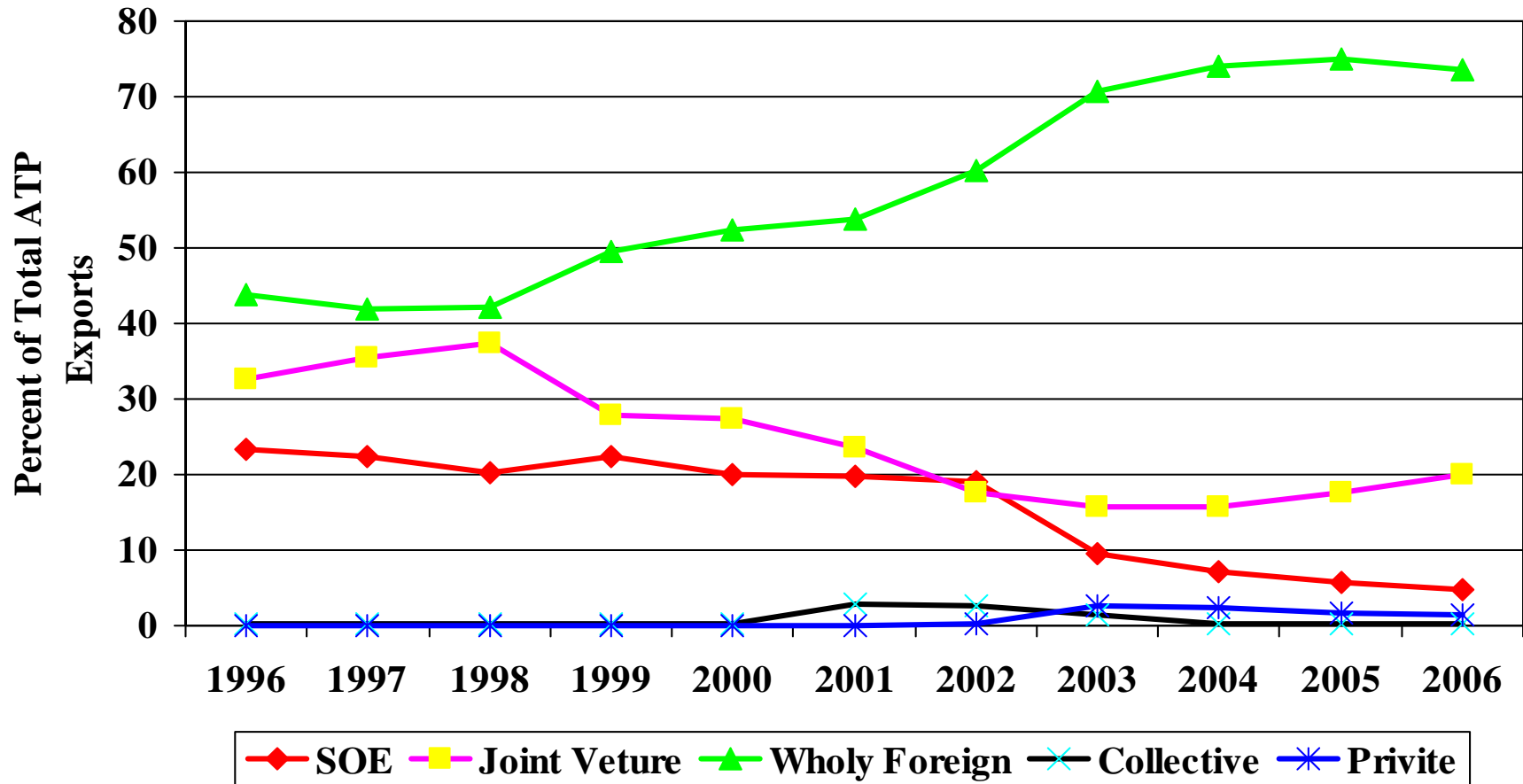
- ◆ Office, accounting and computing machinery, ISIC 3000
- Electronic valves and tubes and other electronic components, ISIC 3210
- ▲ Television and radio transmitters and apparatus for line telephony, ISIC 3220
- △ Television and radio receivers, sound or video recording or reproducing apparatus, ISIC 3230
- \* Manufacture of aircraft and spacecraft, ISIC 3530

# More than 95% of Chinese ATP Exports to U.S. were Processing Exports



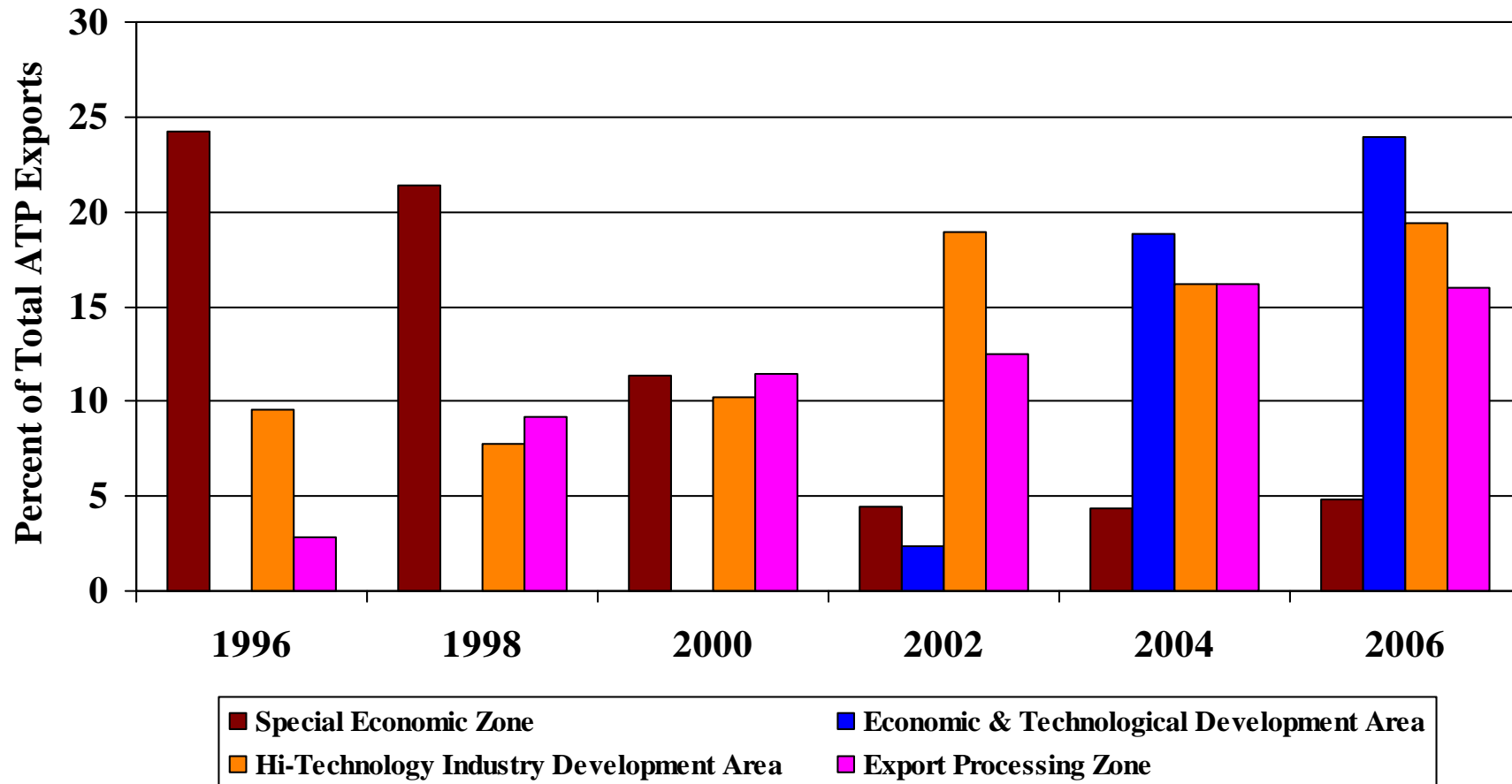
Data Source: China Custom Statistics, U.S. Census ATP definition

# Since 2003, about 90% of Chinese ATP Exports to U.S. were Produced by FIEs



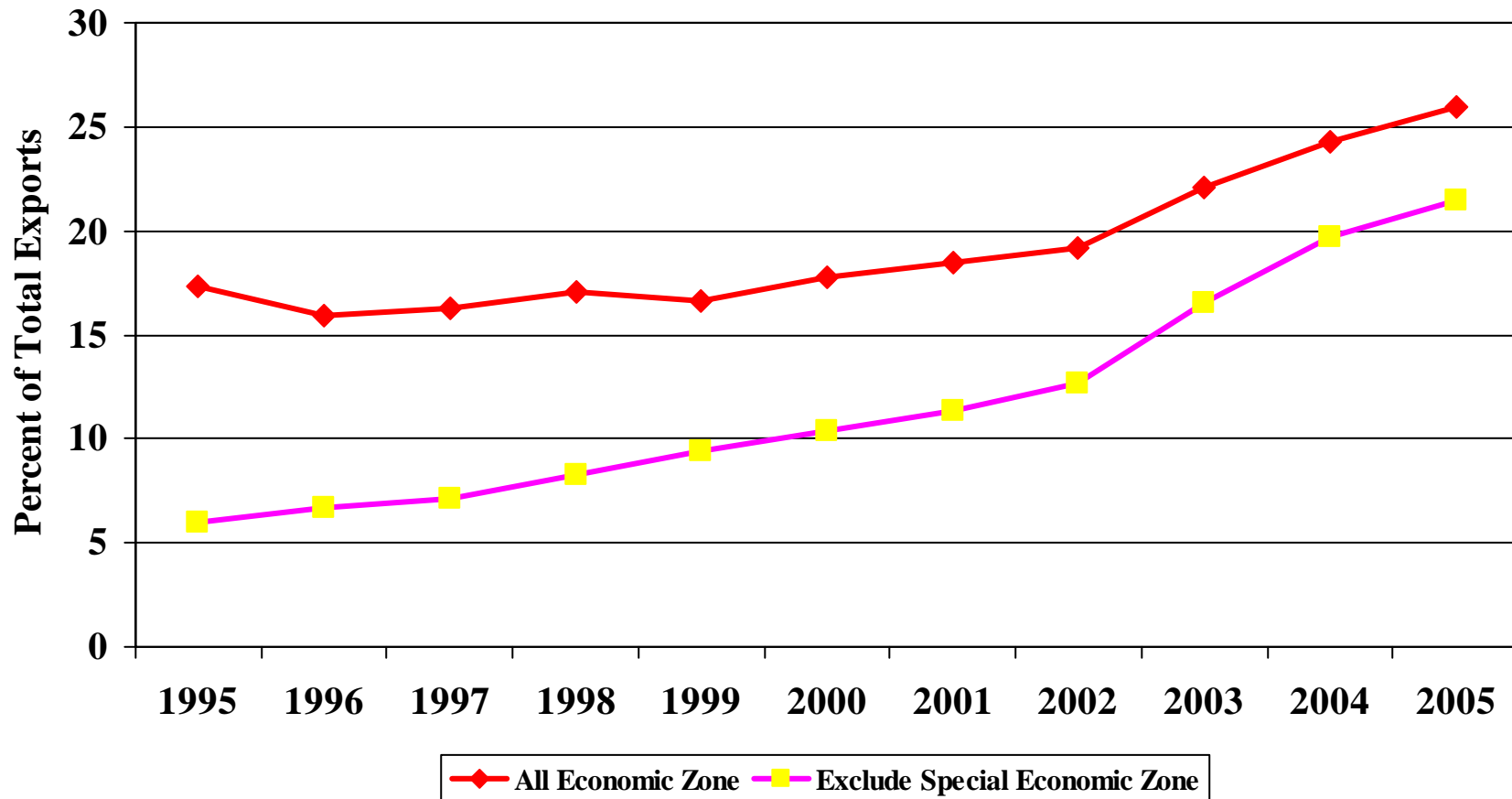
Data Source: China Custom Statistics, U.S. Census ATP definition

# About 65% of China's ATP Exports to U.S. Came from Various Government Policy Zones in 2006 (only about 25% of China's total exports to the world are from such zones)



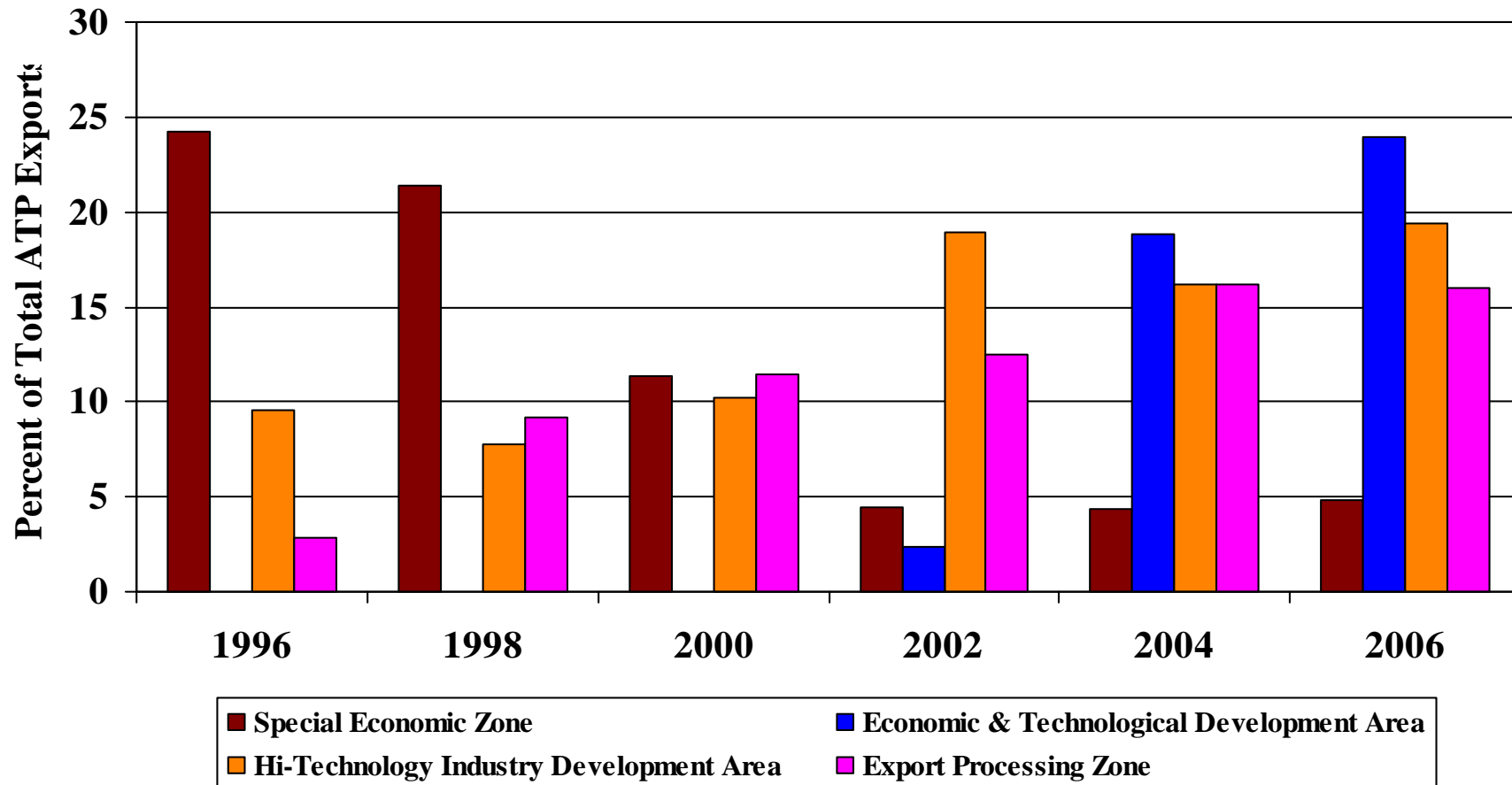
Data Source: China Custom Statistics, U.S. Census ATP definition

# Only about 25% of China's Merchandise Exports to the World were from these Government Policy Zones



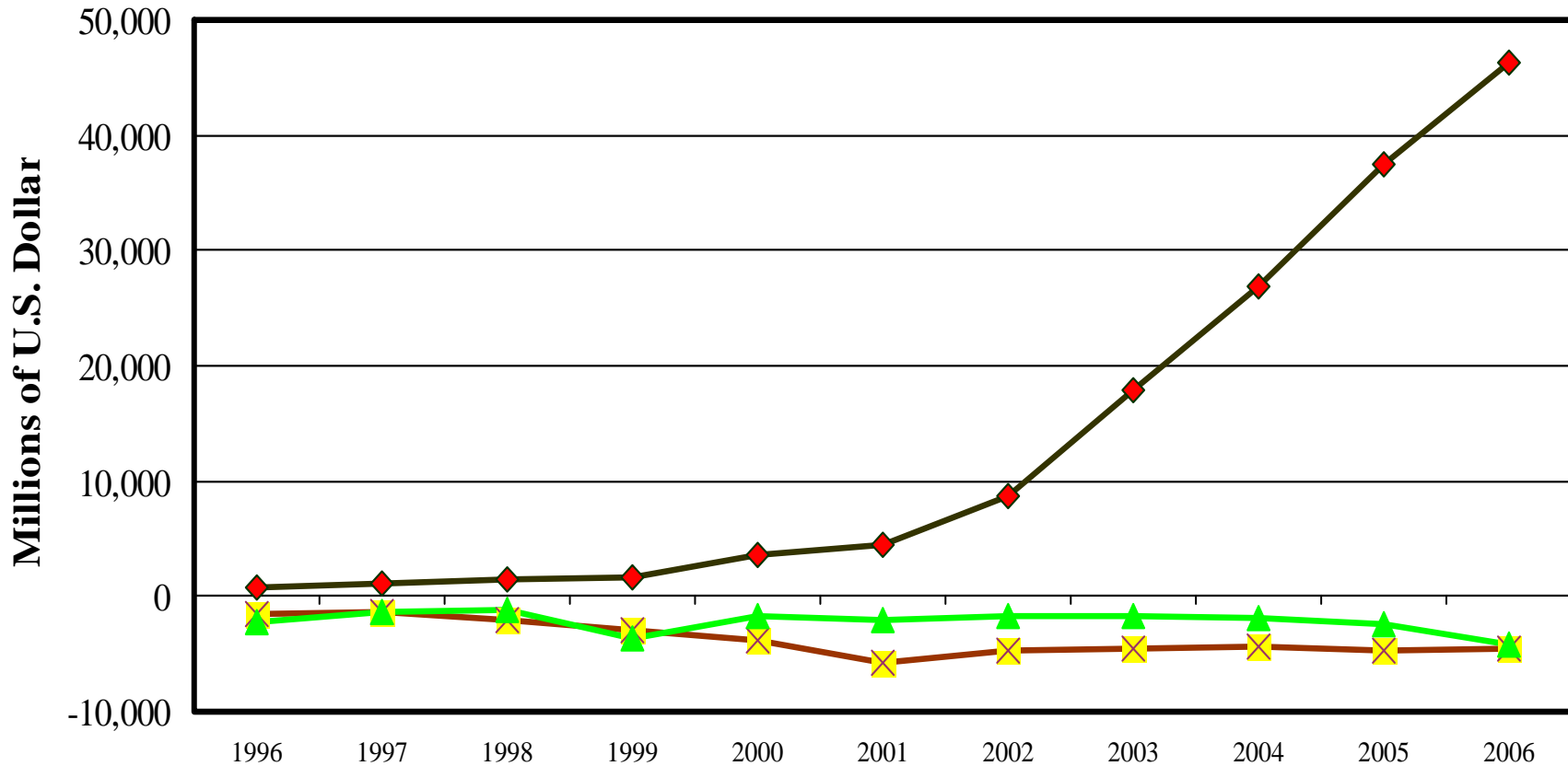
Data Source: China Custom Statistics

# About 65% of China's ATP Exports to the United States Came from Various Government Policy Zones in 2006



Data Source: China Custom Statistics, U.S. Census ATP definition

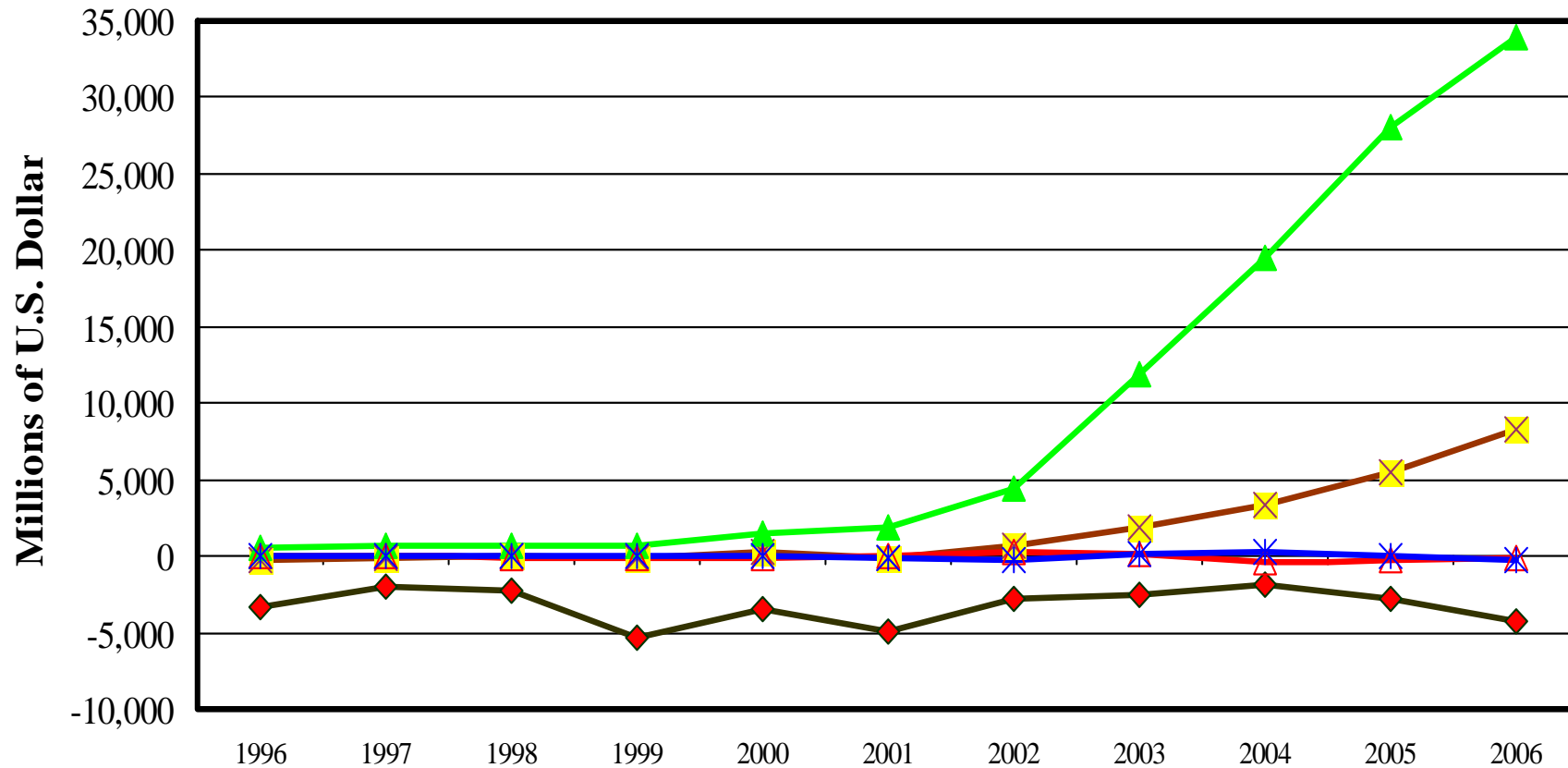
# China's ATP Trade Surplus with the U.S. was Due Solely to Processing Exports



Data Source: China Custom Statistics, U.S. Census ATP definition



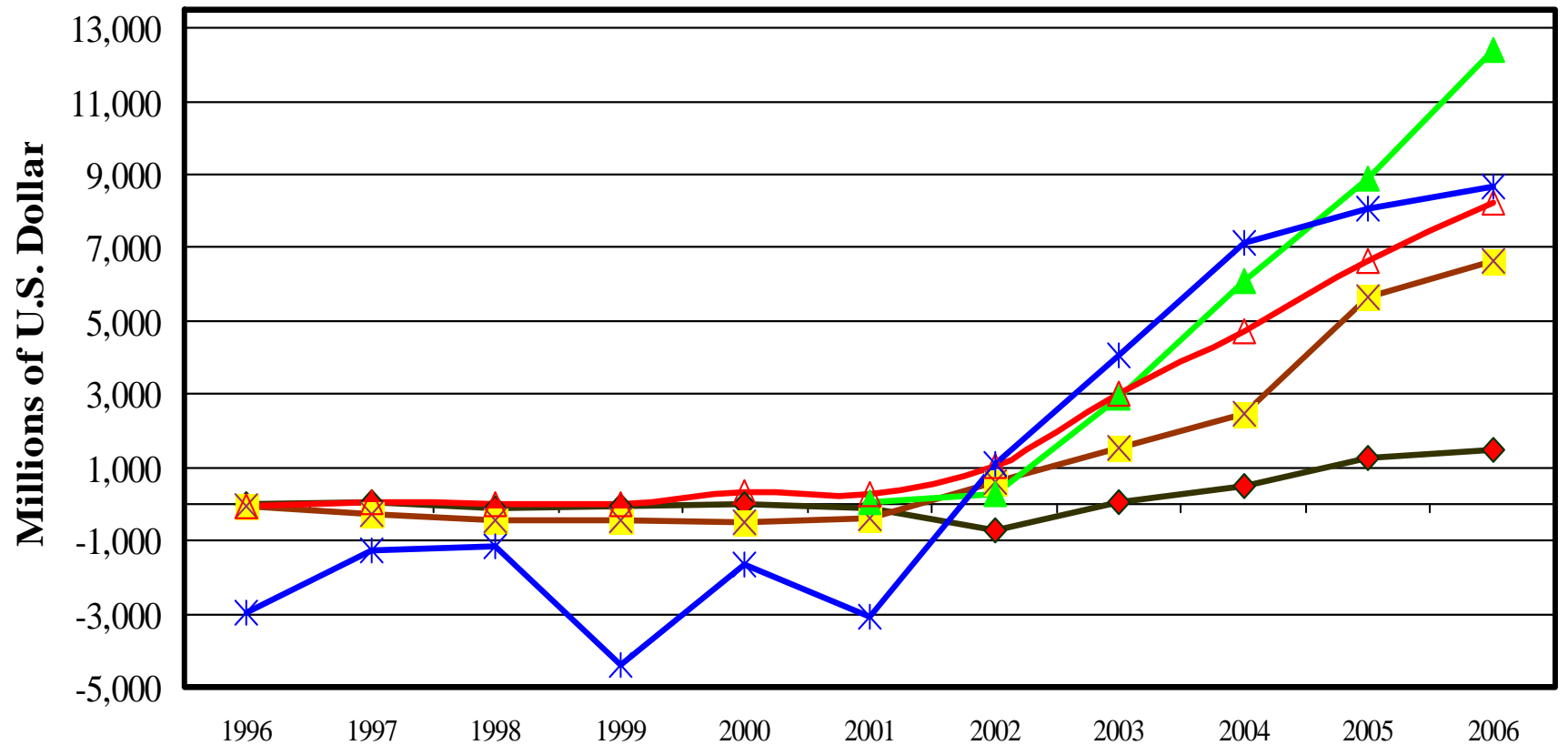
# China's ATP Trade Surplus with U.S. was mainly Generated by Foreign-Invested Enterprises Since China's WTO Accession



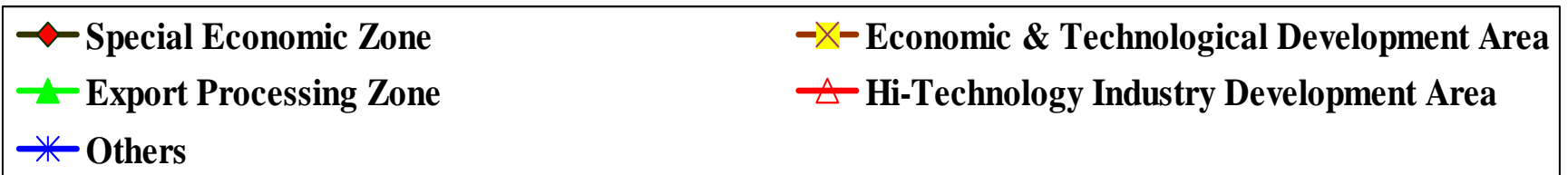
Data Source: China Custom Statistics, U.S. Census ATP definition



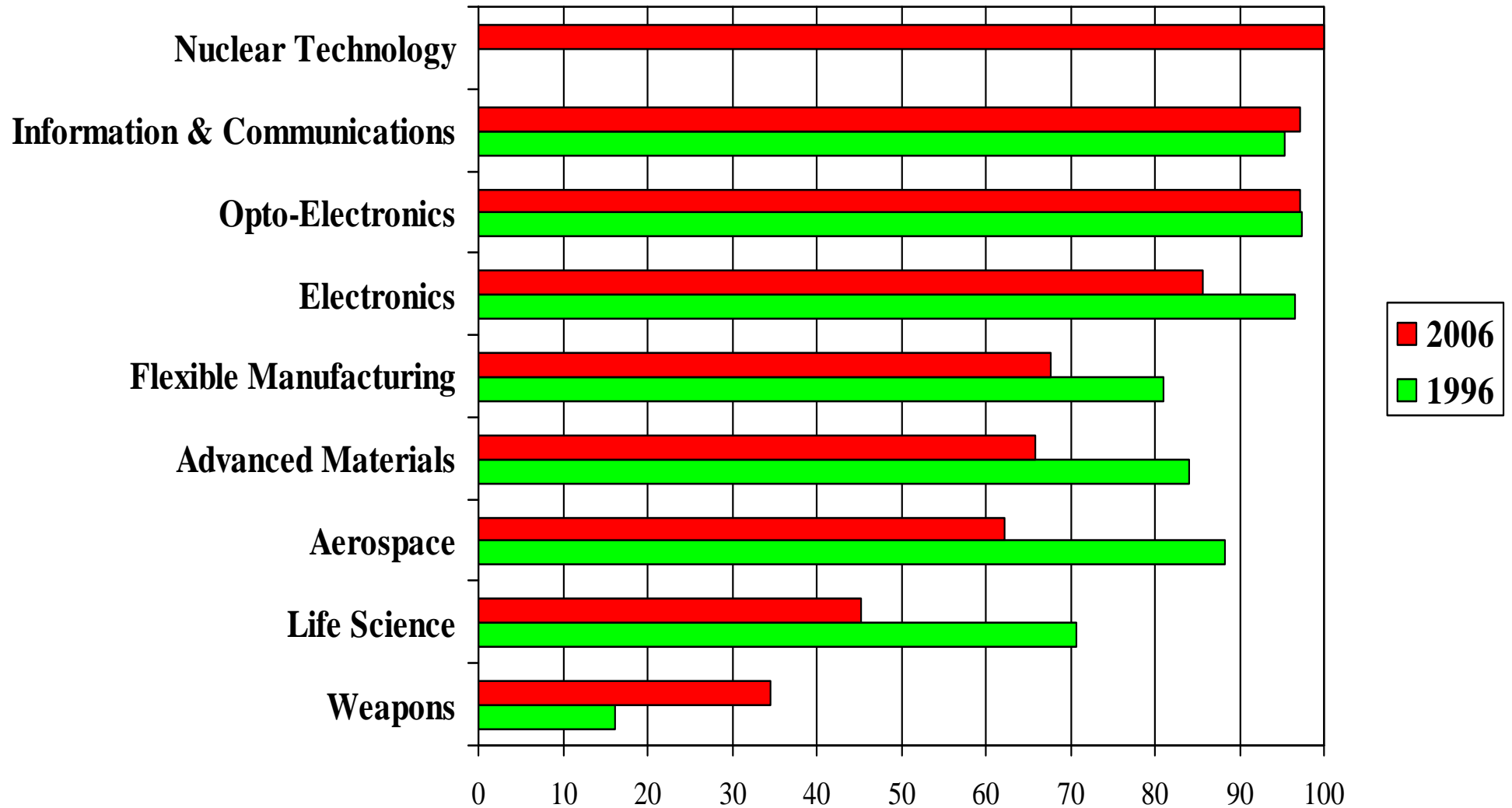
# Various Special Economic Zones Contributed Significantly to China's ATP Trade Surplus with the United States



Data Source: China Custom Statistics, U.S.Census ATP definition

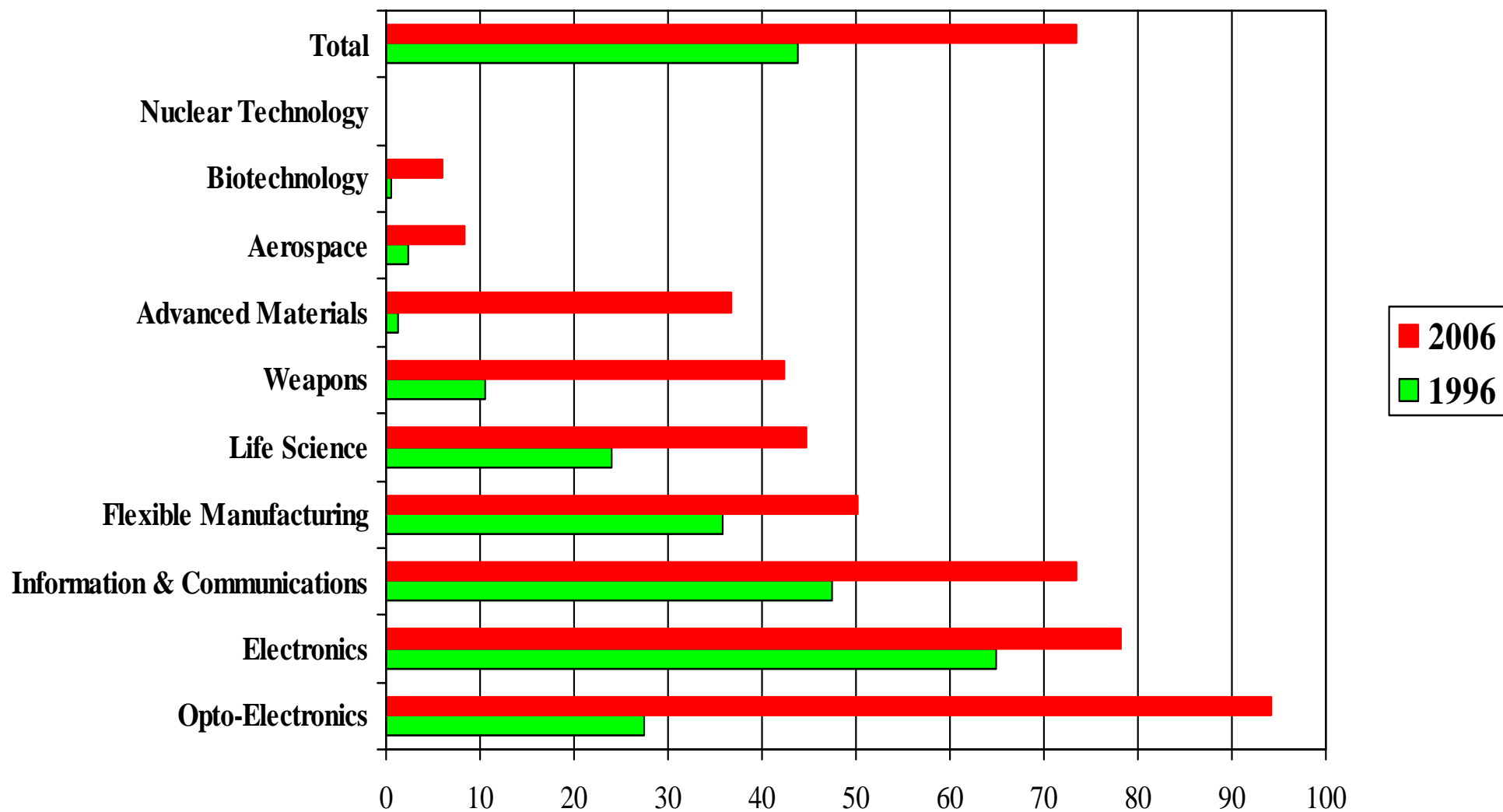


# China's Processing ATP Exports as Percent of Total ATP Exports to U.S. by Technology Fields 1996, 2006



Data Source: China Custom Statistics, U.S. Census ATP definition

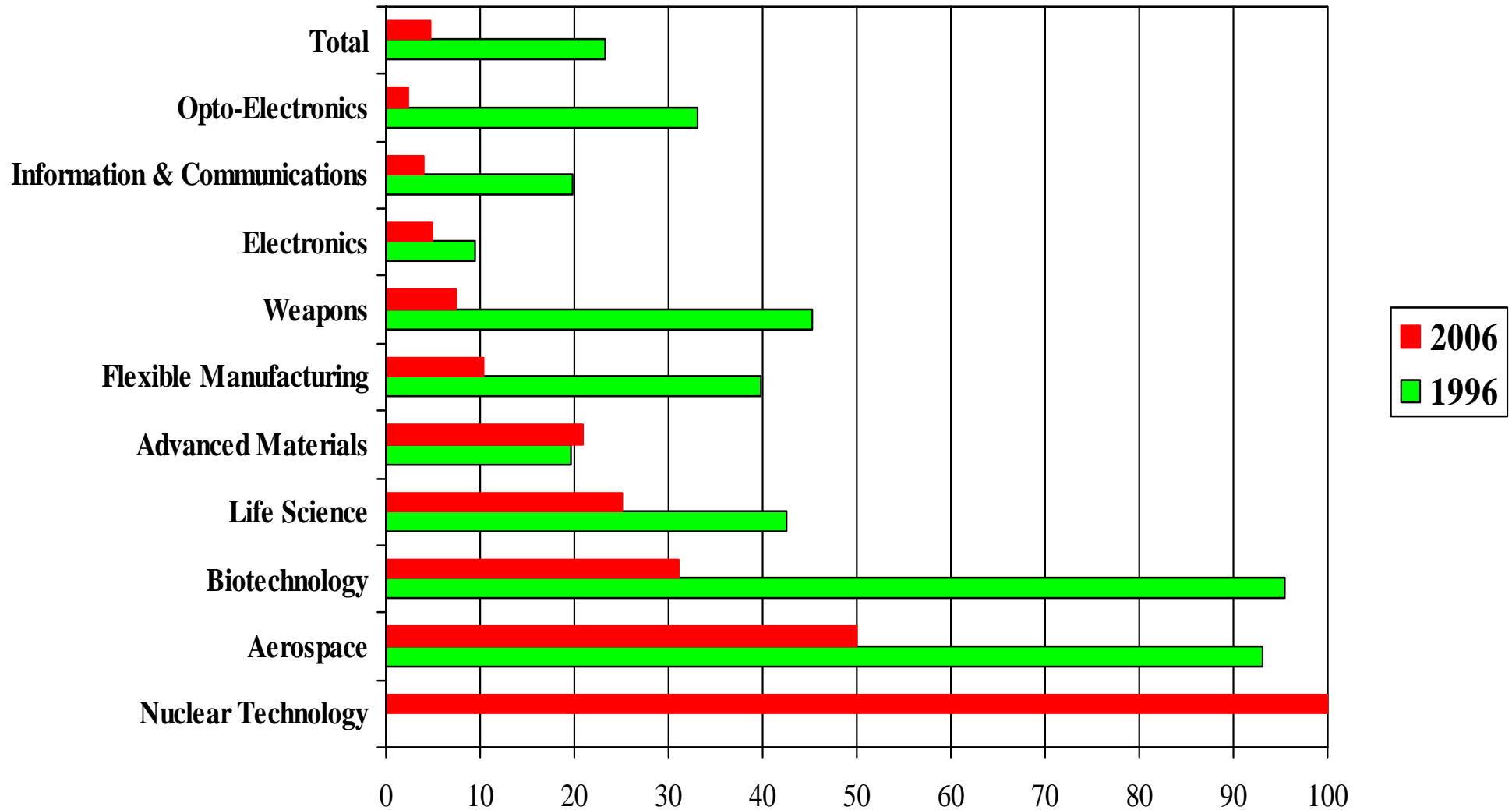
# Share of Wholly Foreign Owned Firms in China's Total ATP Exports to the U.S. by Technology Fields, 1996, 2006



Data Source: China Custom Statistics, U.S. Census ATP definition

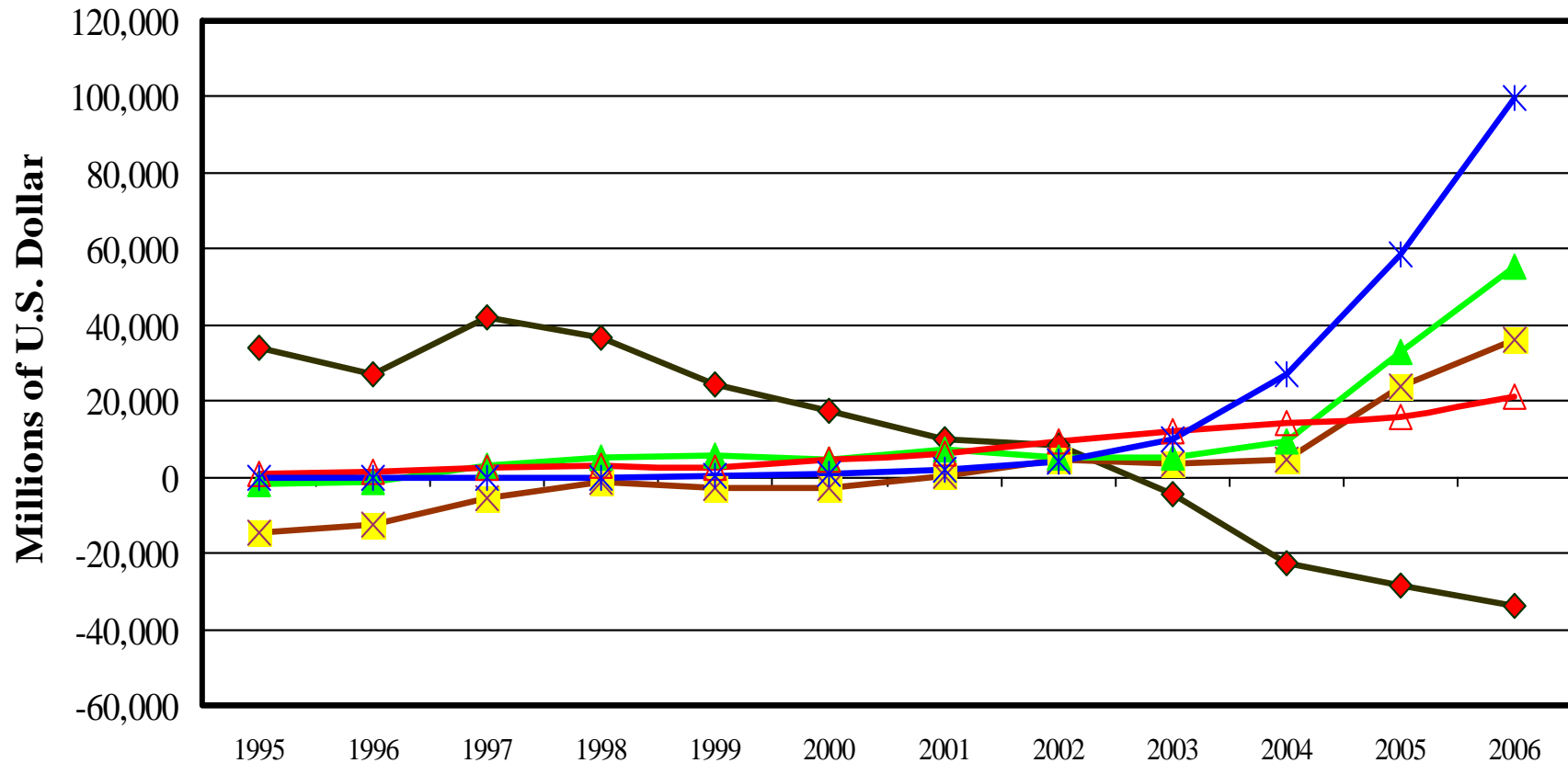
# Share of SOEs in China's Total ATP Exports to U.S. by Technology Fields

## 1996, 2006



Data Source: China Custom Statistics, U.S. Census Definition

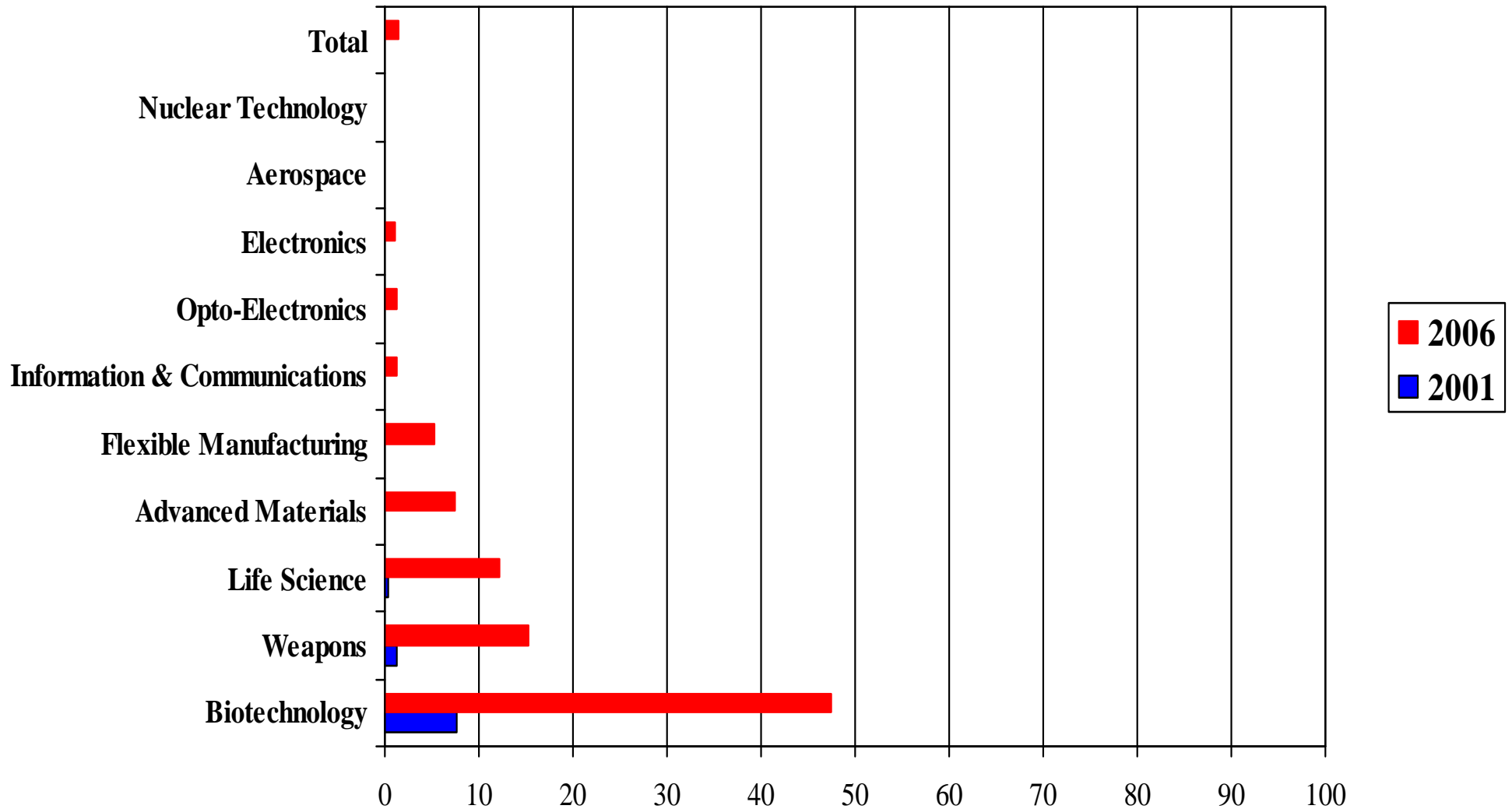
# Since China's WTO Accession, Private Firms have generated the Largest Part of the Trade Surplus for All Commodities



Data Source: China Custom Statistics, U.S. Census ATP definition



# Share of Private Firms in China's Total ATP Exports to U.S. by Technology Fields 2001, 2006



Data Source: China Custom Statistics, U.S. Census definition

# Prices and Quality in U.S.-China ATP Trade

- There has been a recent focus on the fact that unit values for similarly-described products vary widely across countries, suggesting differences in quality associated with levels of development. (Schott
- 2008 focusing on China, Fontagné, Gaulier and Zignago 2008, Ferrantino, Feinberg and Deason 2008 generalizing the result to many products and countries).
- By product classification (e.g. HS-6), it appears that China's export structure is more similar to Japan, U.S., and EU than to Brazil and Russia
- Chinese exports are likely to sell at lower unit values than U.S. products, suggesting quality differences.

## Example: Microscopes

### U.S. exports to China and China exports to U.S. HS 9011, 2006

| HTS number                   | HTS Product  | Total exports<br>U.S. Dollars | Unit value<br>U.S. Dollars |
|------------------------------|--|-------------------------------|----------------------------|
| <b>U.S. exports to China</b> |  |                               |                            |
| 9011100000                   | Stereoscopic microscopes                               | 487,179                       | 3,431                      |
| 9011200000                   | Microscopes, for<br>microphotography & cinema          | 693,491                       | 11,754                     |
| <b>China exports to U.S.</b> |  |                               |                            |
| 9011104000                   | Stereoscopic microscopes with<br>means to photo image  | 1,592,944                     | 251                        |
| 9011108000                   | Stereoscopic microscopes                               | 3,647,098                     | 115                        |
| 9011204000                   | Microscopes with means to<br>photograph the image      | 1,459,958                     | 215                        |
| 9011208000                   | Microscopes, exc with means to<br>photograph the image | 1,864,786                     | 61                         |

# Products with very high income-related quality-ladder effects

- These correspond to “U.S.-China” price ratios of 7:1 to 22:1
- Metal-working machines
- Specialty weighing devices
- Cathode ray tubes and television camera tubes
- Cameras (underwater and instant print)
- Some agricultural and food processing machinery
- Optical astronomical instruments and other optical instruments (e.g. exposure meters)
- Some elements and compounds (arsenic, furfuraldehyde, carbon disulphide, scandium and yttrium and alloys)
- Glass tubes of fused quartz or silica
- Certain watches (HS 910191)

# Conclusions 1

Trade statistics from different sources consistently show that the U.S. trade deficit in ATP with China has grown rapidly in recent years based on the current U.S. Census ATP classification

Chinese surplus of ATP trade with U.S. is concentrated in information and communication technology, while U.S. still enjoys sizeable bilateral surpluses in electronics and aerospace technology

More than 95 percent of the rapidly expanding ATP exports from China to U.S. is processing trade, which is closely related to FDI and largely carried out by foreign firms

# Conclusions 2

Various special economic zones and areas have largely hosted the rapid expansion of Chinese ATP exports to the U.S.

The emergence of China as a major supplier to the U.S. ATP market is closely associated with a combination of three major factors:

- Fragmentation of global production
- China's comparative advantage in manufacture
- Chinese Government preference policies to processing trade and foreign invested enterprises

# Conclusions 3

An analysis of unit value adds important insights.

Chinese ATP imports from U.S. were dominated by large-scale, sophisticated, high-valued equipment and devices, while Chinese ATP exports to the United States were still mainly small-scale products or components in the low-end of the ATP value-added chain.

Even though China has begun to export a set of ATP products similar to those exported by the U.S. in recent years, there appears to remain a considerable quality and technological gap between Chinese ATP exports and U.S. ATP exports.

Thanks! Questions?