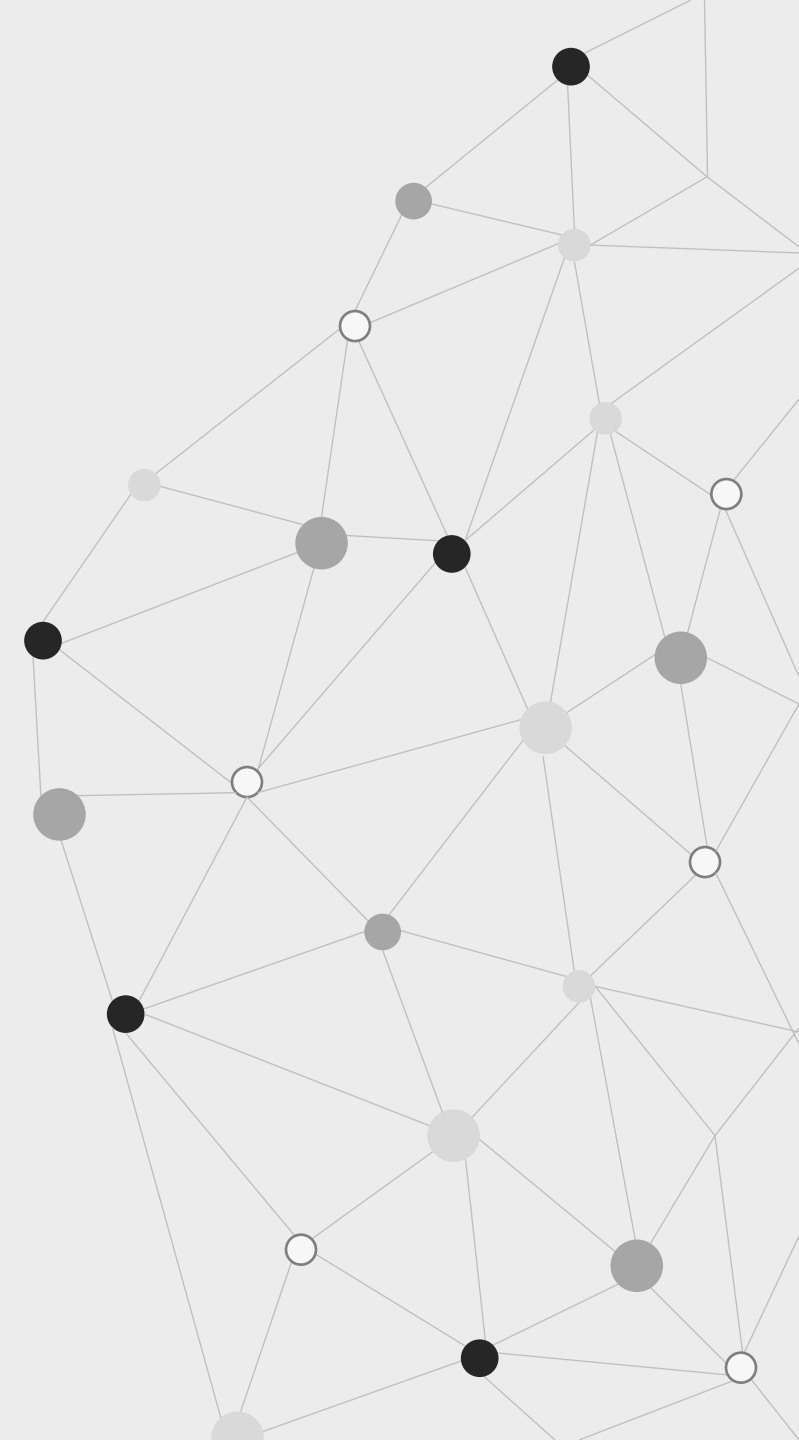
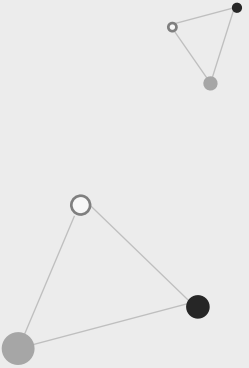


**Exponential technology change and  
Automation :Opportunity and  
Chanllege for  
Developing countries**

Mexico city,December 6-8,2016

**ZHANG Chenggang**

**Tsinghua University**



# For Session 8:

- Session 6: IMPLICATION FOR REDUCING INEQUALITY
- What are your views on potential effects of automation technologies on various segments of population in developed and developing countries? What does this mean in terms of inequality within and across countries?

# **Aotomation Technology and social transformation**

- **Technology and social transformation**
- **How to promote the transformation of the Chinese society towards modernization**

# **I. The Chinese society has experienced significant social transformation**

- **1. Market transformation**
- **A substantial change has occurred in the operating model of the economy**
- **Planned economy to a market-economy**

# **2. Urbanization in China**

- **Urban population**
- **1978: 17.92%**
- **2016: 56.10%**
- **Totaled 770 million in urban**
- **urban permanent resident & urban migrants**

# Largest industrialization & urbanization ever in human history



# **3.Industrialization and the changing industrial structure**

- **2015: the nation's GDP**
- **The primary industry: 9.0%**
- **The secondary industry accounted for 40.5%**
- **The tertiary industry: 50.5%**

# II. Changes of the Structure of Social Stratification

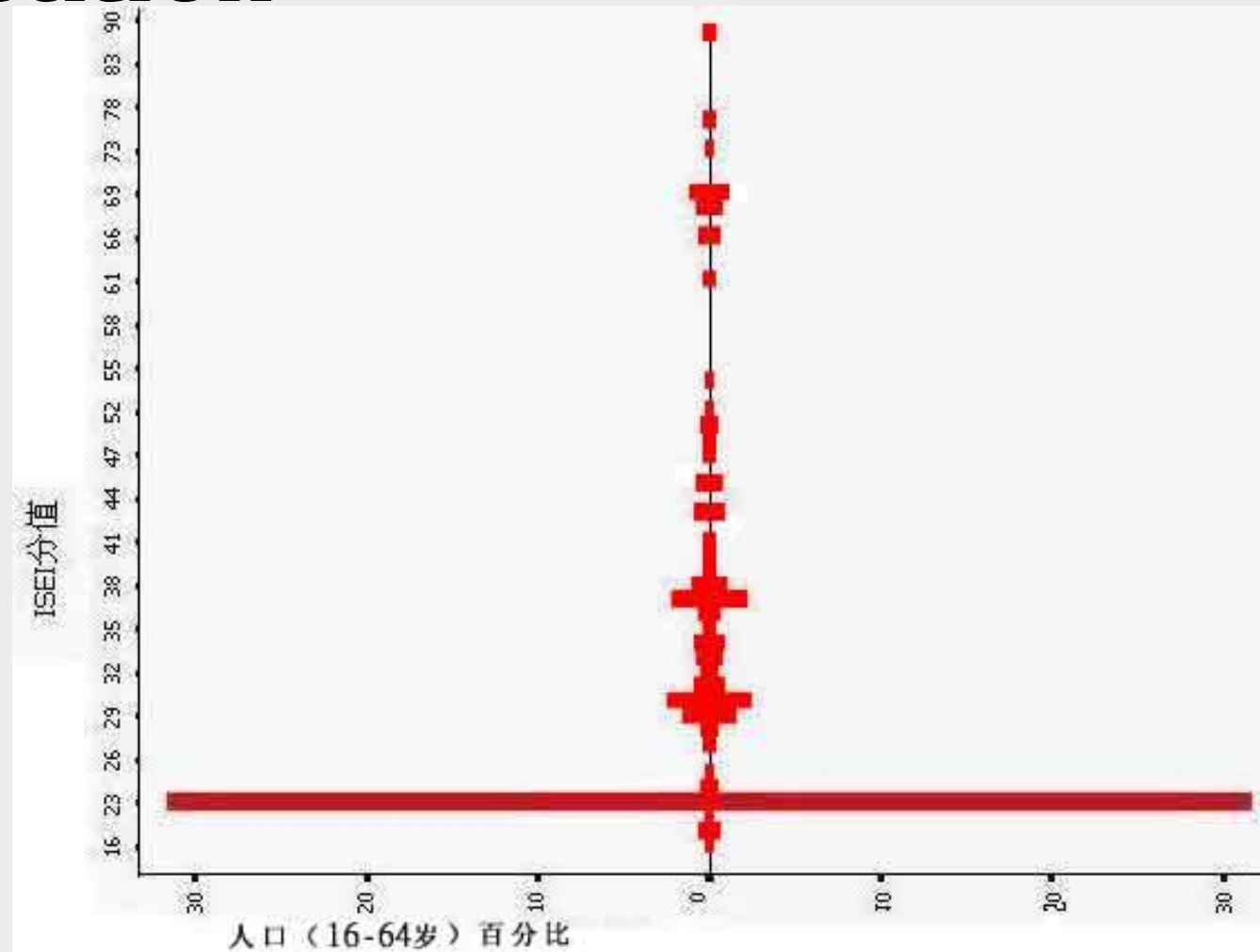
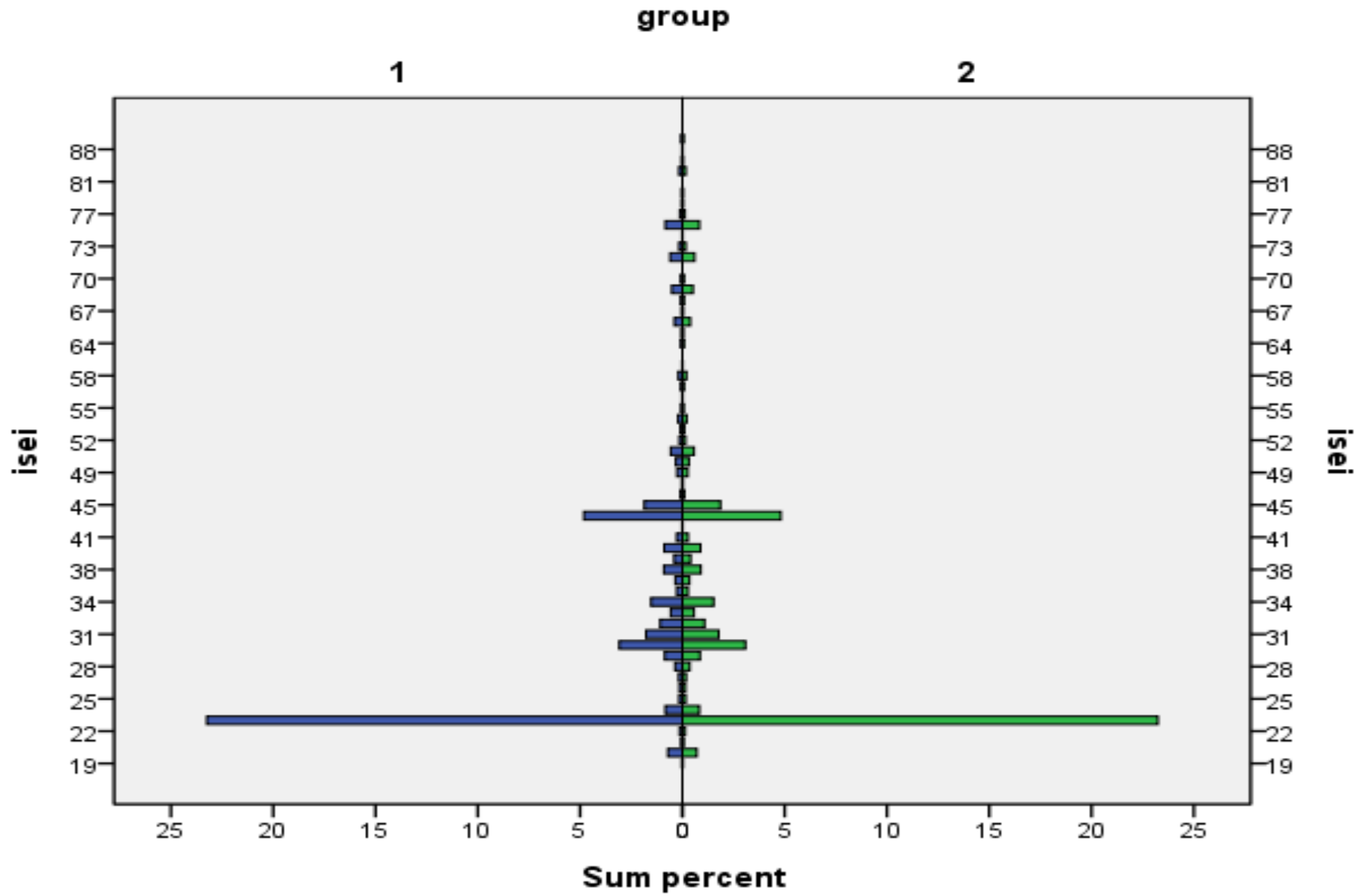


图1. 按照ISEI值测算的我国社会经济地位结构图形

**Social structure in china ISEI (2000)**



# Social structure in china ISEI (2000)



# **Changes taking place in China's four major groups**

- **1. Farmers**
- **23 points group predominated by farmers:**
  - **63.20% in 2000**
  - **46.49% in 2010**
  - **down by 16.71%.**

- **2. Typical manual workers:**
- **most of them are migrant workers.**
- **29-32 points group:**
- **9.8% in 2000**
- **13.58% in the 2010**
- **Rising by 3.78%.**
- **Production & related workers**

- **3. Technician group**
- **The percentage of operating technicians has fallen among all workers.**
- **33-40 points group:**
- **11.2% in 2000**
- **9.8% in 2010**
- **Down by 1.4%.**

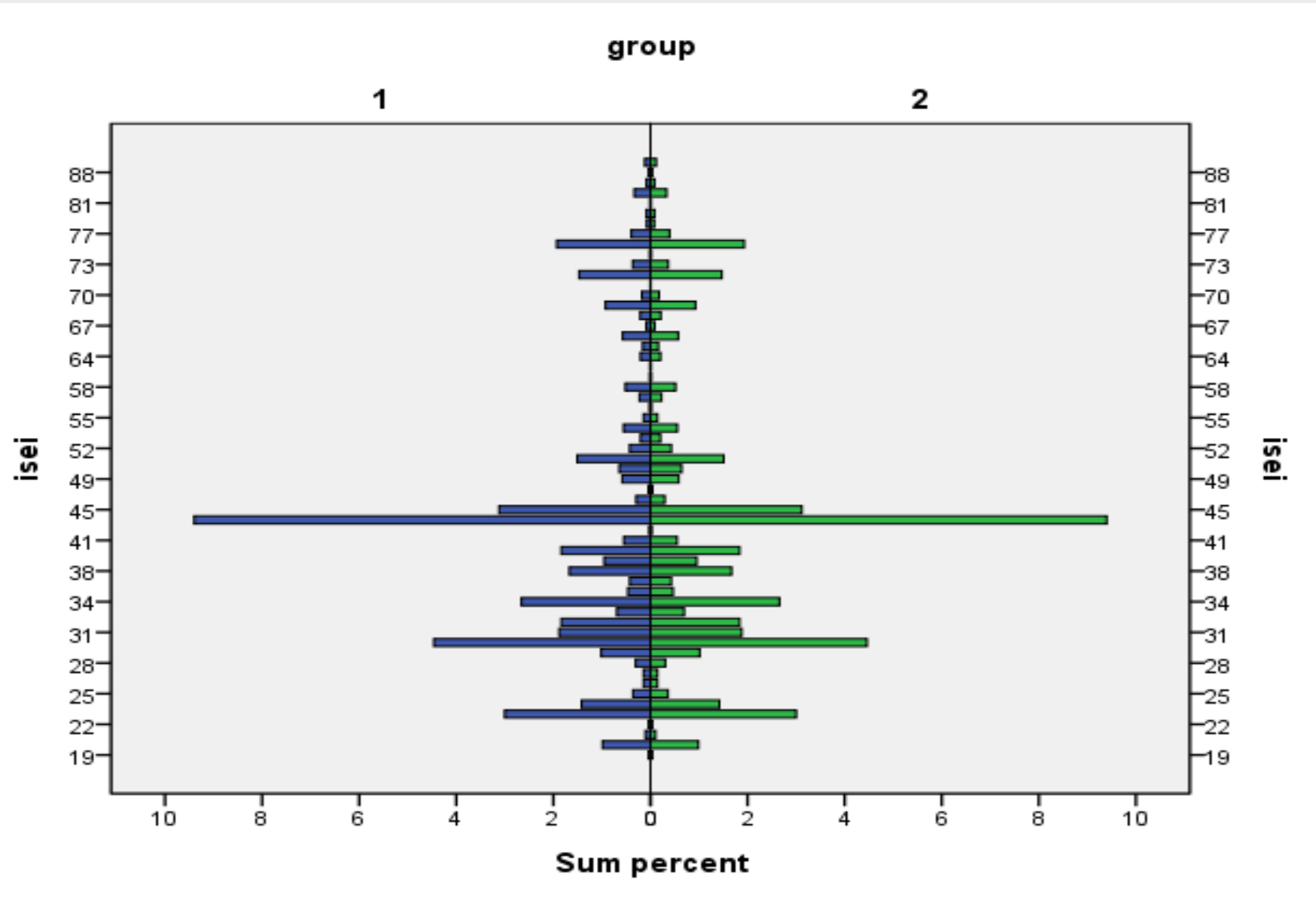
- The percentage of technicians saw a decline instead of an increase.
- The significance of technicians
- The institutional reason for the slight decline.
- Technicians: the transition stratum to middle class

- **4. White-collar groups including business and sales personnel**
- **The significance of the percentage increase.**
- **Only 2.9% in 2000**
- **Jumped to 13.34% in 2010**
- **Increasing by 10.44%.**
- **This group has experienced the most significant rise, with the biggest increase of non-manual workers.**

### **III. What problems have been found in the study of China's social structure?**

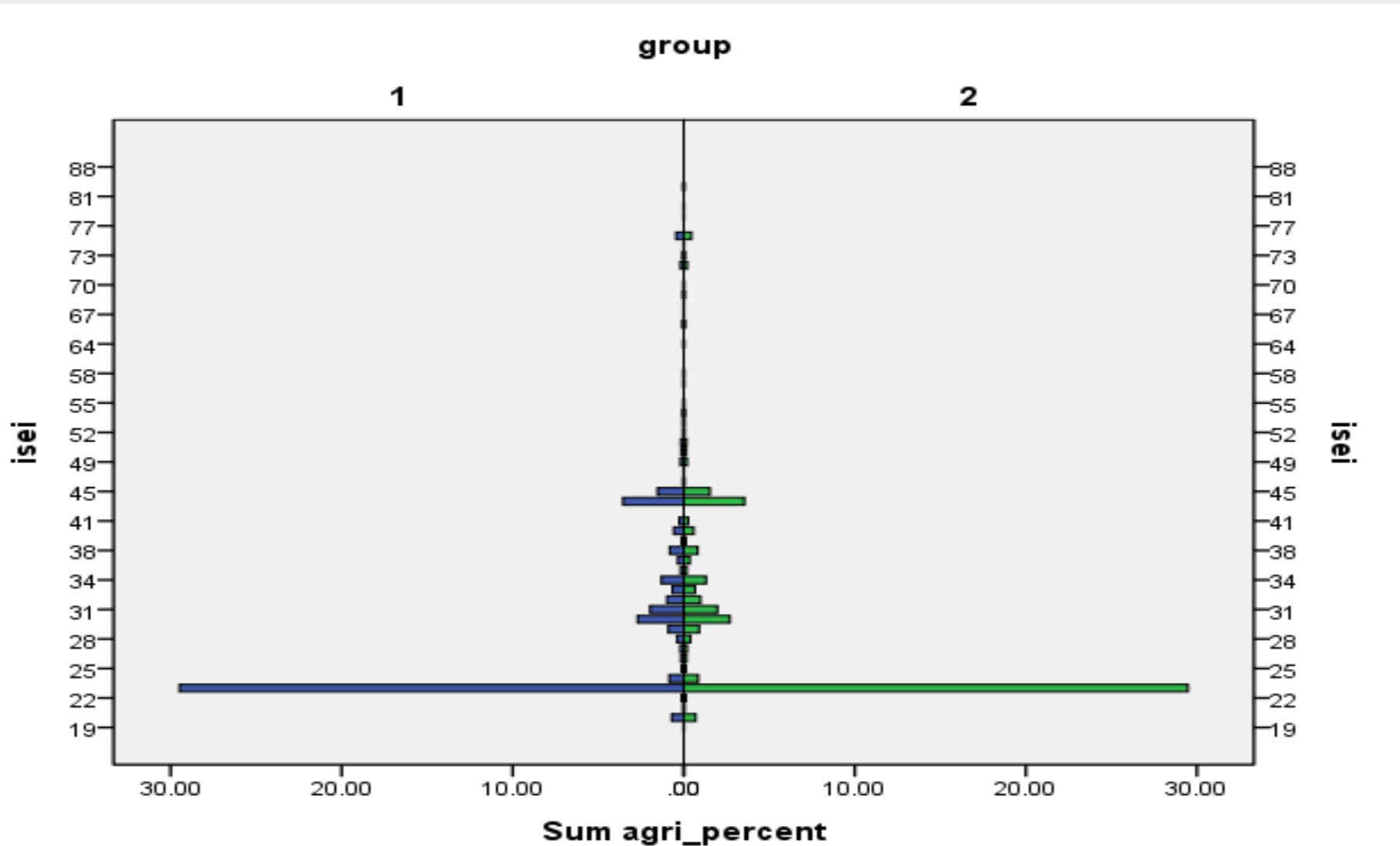
- Both the reverse T-shaped social structure and the "±"-shaped structure
- Showed smaller middle class
- Enormous gaps between rural and urban areas
- between different regions
- between the west and east; and between large cities and small ones

# Urban Social Structure(2010)





# Rural Social Structure(2010)



# **Huge gap between rural areas and urban areas**

- **The two entirely different worlds; the exodus of rural elite.**
- **A considerable part of talented, educated, and skilled agricultural population has left farmland for urban areas**
- **The growing rural-urban gap and lagging social structure in rural areas**

# **Huge gaps between large cities, and small cities**

- **The middle class is predominantly concentrated in large cities and mega-cities**
- **The polarization effect of mega-cities represented by Beijing, Shanghai, Guangzhou, and Shenzhen.**
- **Over the past decade, the middle class kept concentrating towards large cities and the eastern part of China.**

# **Middle class tends to concentrate towards large cities in the east.**

- **CGSS data: from 2005 to 2013**
- **Middle class in the east by income: 53.3% → 66.65%**
- **Middle class in the east by education: 39.21% → 55.91%**
- **Middle class in the east by occupation: 40.92% → 56.17%**

# **The percentage of middle class in the west falls**

- **CGSS data: from 2005 to 2013**
- **Middle class in the west by income:  
21.23%→14.37%**
- **Middle class in the west by education:  
25.30%→16.14%**
- **Middle class in the west by occupation:  
25.09%→17.22%**

# **IV. Social Transformation**

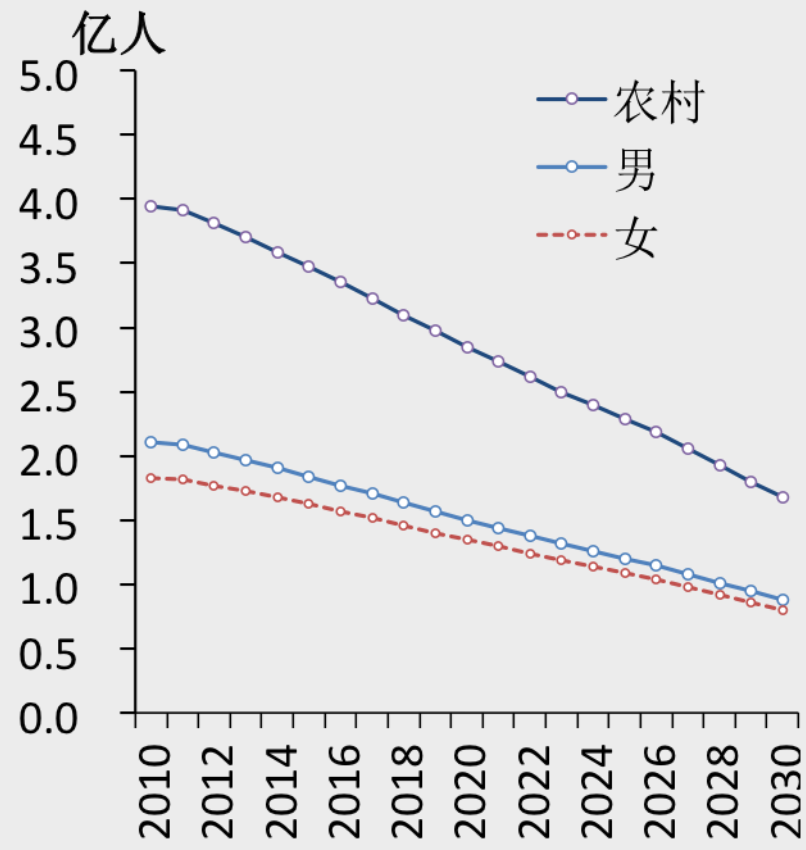
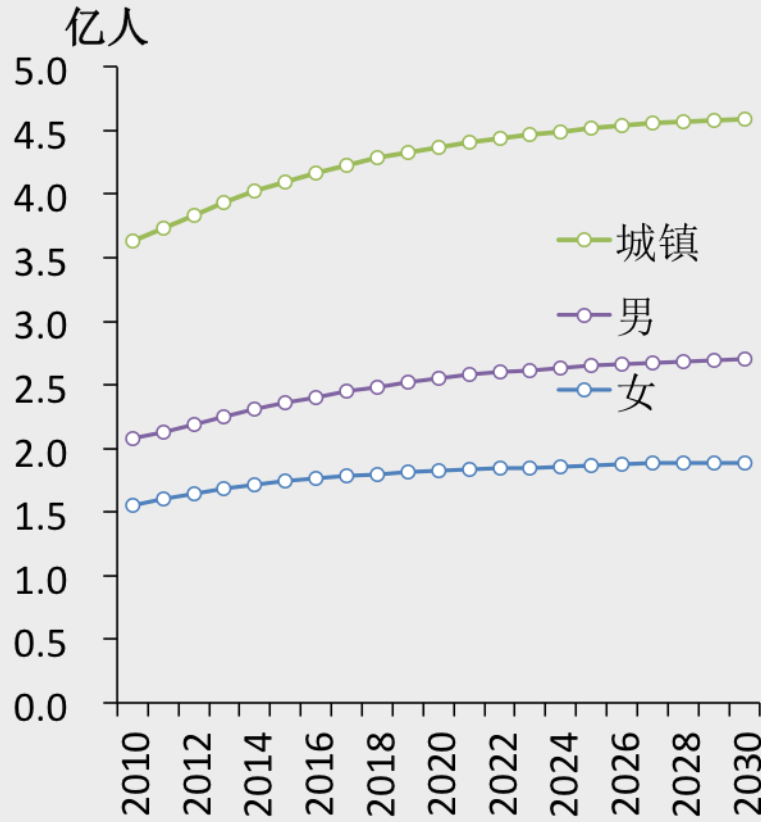
## **How to promote the transformation of the Chinese society towards modernization**

- **Efforts should be made to optimize and modernize the social structure and continue to expand the percentage of middle-income group.**

# **1. Industrial innovation, industrial upgrading, and economy restructuring**

- China will press ahead with agricultural modernization and new agriculture to build a new industrial system.
- **2. Urbanization and social restructuring**

# The trend of changes in labor force population in rural and urban areas from 2010-2030





### **3. Can migrant workers join the middle-income group?**

- **At present, 270 million migrant workers in cities and towns**
- **The rise of their social status.**
- **Why do they have technology but are low in status? Only a small part of Chinese farmers hold a technology certificate.**

# 4. Adjustment of income distribution

- The status quo of China's income distribution
- Change of Gini coefficient
- Remains high but has seen a favorable turn
- How to adjust income distribution: tax adjustment, property tax, inheritance tax.

## **5. Education and formation of a middle-class society**

- Education serves as the most orthodox channel to raise one's social status**
- A number of systems and mechanisms are linked to education**
- The college expansion plan has an impact on the social structure**

- **The emerging automation technology needs labor with higher quality.** These can be achieved by improved the number and the quality of formal education, and by increased the availability of the basic and the advanced vocational education.
- In China, from 2000 to 2010, the number of graduates whose bachelor's degree was science and technology was growing at 13.6%.

- In 2010, China awarded more than 318000 bachelor's degree in natural science and 813000 bachelor's degree in engineering. However, considered China's huge workforce, this was only a low level of progress.
- Education is the most basic and most efficient way to improve the quality of the people, it is valuable for narrowing the quality gap of people, and then to reduce the unfair degree.

-

# **The formation of a diamond-shaped society**

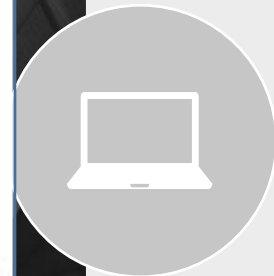
- **By 2040, white-collar workers in China will outnumber blue-collar ones**
- **The percentage of the tertiary industry workers will account for around 52% of China's total workers**
- **As opposed to only 11.7% in 1978**

- **By 2050, the percentage of white-collar workers will increase further to some 60% of the national total.**
- **And by then, the middle-income group will emerge as the mainstay of the Chinese society**
- **The formation of a diamond-shaped society.**



To solve the problem of human resources supply

Combination of Higher education,  
vocational education  
and skills training



STEM Education

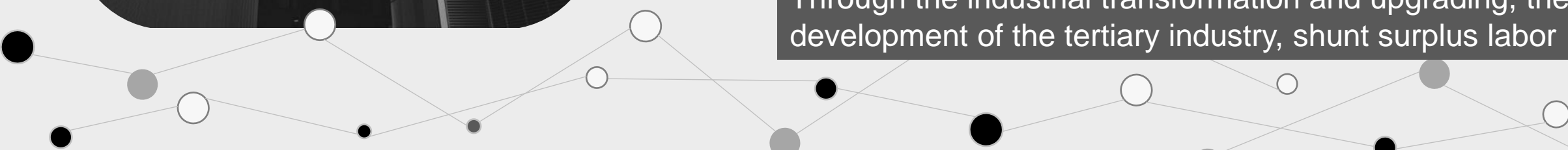
Science  
Technology  
Engineering  
Mathematics



Improve the qualification system

Only a small part of Chinese migrant workers hold a technology certificate.

Through the industrial transformation and upgrading, the  
development of the tertiary industry, shunt surplus labor







**Multiple Modernities**

**Global Governance**  
**Strengthened multi-country dialogue**

**Multi-agent participation**



**THANKS**

