Structural change in the Chinese economy

Changing trade relations with the world

Eddy Bekkers
Robert Koopman
Carolina Lemos Rego

World Trade Organization
Some stylized facts of Chinese economy

- Large changes Chinese economy in the last 40 years
  1. Spectacular GDP growth leading to the status of a middle-income country
  2. Large number of workers moving from agriculture into manufacturing and services.
  3. Extraordinary export growth making China the largest exporter in the world with most of the exports in manufacturing

- Three remarkable features characterize the Chinese economy.
  1. A very high savings rate in comparison to other main economies
  2. A high share of production and exports in manufacturing
  3. A current account surplus (until recently)
    - In particular, a large bilateral trade surplus with the United States
Growth Chinese real GDP and value of GDP (trillions $)
Development of GDP per capita of the BRICS countries
Share of manufacturing sector value added in total value added
Goods and services exports of China, the USA, and Germany
Gross savings rate (China and global average) and value of gross savings in China
Development of current account as a percentage of GDP
Introduction

Approach

- We use the WTO Global Trade Model (GTM) to explore the impact of structural change in China on size and pattern of international trade.
- We model three trends related to structural change in China:
  - A falling savings rate because of demographic changes.
  - A rising share of skilled workers because of increasing education levels.
  - Faster productivity growth in technology advanced manufacturing sectors prioritized by Made in China 2025.
Outline

1. Introduction
2. WTO Global Trade Model
3. Baseline projections: construction
4. Baseline projections: results
5. Structural change in China: construction of shocks
6. Structural change in China: impact
7. Concluding remarks
We use the WTO Global Trade Model (GTM) to construct a baseline projection of the global economy until 2030/2040.

The GTM is a recursive dynamic computable general equilibrium model, describing the economic behavior of firms, consumers, the government, and workers in different regions and their trade interactions:

- General equilibrium: all markets should be in equilibrium
- Computable: disciplined by data on the size of economies, trade flows,..
- Recursive dynamic: solved period-after-period

Baseline projection: benchmark development of the global economy from 2014 until 2040 without taking into account structural change in China.

Some technical details model:

- Multiple sectors, intermediate linkages
- Varying income elasticities, multiple production factors
- Endogenous capital accumulation, savings and investment
- Nested Armington to model trade
Construction of baseline

- Start from 2014 base data on the size and structure of production, demand, and trade flows in 15 sectors, 12 regions, and 5 factors of production.
- Use macroeconomic projections from the UN, the OECD, and IIASA on respectively population growth and labour force growth, growth in GDP per capita, and changes in the number of skilled workers.
- Impose these projections on the CGE-model to calculate the development of trade, sectoral production and demand, investment flows, trade balances, ...
- Additional features of the projections:
  - Differential productivity growth across sectors (based on empirical estimates): stronger productivity growth in agriculture and manufacturing than in services.
  - Changing savings rates as a function of GDP per capita relative to US GDP per capita, GDP growth and demographic changes.
  - Changing preferences away from food and towards services as countries grow richer.
Baseline projections: results

Three main features:

1. Differential productivity growth raises the share of services in the economy and reduces the share of manufacturing and agriculture
   - Lower productivity growth of services (education, health care, hotels, restaurants) raises their price relative to manufacturing and agriculture
   - With limited substitution possibilities of consumers the share of services in the economy rises

2. The geographic distribution of trade is changing with developing countries taking over the dominant position in global trade from the developed countries:
   - Mainly because of larger projected income growth in emerging countries

3. The sectoral distribution of trade follows the production pattern driven by structural change, featuring a rising share of services trade at the expense of manufacturing trade.
Baseline projections: results

Value added share of manufacturing and services

In 2016

In 2030

Manufacturing

Services

Bekkers et al.
Structural change China
Geneva, 24.6.2019 14 / 29
Export shares of regions in global exports in 2016 and 2030

**2016**
- 1 OtherDev: 18%
- 2 OtherAsia: 8%
- 3 Japan: 7%
- 4 China: 14%
- 5 India: 2%
- 6 ASEAN: 7%
- 7 USA: 2%
- 8 Brazil: 5%
- 9 LAC: 13%
- 10 EU28: 2%
- 11 MENA: 18%
- 12 Nigeria: 8%
- 13 SSA: 1%
- 14 ROW: 8%

**2030**
- 1 OtherDev: 16%
- 2 OtherAsia: 4%
- 3 Japan: 9%
- 4 China: 12%
- 5 India: 8%
- 6 ASEAN: 4%
- 7 USA: 16%
- 8 Brazil: 3%
- 9 LAC: 9%
- 10 EU28: 6%
- 11 MENA: 16%
- 12 Nigeria: 1%
- 13 SSA: 4%
- 14 ROW: 1%
Export shares of aggregate sectors in 2016 and 2030
Structural change in China: construction of shocks

1. Falling savings rate
   - Baseline projections project a fall to 42% in 2030
   - World Bank projected in 2012 in report on structural changes in Chinese economy that gross savings rate would decrease to 33.5% by 2030.
   - Continuing trend leads to further fall of the savings rate to 25%

2. Rising share of skilled workers
   - World Bank projected that the share of skilled workers in the Chinese economy would reach “advanced countries” levels by 2040.
   - The share of skilled workers projected to increase to about 40% in 2040.

3. Rising productivity growth in targeted manufacturing sectors
   - Chinese State Council presented Made in China 2025 in May 2015 aimed at promoting high-end manufacturing sectors such as aviation, maritime and rail equipment, new-energy vehicles and electronic equipment
   - Concrete goal to raise self-sufficiency rates through investment in technological innovation
   - Translated into target for increased domestic market share of four sectors included: motor vehicles, electronic, other transport, and machinery equipment through higher productivity growth
Structural change in China: impact on Chinese economy

1. Falling savings rate from 0.49 in 2015 to respectively 0.38 and 0.25 in the baseline and the experiments leads to rising share of private household consumption from 0.38 in 2015 to 0.44 in the baseline and 0.52 in the experiments
   - Share of government consumption rises relatively much more, from 0.13 to 0.18 (baseline) or 0.22 (experiments)
   - Baumol disease effects strongest for government sectors

2. Trade surplus stays virtually constant in baseline, but turns into a deficit with the experiments
   - Accounting identity: $S - I = X - M$
   - Savings fall much more than investment, since investment is determined by attractiveness to invest in China, which does not change with the shocks
     - Adjustment would be less drastic with Feldstein-Horioka closure, under which national investment largely follows national savings

3. Services share displays a huge increase in the baseline due to differential productivity growth
   - Shocks have counteracting effects on shares of different sectors
The share of household consumption in GDP in China

Household Consumption (Share of GDP) - China

- Baseline
- Experiment 1
- Experiment 2
- Experiment 3
The trade balance as a share of GDP in China
The contribution of three broad sectors (baseline)
The share of four broad sectors in GDP

- Share of Agriculture (China)
- Share of Natural Resources (China)
- Share of Manufactures (China)
- Share of Services (China)
The share of Chinese exports in global exports rises in the baseline from 0.16 to 0.19, whereas it fall to 0.11 under the experiments.

Market shares of Southeast Asia and SSA-MENA in Chinese exports rise, whereas the market shares of Japan, the USA, and the EU fall.

Share of manufacturing exports in total exports of China falls lightly.

Revealed comparative advantage changes are mainly driven by Made in China 2025 productivity shocks:

- Fall for light and heavy manufacturing and other manufacturing (textiles for example)
- Big increase for electronic equipment

The bilateral trade surplus of China vis-a-vis the United States rises from about 300 billion in 2015 to 450 billion in 2040 in the baseline, whereas it gets close to zero (50 billion) with falling saving rates.
The share of Chinese exports in global exports

Share of Chinese Exports (Global)

- Baseline
- Experiment 1
- Experiment 2
- Experiment 3
The share of Chinese exports to different destinations

![Bar chart showing the share of Chinese exports to different destinations, with categories for Oceania, Japan, East Asia, Southeast Asia, South Asia, Canada-Mexico, USA, Latin America, EU28, SSA-MENA, and Rest of World, and four scenarios: Base 2015, Base 2040, Exp 1 2040, Exp 2 2040, and Exp 3 2040.]
The share of manufacturing exports in China

Share of Manufactures (China, Exports)

Simulation 31 (Baseline)  Simulation 32  Simulation 33  Simulation 34
Revealed comparative advantage of Chinese exports by sector
The bilateral trade surplus of China vis-a-vis the US

Bilateral Trade Balance (China - USA)
Concluding remarks

- Studied the impact of three trends related structural change in China on international trade patterns
  - Falling savings rates
  - Rising share of skilled workers
  - Rising productivity in high-end manufacturing sectors in China

- Structural change in China is projected to:
  - Raise the share of consumption in GDP
  - Turn China’s trade surplus into a trade deficit and in particular reduce bilateral trade deficit
  - Reduce China’s share in global exports
  - Raise the share of services in both production and exports
  - Shift the destination markets of Chinese exports from developed to developing countries, and change the pattern of comparative advantage