ECON4033 Money and Finance in China

Week 4: Consumption and Saving in China[1]

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[1] These lecture notes are largely based on the materials prepared by Prof. Siu Kee Wong for the same topic.

Table of Contents

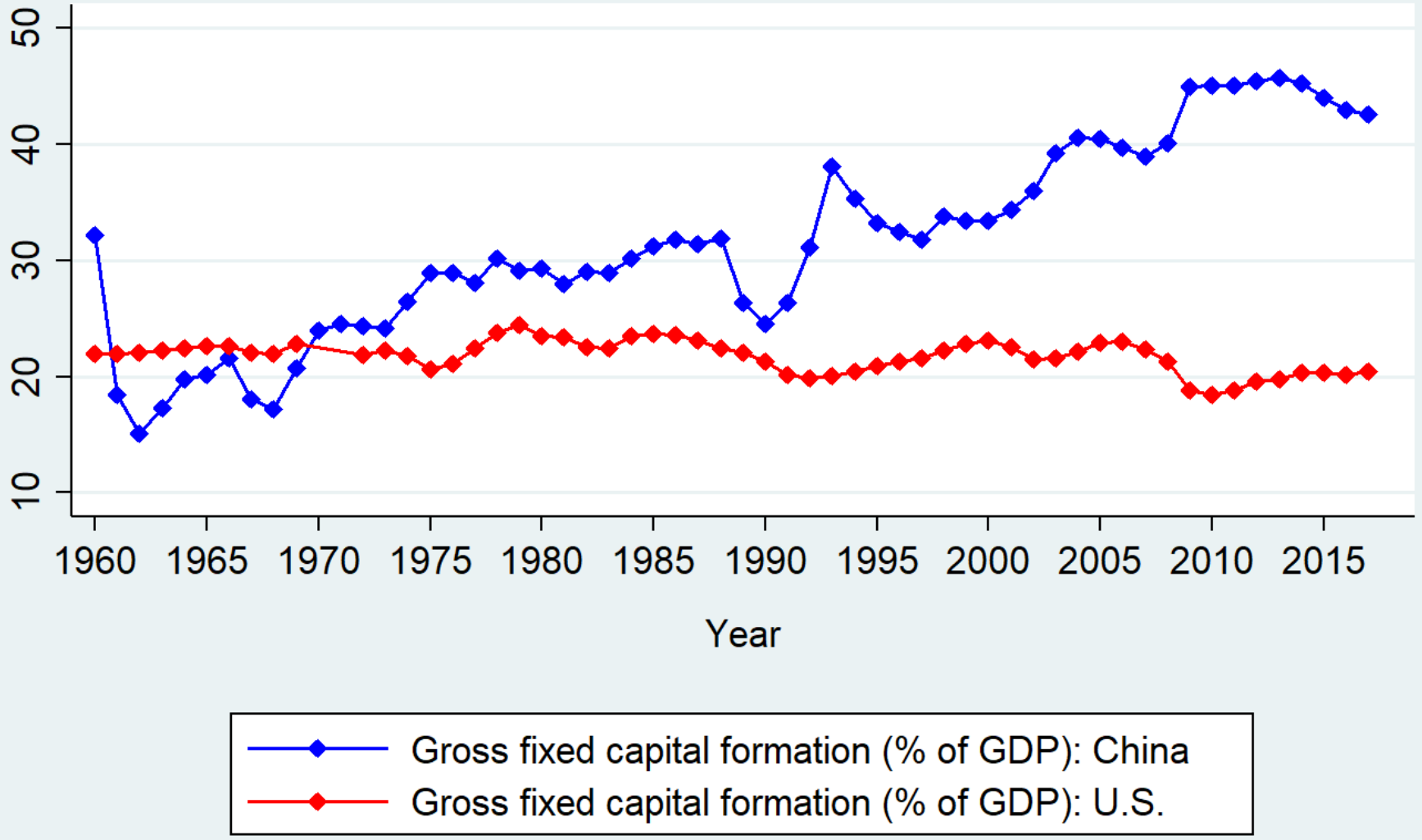
I. Sources of Funds for Fixed Assets Investment: The Role of Saving

- Recall balance of payment exercise tells us that, in an open economy, aggregate investment (I) equals national saving (S) minus current account (CAB), where national saving is the sum of private saving (S^p) and government saving (S^g):

$$\begin{aligned} I &= S - CAB \\ &= (S^p + S^g) - CAB. \end{aligned}$$

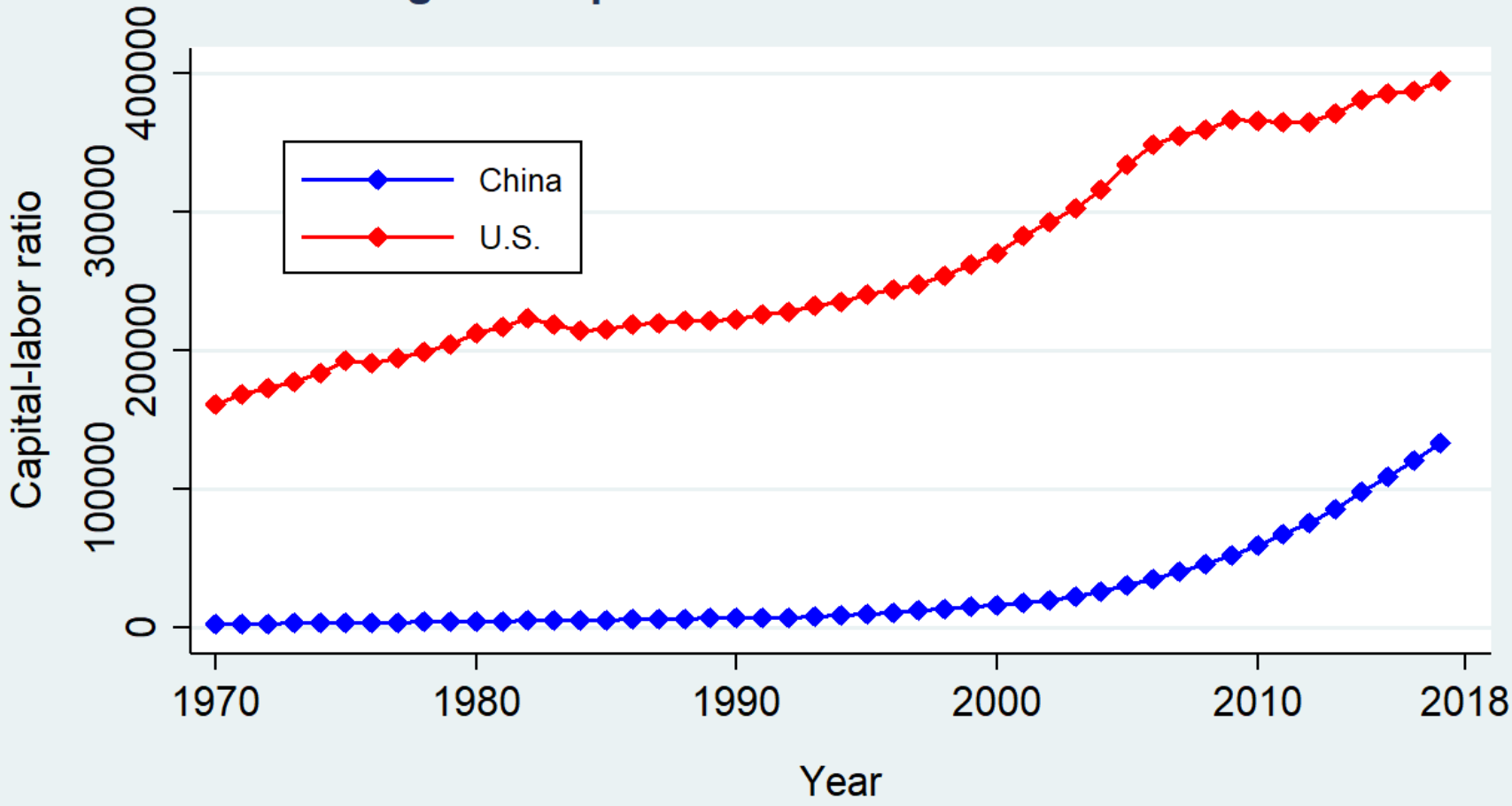
- In terms of the source for investment, investors in China rely not only on their own saving, but also on the household and government savings to finance investments.
- The quantity and quality of investments largely depends on how effectively the financial system mobilize and allocates saving.
- Investment as a share of GDP has been very high (see the figure on page 3). On the other hand, the capital-labor ratio of China remains low (see the figure on page 4), indicating that there is still room for capital accumulation.
- The predominant way of investment financing in China is "self-financing", which consists mainly of retained earnings, funds raised through bond issues and in informal markets (see the figure on page 5).
- Self-financing is particularly important for private and collective enterprises since they have limited access to bank loans and other form of formal finance.

Figure: Gross Fixed Capital Formation as % of GDP (1960 - 2017)



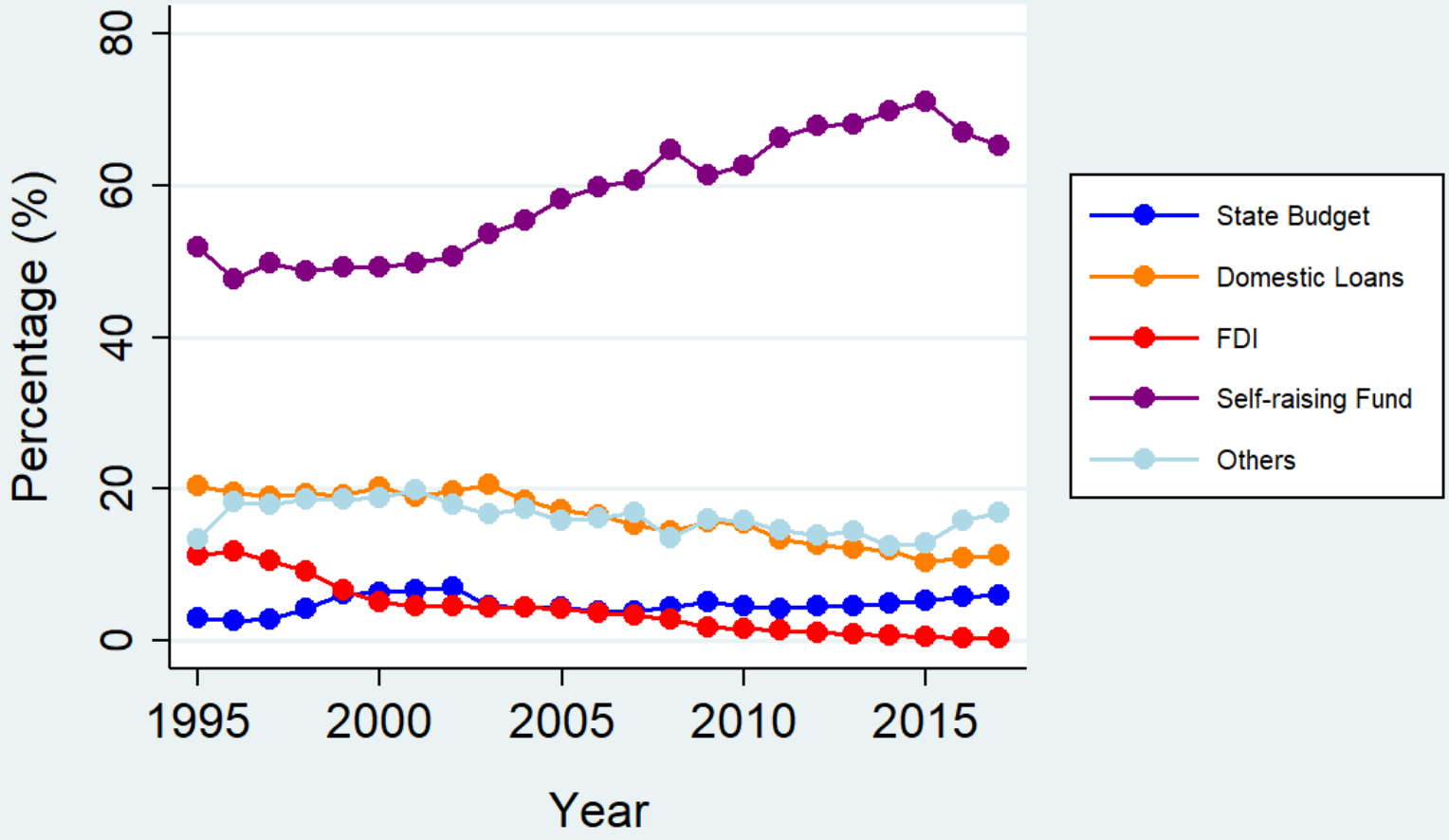
Data source: https://data.worldbank.org

Figure: Capital-labor Ratio of China and U.S.



Note:
1. Capital-labor ratio = Capital stock at current PPPs (in mil. 2011 US$) over Number of persons engaged (in mil.).
2. Data source: Penn World Table version 9.1 at https://www.rug.nl/ggdc/productivity/pwt/.

Figure: Sources of Funds as a Fraction of Total Fixed Asset Investment (%, 1995 - 2017)



Data source: http://data.stats.gov.cn/english/easyquery.htm?cn=C01.

II. Financial Flows between Sectors

- The national income accounts provide a framework for identifying the sources of external finance.

$$GNP = C + I + CAB$$

where $GNP = GDP +$ net factor income receipts , $C =$ consumption (private and government), $I =$ investment and $CAB =$ current account balance.

- Since *GNP* is also equal to the sum of consumption and saving *S*, we can write

$$I = S + F$$

where $F = -CAB$ is the change in the foreign liabilities of the private and public sectors, as such, it is a measure of the net inflow of foreign saving.

- The flow-of-funds data from the China Statistical Yearbook provide a breakdown of income for four sectors of the economy:

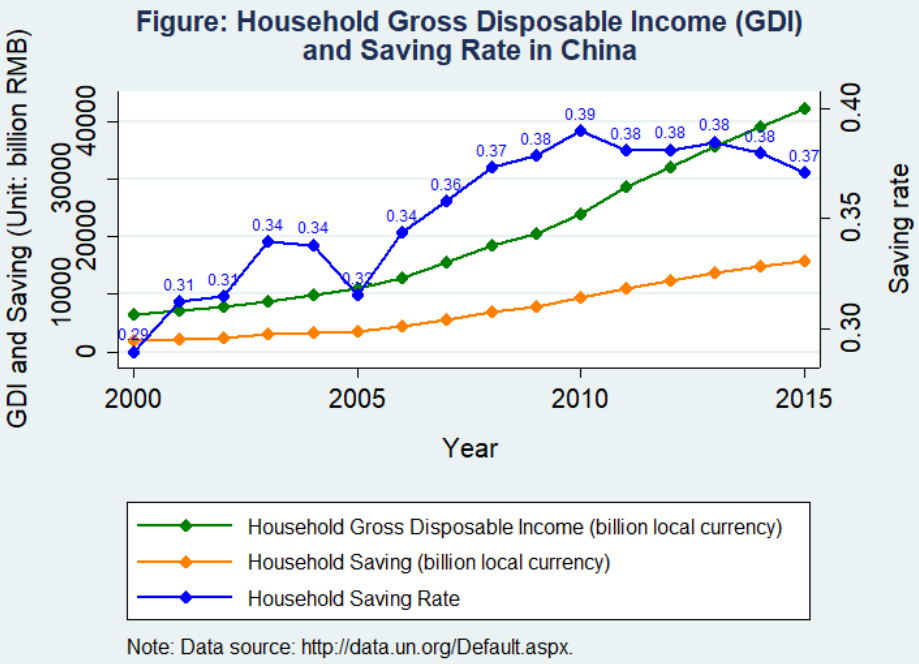
1) public and private nonfinancial enterprises (E)
2) public and private financial institutions (FI)
3) households (H)
4) central and local government (G).

Thus, the $S - I$ identity can be written as:

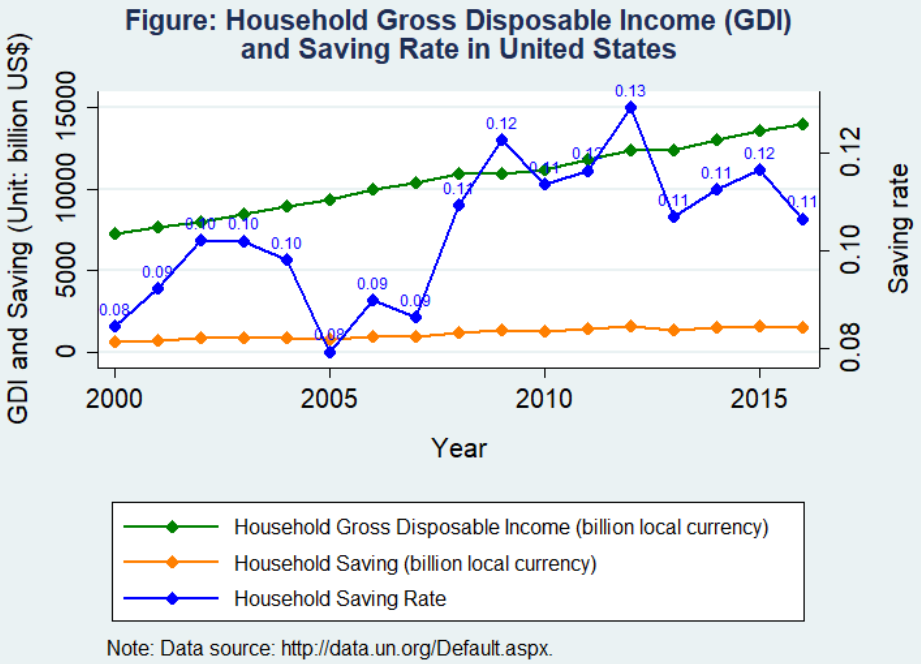
$$(S_E - I_E) + (S_{FI} - I_{FI}) + (S_H - I_H) + (S_G - I_G) + F = 0.$$

III. Personal Consumption and Saving Behavior: Theory and Stylized Facts in China

- **Household Saving Rate: China vs. US**



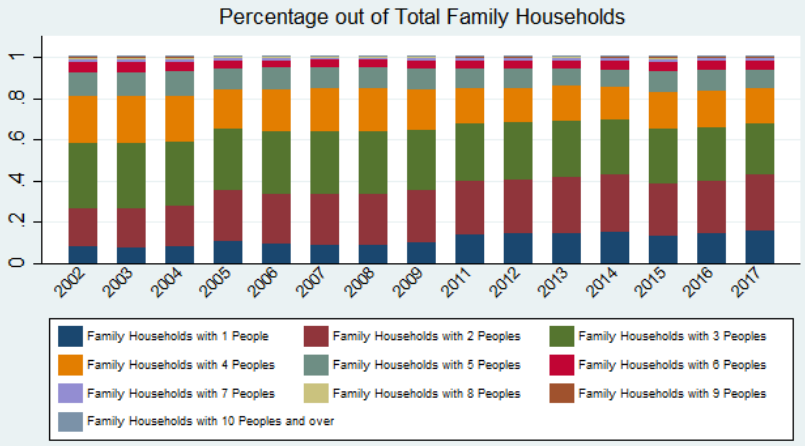
Note: Data source: http://data.un.org/Default.aspx.



Note: Data source: http://data.un.org/Default.aspx.

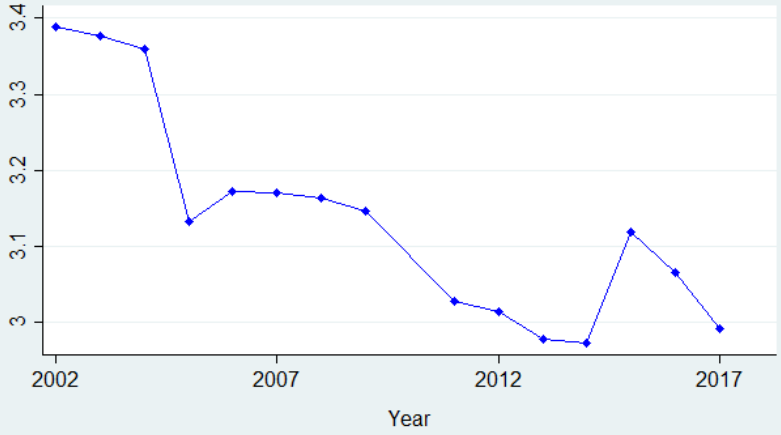
- **Demographic Structure and Size of Household in China**

Figure: Family Households by Size in China



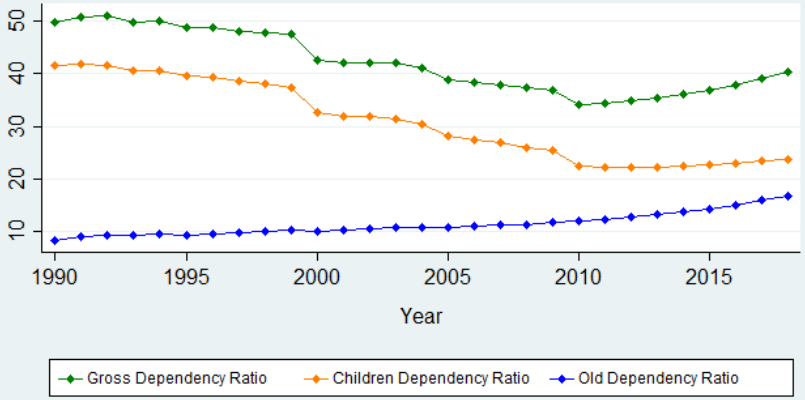
Data source: National Bureau of Statistics of China.

Figure: Weighted Average Household Size in China



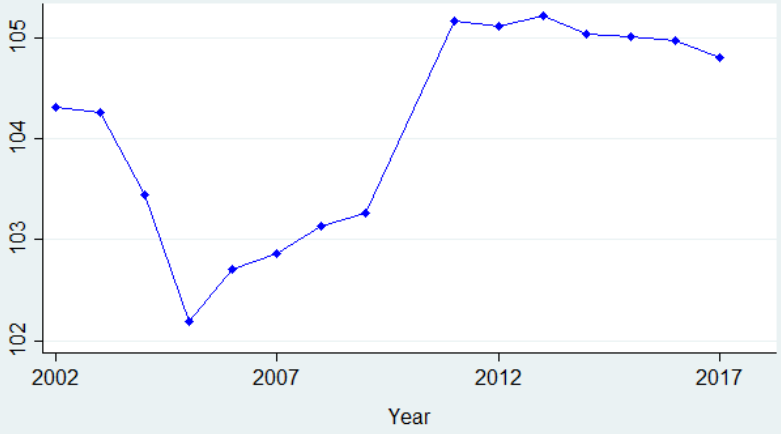
Data source: National Bureau of Statistics of China.

Figure: Dependency Ratios (%) in China



Notes:
1) Data source: National Bureau of Statistics of China.
2) The dependency ratio is the number of dependents in a population divided by the number of working age people. Dependents are defined as those aged zero to 14 and those aged 65 and older.

Figure: Gender Ratio in China



Data source: National Bureau of Statistics of China.

- **Theoretical Considerations of Consumption Decision**

  1) Permanent Income Hypothesis

  - More modern theories emphasize savings in its role as smoothing consumption. In other words, savings act as a buffer to either unanticipated shocks to income or anticipated long-run changes in income.

  - Temporary changes in income have a smaller impact on consumption than do permanent changes according to Friedman's permanent income hypothesis (PCH) and so, for example, a temporary increase in income will tend to be saved — so as to maintain a smooth (balanced) consumption pattern over time.

  - Consumption Smoothing:

    — To understand how consumption smoothing could improve well-being of a country, consider an economy where its output is only used for consumption. Without financial market, $c_1 = y_1$, $c_2 = y_2$ where c_i and y_i are consumption and income in period i, $i = 1, 2$, respectively.

    — Assume that, if the economy is normal, $c_1 = y_1 = 100$, $c_2 = y_2 = 100$.

- Consumption Smoothing (cont.):
  - Now suppose a natural disaster hits the economy and y_1 and c_1 drops to 80.
  - If international lending and borrowing is allowed, the country can borrow in the international market to smooth consumption over time. The budget constraint for the country becomes

$$c_1 + s = y_1$$

$$c_2 = y_2 + s(1 + r)$$

where s is saving (dissaving if negative) and r is interest rate.

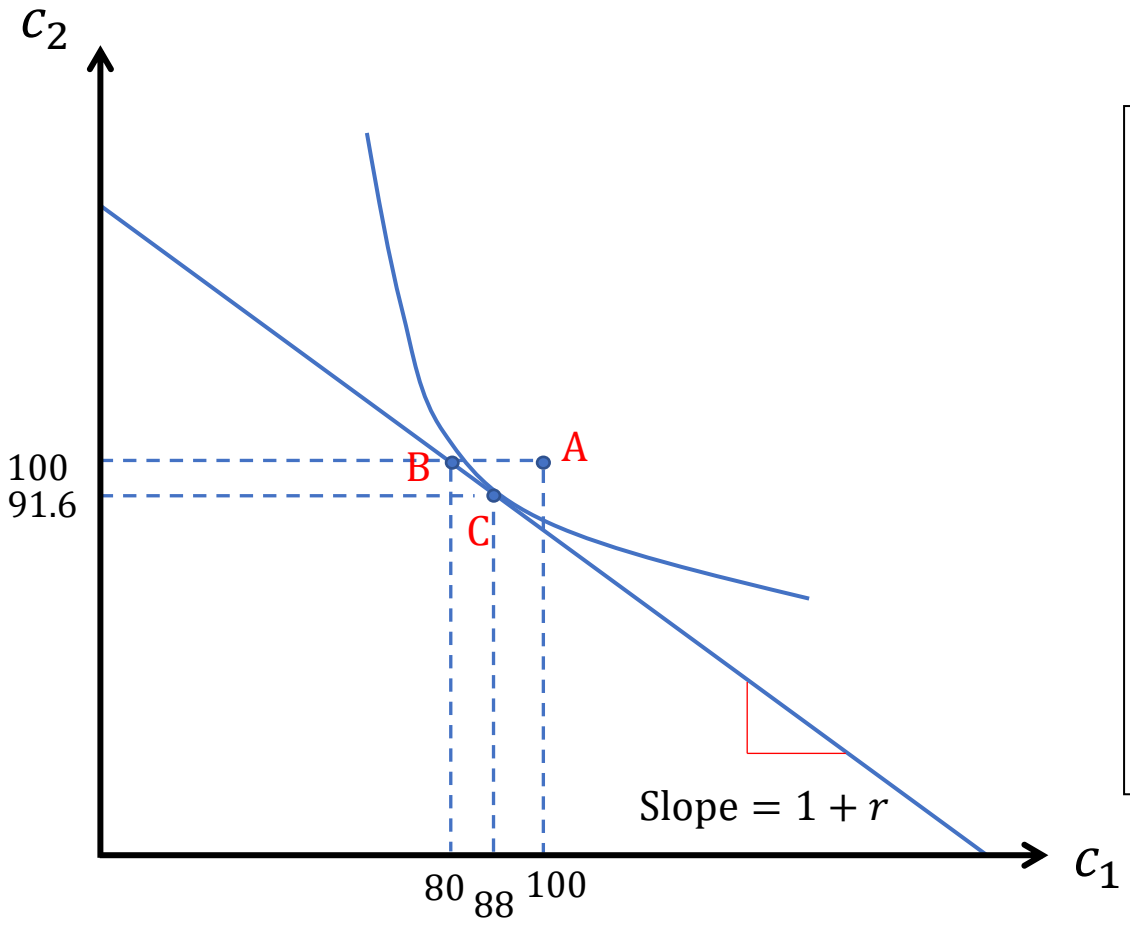
  - Combining these last two equations, we get the intertemporal budget constraint:

$$c_2 = y_2 + (y_1 - c_1)(1 + r) \text{ or}$$

$$c_2 + c_1(1 + r) = y_2 + y_1(1 + r)$$

The balance of payment in period 1 is just $y_1 - c_1 = s$.

- Consumption Smoothing (cont.):
  - Suppose $r = 0.05$. The intertemporal budget is shown in the following diagram. Now the country chooses to have $s = -8$ so as to increase $c_1 = 88$.



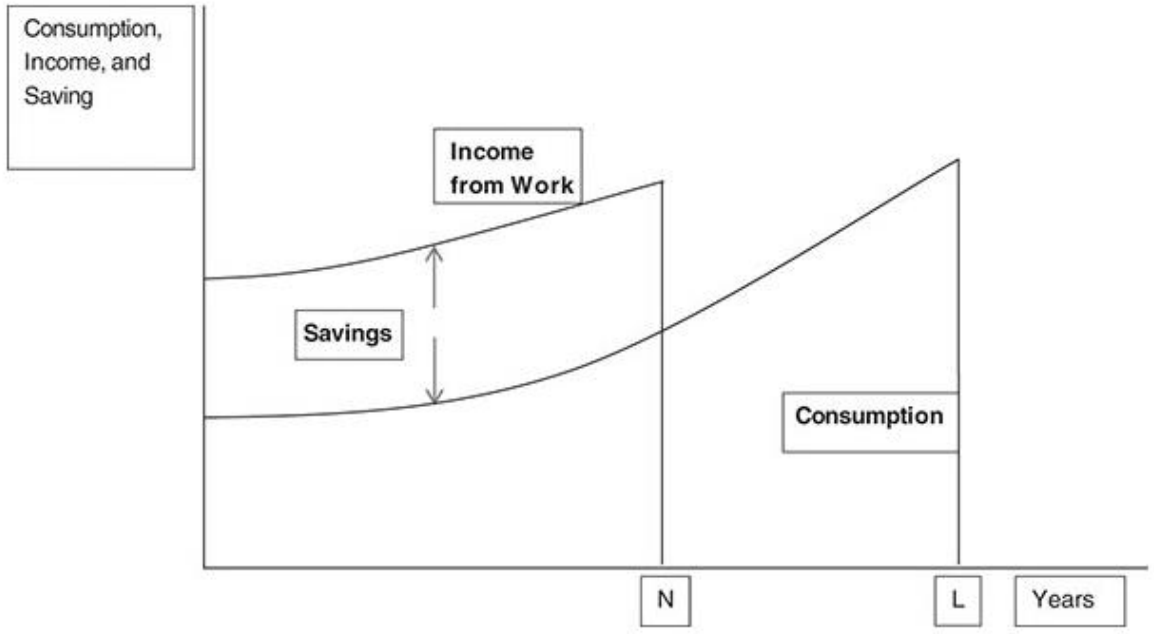
In the second period, the country has to pay back the principal and the interest and c_1 is 91.6. (point *C* in the diagram. This can raise the well-being of the country.

For example, suppose the utility function is $u = c_1 c_2$, which measures consumer welfare. Without borrowing, $u = 80 \times 100 = 8000$. Borrowing raises welfare which is now $u = 88 \times 91.6 = 8060.8$.

2) Life Cycle Theory of Saving

- In Modigliani's life cycle hypothesis (LCH), an individual recognizes three ages of man — youth, working age, and retirement. Before retirement, we save money; during retirement, we dissave.

- Roughly speaking, the saving that is undertaken during our employment years matches the consumption undertaken during years of retirement. Clearly, it suggests a strong role for age distribution and the dependency ratio within a society in determining the savings rate.



Source: Schramm (2015)

3) Liquidity & Borrowing Constraints

- Liquidity constraints represent the inability to convert wealth into purchasing power with ease, for example, from penalties for early withdrawal from time deposit. Borrowing constraints represent the inability to borrow in the capital market.

- Under these constraints, individuals consume up to their current income in contrast to consuming up to their wealth. These constraints are more likely to occur in developing economies where capital markets are undeveloped.

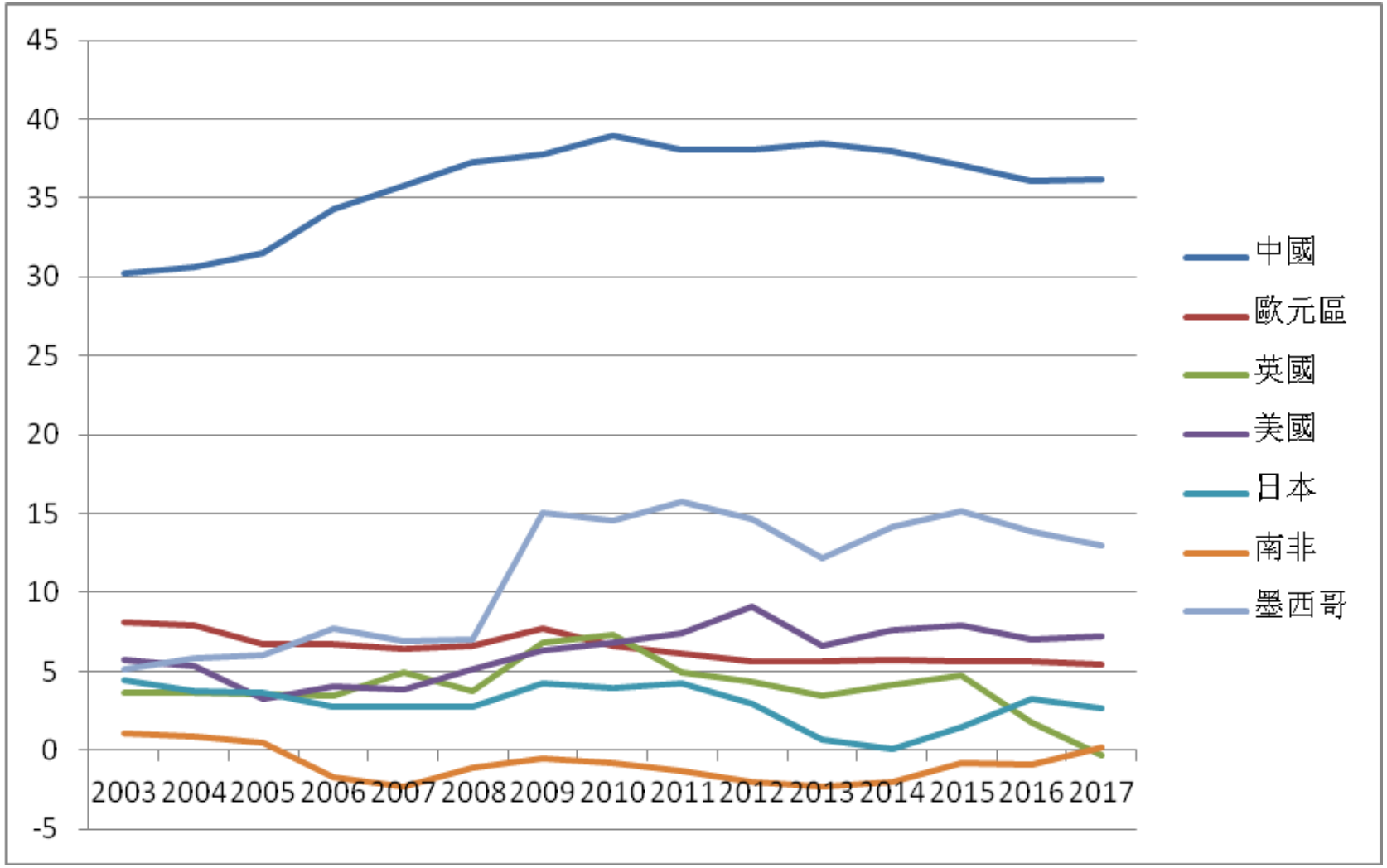
- Liquidity or borrowing constraints tend to raise the saving rate. In particular, individuals must save for the down payment or purchase price of these items in the absence of a financing option. Purchases may not occur which reduces consumption and increases the savings rate.

- **High Household Saving in China**

  Household saving rose sharply over the past 30 years in China. There are various explanations for the rise in saving rate.

  - The decline in the child dependency ratio allow households to save more.
  - The riches save more than the poor and income distribution change in favor to the riches.
  - Habit formation: Consumption habit lagged behind income growth.
  - Inadequate social securities and services provided by the government (precautionary saving).
  - The competitive saving motive as a response of gender imbalance.[2]

[2] Shang-Jin Wei and Xiaobo Zhang, "The Competitive Saving Motive: Evidence from Rising Sex Ratios and Savings Rates in China", Journal of Political Economy, Vol. 119, No. 3 (June 2011), pp. 511-564.



Sources: OECD web site (https://data.oecd.org/natincome/saving-rate.htm) and China Statistic Yearbook 2019.

IV. Corporate Saving in China

- **Definition and Calculation:**
  - In China, total enterprise saving is equivalent to the total disposable income of the business sector.
  - The rise in corporate saving, can partly be attributable to China's expansion continued after China's accession to WTO in 2001.
  - As defined by Flow of Funds Accounts (FFA), enterprise saving equals the value-added of both financial and non-financial companies minus labor compensation, production taxes, net asset payments, and net transfer payments.
  - The formation of fixed capital, capital transfers, changes in inventory, and equity investments are not deducted from corporate income in the calculation of enterprise saving.

- **High Corporate Saving in China**
  - The slow growth of wage cost helps the enterprises to keep high savings.
  - Firms only pay a small amount of profit to shareholders as dividend.
  - Most of the investments are still financed by self-fundraising due to the imperfection of the financial markets, especially for SMEs.

- **Dividend Policy in China**
  - The payout ratio (dividend/corporate income) is low in China.
  - Haldane (2010) estimates that for 2009, the average dividend payout ratio in the United States was 40 percent, with fewer than 25 percent of listed firms paying no dividend at all.
  - In China, the average payout ratio was 18 percent with more than half of listed firms paying no dividends at all.

- **Pecking Order Theory: An Explanation for Low Payout Ratio**
  - This approach argues that retained earnings are a cheaper source of finance than new share issuance because of asymmetric information. While a firm may have inside information about a good investment opportunity, that may not be understood by those providing external sources of finance.
  - Share issuance may also be interpreted by outsiders as an indication that managers view the current share price as being overvalued. As a result, new share issuance can be more expensive relative to the use of retained earnings.
  - Conclusion: firms should have a low payout ratio.

V. Government Saving in China

- **Definition:**

  1) Government disposable income:

  $$\begin{aligned}\text{Government disposable income} = {} & \text{value added in production} \\ & + \text{net taxes in production} \\ & + \text{net income in properties} \\ & + \text{net current transfer}\end{aligned}$$

  2) Government saving:

  Government saving is the difference between government revenue (disposable income) and current expenditure (capital investment not included).

- **High Government Saving in China**
  - High Growth rate in the past 20 years led to the rise in government saving.
  - The tax reform in 1994 ensures that the government receives stable tax revenue.

- **Sources of Government Disposable Income and Saving**

Year	Value added in production	Labor compensation	Net taxes on production	Net income from properties	Net current transfers	Total disposable income	Consumption	Saving	Saving as share of GDP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2000	7808.920	6438.330	11869.360	-374.760	1448.860	14314.050	15661.400	-1347.340	-0.013
2001	9110.680	8052.720	12847.340	-208.020	2626.900	16324.180	17498.000	-1173.820	-0.011
2002	11389.160	9712.770	14611.200	312.360	2905.990	19505.940	18759.900	746.040	0.006
2003	12347.700	10909.730	17348.150	-398.600	3559.290	21946.810	20035.700	1911.120	0.014
2004	14480.210	12768.350	20259.020	-58.220	4604.920	26517.580	22334.120	4183.460	0.026
2005	17113.140	14470.610	23267.370	164.040	6499.750	32573.690	26398.830	6174.860	0.033
2006	19915.500	16651.830	27170.680	938.660	8351.870	39724.880	30528.400	9196.450	0.042
2007	24304.250	20640.860	34710.420	893.050	11925.230	51192.090	35900.400	15291.690	0.057
2008	29688.990	23889.800	39058.110	1691.850	13994.920	60544.070	41752.100	18791.970	0.059
2009	33231.270	27499.130	41752.590	2121.600	12996.990	62603.320	45690.200	16913.140	0.049
2010	36155.690	30784.830	52415.790	2140.080	14189.520	74116.250	53356.400	20759.850	0.050
2011	40363.250	34400.020	61969.970	4133.740	18136.290	90203.230	63154.900	27048.310	0.055
2012	39051.990	33604.980	68604.140	6924.720	20325.230	101301.100	71409.000	29892.110	0.056
2013	42559.670	37081.870	73250.280	10016.960	21630.960	110376.000	81245.900	29130.090	0.049
2014	47757.340	41014.080	78338.120	13185.010	23307.840	121574.230	85773.000	35801.230	0.056
2015	55791.380	48215.860	79350.060	15692.200	24568.350	127186.130	96286.400	30899.740	0.045
2016	62150.530	53966.940	86203.060	12738.170	25243.690	132368.510	106467.000	25901.520	0.035
2017	71373.180	62200.420	93474.300	12424.490	32059.660	147131.210	119188.000	27943.230	0.034

Note: All figures are in nominal billion Yuan. Total disposable income in column $(6) = (1) + (3) + (4) + (5) - (2)$. Saving in column $(8) = (6) - (7)$. See calculation process on the next page.

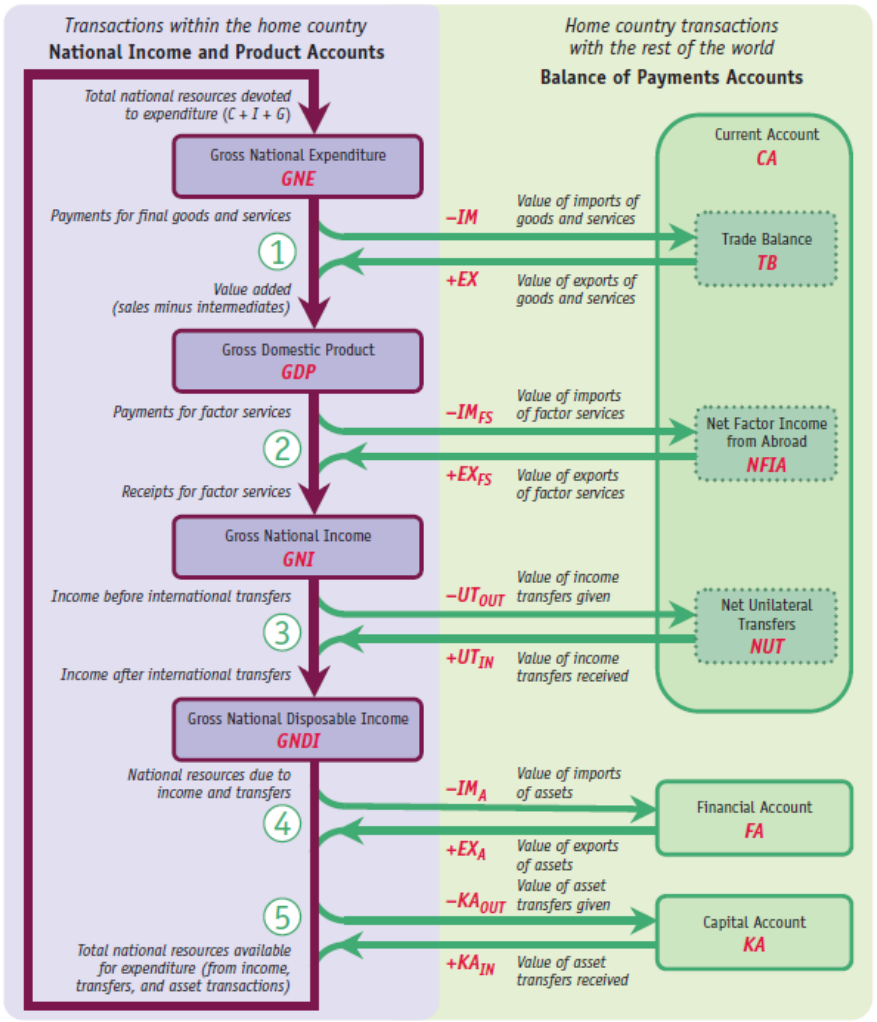
指标	Column	2017 年
政府部门实物交易资金来源增加值(亿元)	(1)	71373.180
政府部门实物交易资金运用劳动者报酬(亿元)	(2)	62200.420
政府部门实物交易资金来源生产税净额(亿元) (a)		93844.280
政府部门实物交易资金运用生产税净额(亿元) (b)		369.980
Net taxes on production	(3) = (a)-(b)	93474.300
政府部门实物交易资金来源财产收入(亿元) (c)		22180.830
政府部门实物交易资金运用财产收入(亿元) (d)		9756.340
Net income from property	(4) = (c)-(d)	12424.490
政府部门实物交易资金来源经常转移(亿元) (e)		106386.850
政府部门实物交易资金运用经常转移(亿元) (f)		74327.190
Net current transfer	(5) = (e)-(f)	32059.660
Total disposable income	(6)	147131.210
政府部门实物交易资金运用最终消费(亿元)	(7)	119188.000
政府部门实物交易资金来源总储蓄(亿元)	(8)	27943.230
国内生产总值(亿元)		832035.900
Government saving/GDP	(9)	0.034

Reference:

Ronald M. Schramm (2015), *The Chinese Macroeconomy and Financial System: A U.S. Perspective*, Taylor and Francis, London.

Haldane, Andrew G. 2010. "Global Imbalances in Retrospect and Prospect." Remarks given at: Global Financial Forum, Chatham House Conference on The New Global Economic Order, November 3, London, England. http://www.bis.org/review/r101223f.pdf.

FIGURE 16-2



The Open Economy Measurements of national expenditure, product, and income are recorded in the national income and product accounts, with the major categories shown on the left. Measurements of international transactions are recorded in the balance of payments accounts, with the major categories shown on the right. The purple line shows the flow of transactions within the home economy; the green lines show all cross-border transactions.

Source: Feenstra and Taylor (2011), p557.

$$\underbrace{GDP}_{\text{Gross domestic product}} = \underbrace{C+I+G}_{\text{Gross National Expenditure (GNE)}} + \underbrace{\underbrace{EX}_{\text{Export}} - \underbrace{IM}_{\text{Import}}}_{\text{Trade balance (TB)}}$$

$$\underbrace{GNI}_{\text{Gross national income}} = \underbrace{GNE+TB}_{\text{GDP}} + \underbrace{\left(EX_{FS} - IM_{FS}\right)}_{\text{Net factor income from abroad (NFIA)}}$$

$$\underbrace{Y}_{\text{Gross national disposable income (GNDI)}} = \underbrace{\underbrace{GNE+TB}_{\text{GDP}} + NFIA}_{\text{GNI}} + \underbrace{\left(UT_{IN} - UT_{OUT}\right)}_{\text{Net unilateral transfers (NUT)}}$$

$$= GNE + \underbrace{TB + NFIA + NUT}_{\text{Current Account (CA)}}$$

$$= C + I + G + CA$$

$$\underbrace{S}_{\text{National saving} = Y - C - G} = I + CA$$

$$CA = \underbrace{(Y - T - C)}_{\text{Private saving } (S^p)} + \underbrace{(T - G)}_{\text{Government Saving } (S^g)} - I$$

$$= S^p + S^g - I$$