西方经济学

Part 1 Understanding Macroeconomic Data

Lecture 1A GDP

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Supplement Readings

(1) M9; S2. [1]

(2) 其他文献：电影《一出好戏 (2018)》

(3) 其他文献：Bai, Chong-En and Zhenjie Qian. 2010. "The Factor Income Distribution in China: 1978–2007." China Economic Review, 21(4), 650-70.

(4) 其他文献：The Data of Macroeconomics

(5) 国家统计局, 国家数据. Bureau of Economic Analysis.
China Statistical Yearbooks:
2023, 2022, 2021,
2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011,
2010, 2009, 2008, 2007, 2006, 2005, 2004, 2003, 2002, 2001,
2000, 1999.

[1] M 指代马工程教材，S 指代课外阅读材料沈坤荣教程。

学习目标

(1) 掌握 GDP 的核算方法，了解 GDP 指标的缺陷。
(2) 熟悉国民收入账户中的常见指标。
(3) 会查阅中国和美国的 GDP 数据。
(4) 掌握两个恒等式。
(5) 掌握马工程教材精神。

观察与思考

中国 GDP 之谜

“我们有的 GDP 数字很好看，但并不是增加了社会财富，是浪费了社会财富。比如讲，建大桥，这是 GDP，让大桥塌了、拆了又是 GDP，再建一次大桥还是 GDP，这样干了三次 GDP，浪费了大量的社会财富，但是真正形成的财富就那一笔。不讲质量的发展，污染了空气、污染了水源，污染的时候创造了 GDP，然后治理污染又创造了 GDP，但是社会财富还是那么一笔。”

——汪洋在广东省委十届五次全会的第二组的分组讨论会发言（2009 年 7 月 17 日《广州日报》）

观察与思考

三驾马车之谜

(1) 国家统计局和答记者问(2024 年 1 月 17 日) 初步核算，2023 年国内生产总值 1260582 亿元，按不变价格计算，比上年增长 5.2%。“最终消费支出、资本形成总额、货物和服务净出口分别拉动经济增长 4.3、1.5、-0.6 个百分点”。

(2) 国家统计局(2023 年 2 月 28 日) 公布 2022 年“三驾马车”对 GDP 的贡献率：“全年国内生产总值 1210207 亿元，比上年增长 3.0%。…… 全年最终消费支出拉动国内生产总值增长 1.0 个百分点，资本形成总额拉动国内生产总值增长 1.5 个百分点，货物和服务净出口拉动国内生产总值增长 0.5 个百分点。”

(3) 央广网转环球网(2022 年 12 月 30 日)：“三驾马车”拉动中国经济。

(4) 财政部(2015 年 10 月 21 日)：“三驾马车”难以成为经济增长根本动力。

(5) 国务院发展研究中心研究员(2014 年 12 月 21 日)：“三驾马车”不是经济发展的根本动力。

Outline

Measuring the Value of Economic Activity

Gross Domestic Product 国内生产总值

Definition 1

Gross domestic product (GDP) in National Income and Product Accounts (NIPA) is the market value of all final goods and services produced in an economy during a specified period, such as a year.

(1) In a market, 非市场：家庭内部分配。利用价格衡量商品价值。房子。

(2) It is a value such that different things can be added. Thus it can be affected by price changes; GDP受市场价格变动影响。

(3) Statistical scope: all, goods and services; 无形的服务 合法商品。

(4) Final goods, rather than intermediate goods. Services are automatically final; 最终商品

(5) Produce. Transfer of used goods is not considered; 存货投资附外。不包括二手产品/历史遗留。

(6) Regional scope: in an economy; 地域性，一定的经济体

(7) A flow variable: during a specified period. 流量

stock variable

The Circular Flow of Funds: Simple

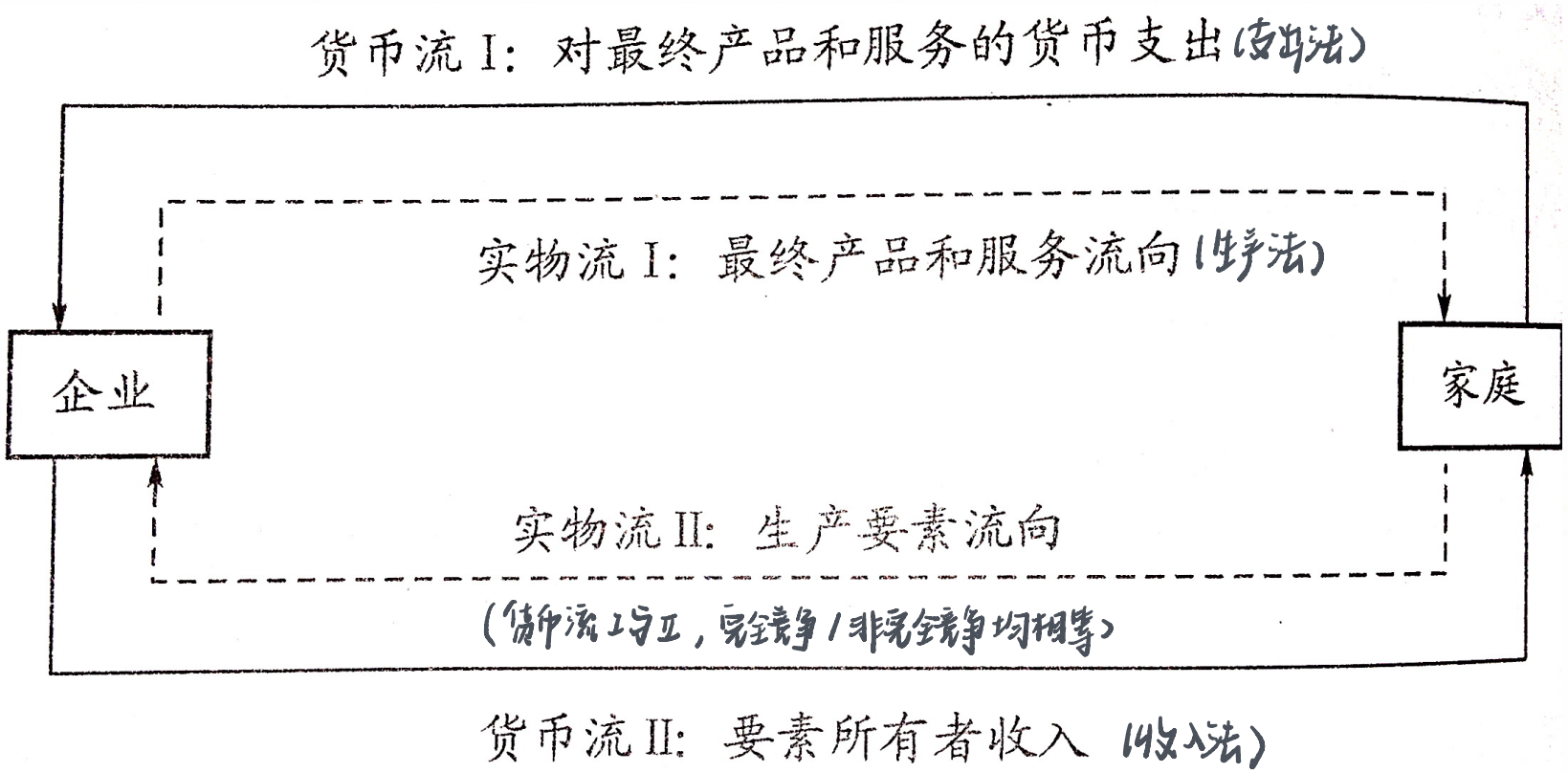


图 2－5　只包括家庭和企业两部门的简单经济流程图

Three Approaches to Measure GDP: product, expenditure and income.

The Product Approach to GDP 生产法计算GDP

The product approach is also called the *value-added* 增值法 approach. The main principle in this approach is that GDP is calculated as the sum of value added to goods and services across all productive units in the economy.

Total Value Added

$$= \sum_i \Big(\text{Market value of unit } i\text{'s output} - \text{Market value of intermediate goods purchased by unit } i \Big)$$

$\sum_i$(售价 - 中间产品价格)

表 2－2　汽车生产过程的几个环节

	售价(万元)	中间产品价格(万元)	增值(万元)
铁矿石、煤炭等	10	0	10
钢铁	15	10	5
汽车	20	15	5
总计	45	25	20

关于一九八三年国民经济和社会发展计划执行结果的公报

有提高成本的倾向，导致经济效率低。

一九八三年，我国各族人民在中国共产党和人民政府领导下，继续贯彻执行调整、改革、整顿、提高的方针，为全面开创社会主义现代化建设新局面而辛勤劳动，在国民经济和社会发展方面都取得了新的成就。全年社会总产值[2]为 11052 亿元，比上年增长 10%。其中工农业总产值为 9209 亿元，比上年增长 10.2%。国民收入初步计算为 4673 亿元，比上年增长 9%。一九八三年工农业总产值和粮食、棉花、油料、原煤、原油、钢材等 33 种主要产品产量，已提前两年达到第六个五年计划规定的一九八五年指标。在生产发展的基础上，市场繁荣兴旺，人民生活继续改善，精神文明建设也有新的进步。国民经济发展中存在的主要问题是：能源和一些原材料供应不足，交通运输仍然紧张，生产、建设和流通领域中经济效益差的状况还没有根本改善；国家财政仍有一定赤字；有些商品特别是蔬菜、水果、水产品等零售价格上升幅度较大。

[2]社会总产值是农业、工业、建筑业、交通运输业、商业 (包括物资供销业和饮食业) 总产值之和。国民收入是上述五个物质生产部门净产值之和。本公报所列社会总产值、工业总产值、农业总产值、国民收入数字，都是按当年价格计算的；比上年增长速度是按可比价格计算的。

The Expenditure Approach to GDP 支出法计算GDP

Total Expenditure= $C + I + G + NX$. $G = G^C + G^I$

(1) C denotes **households' consumption** which is defined as the sum of final goods and services purchased by persons resident in the nation. It is disaggregated into three components: nondurable goods, durable goods, and services. 家庭消费 房子计入I, why? 包含进口产品

(2) I denotes **gross private domestic investment** which is disaggregated into three components: nonresidential fixed investment(the purchase by firms of new plant and equipment), residential fixed investment(the purchase by households and landlords of new housing), and inventory investment. 国内私人总投资 耐用品 非住宅固定投资 住宅固定投资 存货投资

(3) G denotes **government purchases** of goods and services, which consist of purchases of consumption goods (G^C) and purchases of capital goods (G^I). It is not exactly the government spending or outlays. Government spending includes not only purchases of goods and services, but also "transfer" payments and net interest payments. Actually, transfer and net interest payments do not involve new production. Thus transfer and net interest payments are not a part of GDP. 政府购买 消费品 资本品 转移支付 利息支付

(4) NX denotes **net exports** (NX = exports − imports), which is also called the **trade balance**. When $NX < 0$, we say a **trade deficit**. When $NX > 0$, a **trade surplus**. When $NX = 0$, a **balanced trade**. Exports and imports are measured in terms of value added. That is, to calculate GDP, imported final goods and imported intermediate goods, already counted as part of C, I, or G, should be subtracted. 贸易逆差 贸易赤字

The Income Approach to GDP 收入法计算GDP

We add up all income received by economic agents contributing to production.

$$\begin{aligned}\text{GDP} = &\text{Labor Income} + \text{Asset Income} \\ &+ (\text{Indirect Business Taxes} - \text{Subsidies}) \\ &+ \text{Depreciation}\end{aligned}$$

劳动收入 资本收入 间接税-补贴 转移支付 折旧

Income from asset comprises rental income of persons, corporate profits, net interest, and the unknown capital part of proprietors' income. Depreciation is also called consumption of fixed capital.

因此，若利用收入法来核算 GDP，可以将核算公式写成：

GDP = 工资 + 利息支付 + 间接税 + 折旧 + 利润

Asset Income

Other Measures of Income: GNP, NNP, NI

GNP ≡ Gross National Income

Gross national product(GNP) is the total income earned by a nation's permanent residents (called nationals). It is equal to GDP plus **net factor payments**(NFP) from abroad.

净要素收入 NFP

$$GNP = GDP + NFP,$$ 国民生产总值 = 国内生产总值 + 净要素收入

$NFP =$ Factor Payments from Abroad $-$ Factor Payments to Abroad.

外国要素收入 - 外国要素支出

By comparison, GDP measures the total income produced *domestically*. GNP is the total income earned by *nationals or residents of a nation*.

国民生产净值

(净) Net national product(NNP) $= GNP -$ Depreciation;

国内生产净值 折旧

Net domestic product(NDP) $= GDP -$ Depreciation;

国民收入

National income(NI) $= NNP -$ Statistical Discrepancy.

GN ND DI

Gross = Net + Depreciation;

National = Domestic + NFP;

Product = Income + Statistical Discrepancy.

$GNP \equiv GNI$ + 统计误差. (理论相等)

Other Measures of Income: NI 国民收入

NI = NMP − Discrepancy

National income (NI) is the sum of eight components (NIPA Handbook, ch.2):

(1) **Indirect business taxes** are called now **taxes on production and imports**. They include taxes on sales, excise, and value-added. **Subsidies**, if there are, enter into this category as a negative term since they are negative taxes. (Nonfactor charges)

(2) **Current surplus of government enterprises**. (Nonfactor charges)

(3) **Business transfers** to persons, government, or the rest of the world, such as liability payments for personal injury, and corporate contributions to nonprofit organization. (Nonfactor charges)

(4) **Compensation of employees**, or labor income, which comprises wages, salaries, and fringe benefits earned by workers. Social insurance contributions are part of fringe benefits. (Factor incomes)

(5) **Proprietors' income** is received by self-employed persons, including noncorporate businesses. Proprietors' income is a mix of payments to labor and capital, whose breakdown into labor and capital is unknown. (Factor incomes)

(6) **Rental income of persons** is the income landlords receive, including imputed rent that homeowners pay to themselves, less expenses (e.g. depreciation). (Factor incomes)

(7) **Net interest**. Interest paid by private enterprises less interest received by private enterprises, plus interest paid by the rest of the world less interest received by the rest of the world. (Factor incomes)

(8) **Corporate profits** are the sum of taxes on corporate income, dividends and undistributed profits. (Factor incomes)

Other Measures of Income: PI, DPI

Personal income (PI) is the income that persons receive.

$$
\begin{aligned}
PI = NI &- \text{Indirect business taxes} \\
&- \text{Current surplus of government enterprises} \\
&(- \text{Business transfer} \\
&\quad + \text{Personal current transfer receipts from gov and business}) \\
&- \text{Social insurance contribution (domestic)} \\
&(- \text{Corporate profits} + \text{Personal dividends income}) \\
&(- \text{Net interest} + \text{Personal interest income})
\end{aligned}
$$

$$
\begin{aligned}
PI = &\text{Personal current transfer receipts from gov and business} \\
&- \text{Social insurance contribution (domestic)} \\
&+ \text{Compensation of employees} \\
&+ \text{Proprietors' income} + \text{Rental income of persons} \\
&+ \text{Personal dividends income} + \text{Personal interest income.}
\end{aligned}
$$

Disposable Personal Income(DPI) is the amount households and noncorporate businesses have available to spend or save after satisfying their tax obligations to the government.

$$DPI = PI - \text{Personal Current Taxes.}$$

Other Measures of Income: GNFI and NNFI

净国家要素收入

Net national factor income (NNFI on line 32)

= National income

– Net indirect business taxes

– Business transfer

– Surplus of government firms

= Compensation of employees

+ Proprietors' income

+ Rental income of persons

+ Corporate profits

+ Net interest and miscellaneous payments

Gross national factor income (GNFI on line 29)

= NNFI + Consumption of fixed capital.

固定折旧费

Table 1.7.5. Relation of Gross Domestic Product, Gross National Product, Net National Product, National Income, and Personal Income

[Billions of dollars]

Bureau of Economic Analysis

Line		2019	2020
Line			
1	**Gross domestic product (GDP)**	21372.6	20893.7
2	Plus: Income receipts from the rest of the world	1160.3	992.9
3	Less: Income payments to the rest of the world	893.9	770.6
4	**Equals: Gross national product** GNP	21639	21116.1
5	Less: Consumption of fixed capital	3435.6	3575.9
14	**Equals: Net national product**	18203.4	17540.2
15	**Less: Statistical discrepancy**	-69.7	-170.6
16	**Equals: National income**	18273.1	17710.7
	Less:		
17	Corporate profits with inventory valuation and capital consumption adjustments	2367.8	2243.8
18	Taxes on production and imports less subsidies1	1459.4	773.3
19	Contributions for government social insurance, domestic	1421.4	1459.5
20	Net interest and miscellaneous payments on assets	558.2	618.8
21	Business current transfer payments (net)	162.3	158.6
22	Current surplus of government enterprises1	-13.3	-17.5
23	Plus: Personal income receipts on assets	2968	2912.1
24	Plus: Personal current transfer receipts	3139.1	4241.1
25	**Equals: Personal income**	18424.4	19627.6
	Addenda:		
26	Gross domestic income (GDI) GDI	21442.2	21064.3
28	Gross national income GNI	21708.7	21286.6
29	Gross national factor income3 GNFI	20100.3	20372.3
32	Net national factor income4 NNFI	16664.7	16796.3

National Income

在上述国民生产净值中，如销售税之类的间接税是由企业交给政府的，构成消费者所支付的产品价格与企业所得到的收入之间的差额。间接税不构成企业的收入，所以不包括在国民收入之内。

$$NI = NNP - 间接税$$

（四）个人收入（PI）与个人可支配收入（PDI）

国民收入衡量了一国要素所有者的收入，但是国民收入并不等于个

马工程观点 (M, 2011, p.10)

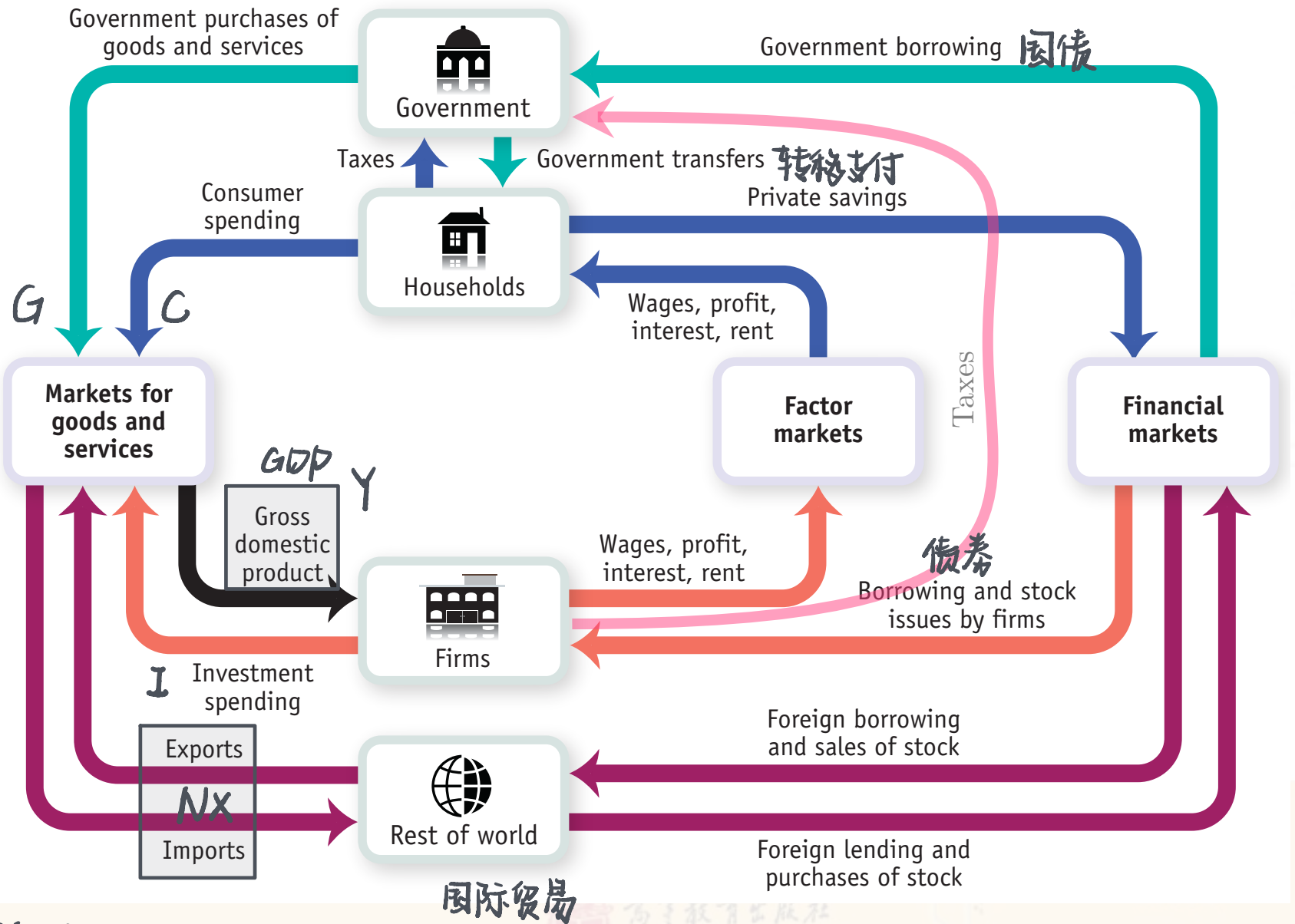
国民收入（简称 NI）是指一国全部生产要素在一定时期内提供服务所获得的报酬的总和，即工资、利息、租金和利润的总和。国民收入与国民生产净值的关系为：

$$NI = NNP - 间接税 - 企业转移支付 + 政府对企业的补贴$$

所谓间接税是指税收负担不由纳税人本人承担的税，即这种税收的负担可以转嫁出去。企业馈赠的礼品是企业转移支付的例子。国民收入这一指标衡量经济中的所有人赚到了多少钱。

个人收入（简称 PI）是指个人得到的收入。国民收入不是个人收入。

Krugman and Weil (2015): The Circular Flow of Funds



有 $Y = G + C + I + NX$

Notes for China's GDP

(1) Aggregation inconsistency. The sum of provincial GDPs is greater than national GDP. (see XinhuaNet)

(2) Most of services are not covered in GDP until Dec., 2005. After the adjustment of scope, GDP in 2004 with adjustment increases by 16.8% relative to GDP in 2004 without adjustment. The adjustment is based on China economic census in 2004.

(3) Research and development expenditure is regarded as intermediate inputs. But National Bureau of Statistics said in 2013 that R&D expenditure would enter GDP as intangible fixed investment in the future according to SNA2008.
(see Sina News and www.guancha.cn)
R&D expenditure entered GDP formally as formation of fixed investment in 2016. [3]

[3] 2016 年 7 月 5 日，国家统计局发布《关于改革研发支出核算方法修订国内生产总值核算数据的公告》。以前研发支出 (R&D) 作为中间消耗不计入 GDP。现在研发支出作为固定资本形成 (I) 计入 GDP. 根据新的核算方法，国家统计局修订了 1952 年以来的 GDP（国内生产总值）数据.

What is Included and What is Not

(1) **Market-price rule**. GDP includes only goods and services that transact in markets.

(2) Exceptions to market-price rule, and imputation. An exception is **owner-occupied housing**. If you rent your house, the rental income is included in GDP. If you live in your house, national accountants estimate a rental equivalent which is included in GDP. The imputed rent is included both in the houseowner's expenditure and in the houseowner's income. Another exception is **government services** which are valued at cost since most of government services are not sold in a market.

(3) The **health** of a nation's people is not considered in GDP.

(4) GDP does not include changes in **environmental resources**.

(5) GDP does not consider income **distribution**.

(6) GDP assigns no value to **leisure time**.

(7) The sales of **used goods** is not included in GDP since it only reflects the transfer of an asset rather than an addition to the economy's income. Sales of used goods lead to no changes of income, no changes of expenditure, and no changes of production.

(8) Investment in **inventory** is counted as an expenditure by producers. Thus production for inventory increases GDP just as much as production for final sale. A sale out of inventory is similar to the sale out of used goods and hence it does not affect GDP.

What is Included and What is Not

(9) No imputation is made for the value of goods and services sold in the **underground economy**. However, some countries try to include the underground economy.

Adult Audiences Only

GDP is supposed to measure the value of all goods and services produced in the economy, but some goods and "services" are sold . . . well, let's say are sold less than openly. The general rule is that national statistical agencies measure whatever is sold legally. Stuff that is sold, but not legally, is generally not measured. In the United States, the government includes the dollar value of prostitution in those parts of Nevada where prostitution is legal—elsewhere it doesn't get counted. The government also counts sales of marijuana in those states that have legalized pot, despite the fact that pot sales remain against federal law.

Britain and Italy began counting prostitution and the sales of at least some narcotics as part of GDP in 2014.[1] While those activities aren't legal in Britain or Italy, they are sometimes legal in the Netherlands. The European countries value creating statistics that are consistent across the continent.

From Dornbusch, Fischer, and Startz (2018)

[1] http://money.cnn.com/2014/05/29/news/economy/uk-italy-prostitution-gdp/index.html?hpt=hp_t2

Outline

The Income-Expenditure Identity

收入-支出恒等式

Proposition 2 (The Income-Expenditure Identity)

Let Y be the total income from domestic production. Then the following income-expenditure identity holds:

$$Y = C + I + G + NX. \tag{1}$$

The Saving-Investment Identity

储蓄-投资恒等式.

$Y + NFP = GNP$.

$CA = GNP - (GNP - NX) = NX + NFP$.

Proposition 3 (The Saving-Investment Identity)

经常帐户

The current-account balance, denoted by CA, is the difference between total income ($Y + NFP$) and domestic total expenditure ($C + I + G$, also called domestic absorption). Then the following saving-investment identity holds: 国内吸收

$CA = Y + NFP - (C+I+G)$
$= C+I+G+NX+NFP-(C+I+G)$
$= NX + NFP$

$$CA = S - \tilde{I}, \quad \tilde{I} = I + G^I. \tag{2}$$

where S denotes the national saving which is the sum of private sector saving (S^{Prv}) [1] and public sector saving (S^G). $\tilde{I}$ denotes the national investment which is the sum of private investment (I) and public investment (G^I). $S - \tilde{I}$ represents net foreign investment (NFI, also called net capital outflow, NCO). For a closed economy, identity (2) implies $S = \tilde{I}$, that is, domestic saving is always equal to domestic investment.

$S = S^{Prv} + S^G$

[1] S^{Prv} = Private disposable income (Y^d) – Private consumption (C). Y^d is the income of the private sector available to spend: $Y^d \triangleq GNP - (T - TR - INT^G)$ where TR the government transfer payments, INT^G the net interest payments from government, T the tax revenue. Y^d comprises disposable income of both households and businesses (ie., the private sector). If we assume $NFP = 0$, $TR = 0$, and $INT^G = 0$, then $Y^d = Y - T$.

Outline

$$S = S^{Prv} + S^{G}$$

$$S^{Prv} = Y^{d} - C$$

$$= GNP - (T - TR - INT^{G}) - C$$

$$= Y + NFP - (T - TR - INT^{G}) - C$$

$$S^{G} = T - TR - INT^{G} - G^{C}.$$

$$\text{故 } S = Y + NFP - C - G^{C} = \underline{C} + I + \underline{G^{C}} + G^{I} + NX + NFP - \underline{C} - \underline{G^{C}}$$

$$= \boxed{I + GI} + CA$$

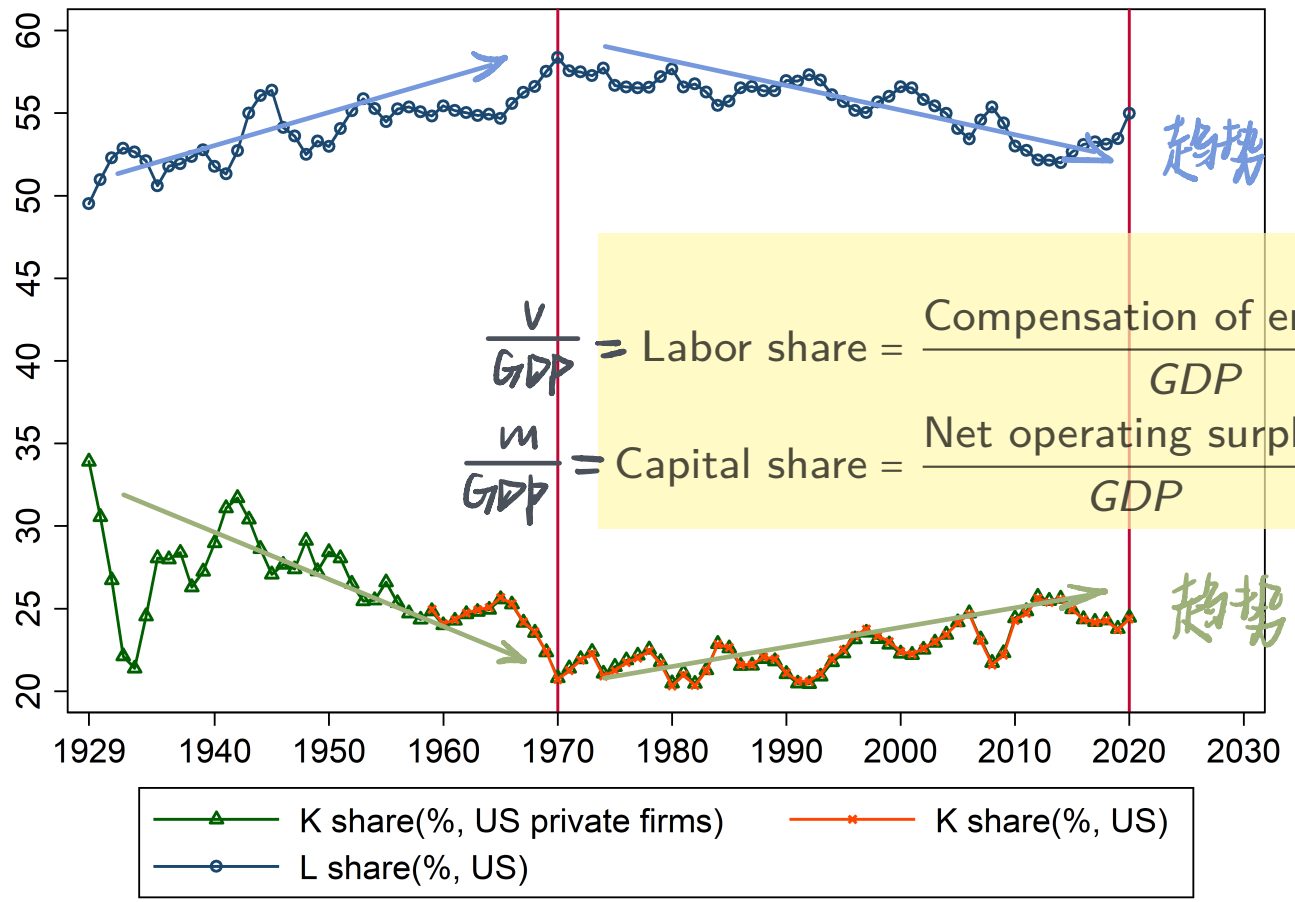
$$= \tilde{I} + CA.$$

Example 1 (Labor Share) 劳动贡献

搜索美国的收入法 GDP 数据 (Table 1.10. Gross Domestic Income by Type of Income)，根据以下公式计算资本和劳动的收入占 GDP 的份额，以及剩余价值率。你是否能看出“趋势”？

GDP= 劳动收入 (v) + 营业剩余和生产税净额 (m) + 折旧 (c 的一部分).

GDP = c + v + m



$$\frac{v}{GDP} = \text{Labor share} = \frac{\text{Compensation of employees}}{GDP} \times 100\%.$$

$$\frac{m}{GDP} = \text{Capital share} = \frac{\text{Net operating surplus}}{GDP} \times 100\%.$$

白重恩、钱震杰：Labor Share 为何大幅下降

Fig. 2. The labor share under different definitions.

白重恩、钱震杰：Labor Share 为何大幅下降

According to the NBS, there have been two changes relevant to GDP by income approach since 2004.

(1) The first change pertains to the agriculture sector. Before 2004, operating surplus in agriculture included profits of the state-owned and collective-owned farms. Because it is difficult to obtain the financial statements of state-owned and collective-owned farms, the NBS decided to count all the income excluding depreciation and net production tax in those farms as "labor compensation" since 2004. As a result of this change, over half of the provinces in China reported zero or close to zero operating surplus in agriculture in 2004. (A sudden increase in the labor share in agriculture)↑

(2) The second change is relevant to the mixed income of the owners of individual economy, the self-employed in the non-agriculture sectors. In individual economy, the self-employed owners earn "mixed-income" and the employees hired by them earn "wages." Prior to 2004, the income of both owners and employees in the individual economy was counted as labor compensation according to China's National Accounts 2002. Since 2004, the income of the employees remains included in "labor compensation" but the income of owners is considered as "operating surplus". (An abrupt decline in the labor share in non-agriculture sectors)↓

Bai, Chong-En and Zhenjie Qian. 2010. "The Factor Income Distribution in China: 1978–2007." China Economic Review, 21(4), 650-70.

白重恩、钱震杰：Labor Share 为何大幅下降

Table 2
Aggregate and sectoral labor share by sector, and various adjustments.
Source: NBS (2007a) and Author's calculations, see text for details.

	Aggregate	Agriculture	Industry	Construction	Service
(1) 2003: official	0.5362	0.8607	0.4444	0.6810	0.4900
(2) 2004: official	0.4837↓	0.9222↑	0.3823↓	0.5975↓	0.4098↓
(3) 2004: adjustment 1	0.4757	0.8654	0.3823	0.5975	0.4098
(4) 2004: adjustment 2	0.5547	0.9222	0.4221	0.6253	0.5411
(5) 2004: adjustment 3	0.5466	0.8654	0.4221	0.6253	0.5411

Notes: Adjustment 1 count operating surplus of state-owned and collective-owned farms as operating surplus (item (3) in Fig. 3); Adjustment 2 count the mixed income of individual owners as labor compensation (item (1) in Fig. 3); Adjustment 3 combine adjustment 1 and 2.

Because the non-agriculture sectors take much larger proportion in the economy than the agriculture, the aggregate labor share, which is the weighted average of each sector's labor share, appears to be much lower in 2004 than in 2003. As a result, the changes in the accounting method in GDP by income approach overestimate the decline of aggregate labor share between 2003 and 2004.

白重恩、钱震杰：Labor Share 为何大幅下降

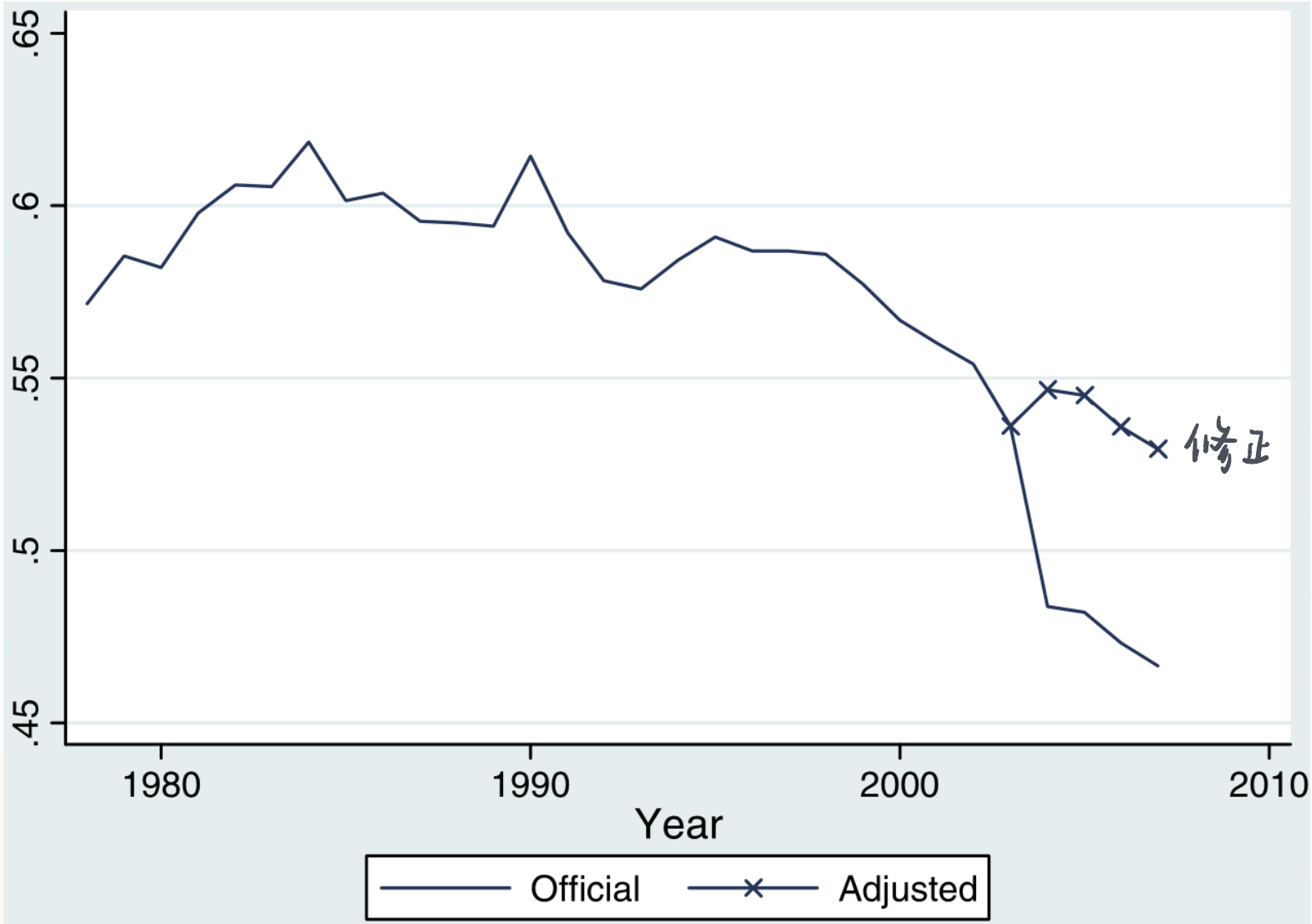


Fig. 4. The labor share in GDP net of indirect tax: official vs. adjusted.

杰科布曾为1815年做过如下的计算[99]，他假定每夸特小麦的价格是80先令，每英亩平均收小麦22蒲式耳，所以从每英亩得到的是11镑。这个计算预先把不同的项目互相抵销了，因而很不完备，但对我们来说已经足够用了。

每英亩的价值生产

种子(小麦)	1镑 9先令	什一税、地方税和国税	1镑 1先令
肥料	2镑 10先令	地租	1镑 8先令
工资	3镑 10先令	租地农场主的利润和利息	1镑 2先令
总计	7镑 9先令	总计	3镑11先令

在这里（我们始终假定产品的价格＝它的价值），剩余价值是分为利润、利息、什一税等等不同项目的。这些项目与我们无关。

(31) 第2版注：第一版所举的1860年一家纺纱厂的例子，有些事实上的错误。本文列举的材料非常精确，它是曼彻斯特的一位工厂主向我提供的。这里要指出一点，英国的旧马力是根据汽缸的直径计算的，而新马力则是根据示功器指示的实际马力计算的。

我们把它们加在一起，就得到剩余价值3镑11先令。我们把买种子和肥料的3镑19先令作为不变资本部分，使它等于零。预付的可变资本就是3镑10先令，代替它而被生产出来的新价值是3镑10先令＋3镑11先令。这样，$\frac{m}{v}=\frac{3\text{镑}11\text{先令}}{3\text{镑}10\text{先令}}$，在100%以上。工人用他的工作日的一半以上生产剩余价值，这些剩余价值被各种人用各种借口瓜分掉。(31a)

不变资本 $c = 3 + 19/20 = 3.95$ 镑，
可变资本 $v = 3 + 10/20 = 3.50$ 镑，
剩余价值 $m = 3 + 11/20 = 3.55$ 镑。

马克思计算的剩余价值率:

$$\frac{m}{v} = \frac{3.55}{3.50} \approx 1.0143$$

利润率:

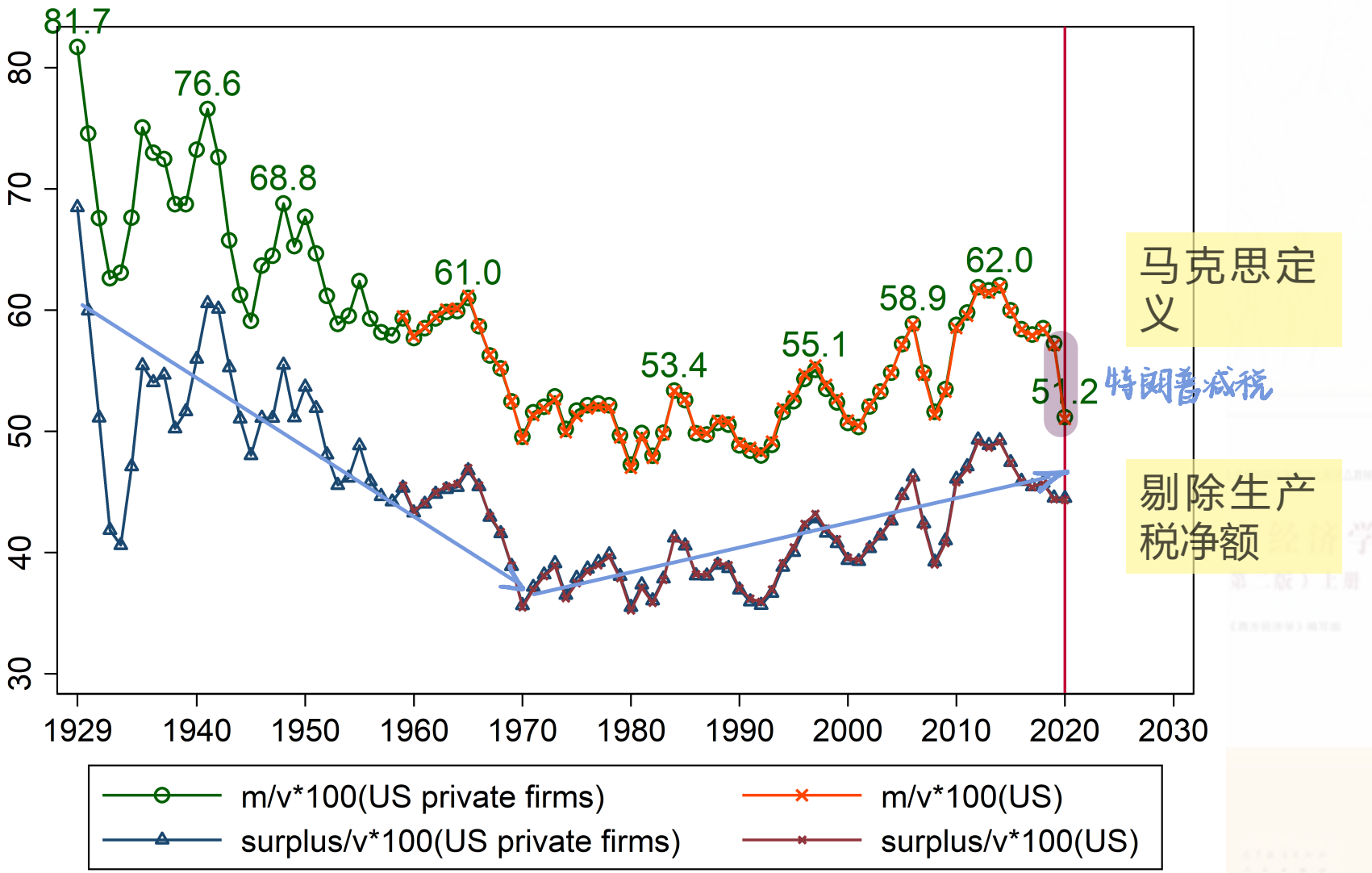
$$p' = \frac{m}{c+v} = \frac{3.55}{3.95+3.50} \approx 0.4765$$

资料来源:《资本论》第一卷, p.246–247. 人民出版社，1975 版。

1929 年以来的美国剩余价值率

GDP= 劳动收入 (v) + 营业剩余和生产税净额 (m) + 折旧 (c 的一部分).

The rate of surplus value=m/v.



阳澄湖大闸蟹礼券 1088型

类别：御品4对装（4对装）

原价: **1088元**　　折扣价: **580元**

雄蟹 3.5两 4只　　雌蟹 2.5两 4只　　4对

已销售: 1100件

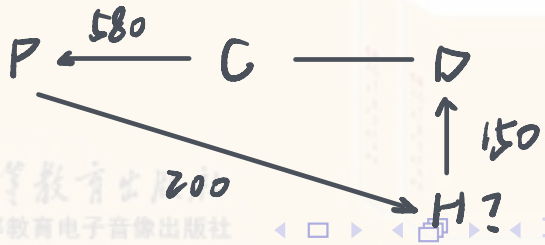
现价: **580元** /盒

订购数量: 1　　立即购买

Example 2 (实体资产证券化)

每年九月下旬，阳澄湖大闸蟹开湖。由于活蟹难以储存，经销商发明了大闸蟹提货券方便中秋送礼。假设经销商 P 印刷 1088 元面额的螃蟹券 (印刷成本忽略不计)，以 580 元价格卖给消费者 C。消费者 C 将螃蟹券送给领导 D。D 转手以 150 元价格将螃蟹券卖给了黄牛 H。经销商按照 200 元价格向市场黄牛回收螃蟹券。一只螃蟹没卖，但经销商赚了 380 元，领导赚了 150 元，黄牛赚了 50 元。(详见凤凰评论、央视网报导)

问：整个过程为 GDP 贡献多少价值?



Example 3 (黑社会经济学)

未被计入GDP

国家政府的实质
何尝不是一种"保险"?

根据下列材料回答：黑社会向路边小摊收保护费，对 GDP 核算有何影响?

新浪网报道(2016-2-23)，农历年初二的旺角暴乱，交了保护费的小贩损失惨重。黑社会老大在暴乱后按照“合约精神”赔偿排挡摊贩的损失，显示他们“盗亦有道”。

一家位于旺角通菜街（俗称女人街）的排档当晚被人恶意纵火，一车帆布被烧，摊主损失超过 1 万元（港元，下同，约 1800 新元)。一名黑帮老大在暴乱后年初二当天到现场向该排挡摊主“拜年”并派发红包，也提供近两万元的赔偿。

黑社会势力在旺角的分布复杂，各方势力分别向那里的排档及小型巴士收取保护费及“入线费”。因此，黑社会成员于暴乱发生时，就在一旁监视本土极端派暴徒与警察的冲突，以确保他们所“保护”的排档及小型巴士不会被损毁。

本土极端派暴徒也对黑社会有所忌惮，不敢招惹他们。据一名黑社会老大说，他当天曾派手下带着一袋武器到现场，袋中有几十把用于阻吓暴徒的牛肉刀，暴徒因此不敢烧毁受黑社会保护的小型巴士。

《亚洲周刊》报道，香港警方的西九龙反黑组在农历新年前，要求各区老大在新年期间管束好手下，不要作恶捣乱。在严重冲突发生前，西九龙反黑组又联系各区老大约束手下不参与暴乱。因此，当晚有老大下达“死命令”，要求手下不被政治所利用，在暴乱中“两不相帮”；也不准任何人破坏小巴站，因为这是他们的主要收入来源。

延伸阅读：Olson, Mancur. (1993). Dictatorship, Democracy, and Development. The American Political Science Review, 87(3), 567-576.

（三）商品是使用价值和价值的统一

商品具有使用价值和价值这两个因素或二重属性，是使用价值和价值的统一。一个物可以有使用价值但不含有价值，有使用价值是由于其自然属性，但它并不是人的劳动的产物。例如，空气、天然草地、野生林等。一个物可以有用，而且是人类劳动产品，但不是商品，耗费在其中的劳动不形成价值。比如人们用自己生产的产品来满足自己的需要或无偿地提供给他人消费，这种产品就只有使用价值，但不是商品。要生产商品，不仅要生产使用价值，而且要为别人生产使用价值，即生产社会化性质的使用价值，并且产品必须通过交换，转到把它当作使用价值使用的人手里。一个物如果没有使用价值，就是无用之物，即使人们为它付出了劳动，也不形成价值。

商品的使用价值与价值之间又存在着矛盾。对于商品生产者而言，他生产某种商品并不是为了取得这种商品的使用价值，而是为了取得它的价值。而要取得这种商品的价值，他就必须将商品的使用价值让渡给商品购买者。反过来说，商品的购买者要获得商品的使用价值，就必须支付商品的价值。在交换过程中，使用价值和价值进行着相反的运动。可见，正是因为存在着使用价值与价值之间的对立或矛盾，才产生了商品交换。也只有通过交换，商品内在的使用价值与价值之间的矛盾才能得到解决。而一旦交换失败，商品价值不能实现，使用价值不能进入消费，商品的内在矛盾就不能得到解决，商品生产者则会陷入困境。

Example 4

阅读马工程教材《马克思主义政治经济学概论》(2021, p.39) 关于商品的价值 (value) 和使用价值 (use-value) 的论述。

问：GDP 核算对象是价值还是使用价值?

Example 5

观看黄渤电影《一出好戏》。假设所有交易都公开。孤岛上，马进和小兴面临饿死的绝境。一天，从天而降一大群鱼，拯救了马进和小兴。两人用天降之鱼交换到孤岛上的绝大多数物品。

(a) 天降之鱼是否有使用价值? 有

(b) 天降之鱼是否有价值? 有

(c) 天降之鱼是否计入孤岛的 GDP? 计

Example 6

三驾马车，是否为 GDP 增长的动力? $Y = C + I + G + NX$ 恒等式

Example 7

有没有神奇方法创造 GDP?

Outline

疑难重点

(1) 掌握 GDP 的概念，理解经济的资金环流图 (The circular flow of funds)。解题时如何运用此图?

(2) 掌握 GDP 核算的三种方法：生产法、支出法、收入法。在具体题目中如何核算?

(3) 能够理解中国和美国的与 GDP 相关的经济统计表格。

(4) 掌握下列指标之间的关系：GDP, GNP, NNP, NDP, NI, PI, DPI, GNFI, NNFI.

(5) GDP 作为衡量经济活动的指标，有何缺陷?

(6) 掌握两个恒等式：The income-expenditure identity, the saving-investment identity.

$$Y = C + I + G + Nx \qquad S = \tilde{I} + CA$$

马工程教材疑难重点

1 (E2, p.33)

根据马工程教材观点，应当如何用马克思主义立场、观点和方法评析西方经济学?

2 (E2, p.19)

根据马工程教材观点，应当如何评析西方经济学的研究对象?

3 (E2, p.27)

根据马工程教材观点，应当如何评析西方经济学的 GDP 指标?

西方经济学

Part 1 Understanding Macroeconomic Data

Lecture 1B Other Measures

Jian LI

Department of International Economics and Trade
Nanjing University

高等教育出版社
高等教育电子音像出版社

Supplement Readings

(1) M9; S2. [1]

(2) U.S. Bureau of Labor Statistics, U.S. Department of Commerce, FRED Economic Data.

(3) 其他文献：吕捷, 王高望. CPI 与 PPI “背离” 的结构性解释 [J]. 经济研究, 2015, 50(04): 136-149.

(4) 其他文献：The Data of Macroeconomics

[1] M 指代马工程教材，S 指代课外阅读材料沈坤荣教程。

学习目标

(1) 掌握 price and quantity Indexes 的计算方法。
(2) 理解增长与贴现的概念。
(3) 掌握名义利率和实际利率的关系。
(4) 从贴现角度理解资产定价。
(5) 掌握马工程教材精神。

观察与思考

GDP 的增长

(1) 《中华人民共和国 2022 年国民经济和社会发展统计公报》（2023 年 2 月 28 日）：“初步核算，全年国内生产总值 1210207 亿元，比上年增长 3.0%。”

(2) 2022 年《中国统计年鉴》：2021 年全国国内生产总值 1143669.7 亿元。

(3) $\text{GDP 增长率} = \dfrac{1210207 - 1143669.7}{1143669.7} \times 100\% = 5.8\%$

观察与思考

如何解决大学生失业?

(1) 国家统计局答记者问（2024 年 1 月 17 日）：全年全国城镇调查失业率平均值为 5.2%，比上年下降 0.4 个百分点。……为更加准确完整反映青年就业失业状况，从充分考虑国情的角度出发，对分年龄组失业率统计做了两方面的调整，一是发布不包括在校学生的 16-24 岁劳动力失业率；二是增加发布不包括在校学生的 25-29 岁劳动力失业率。

(2) 2022 年统计公报（2023 年 2 月 28 日）：全年全国城镇调查失业率平均值为 5.6%。年末全国城镇调查失业率为 5.5%。

(3) 人民网（2022 年 8 月 15 日）：数据显示，1-7 月份，全国城镇新增就业 783 万人。7 月份，全国城镇调查失业率为 5.4%，比上月下降 0.1 个百分点。本地户籍人口调查失业率为 5.3%；外来户籍人口调查失业率为 5.5%，其中外来农业户籍人口调查失业率为 5.1%。16-24 岁、25-59 岁人口调查失业率分别为 19.9%、4.3%。31 个大城市城镇调查失业率为 5.6%。全国企业就业人员周平均工作时间为 48.0 小时。

(4) 经济观察网（2022 年 1 月）：那些倔强着“躺平”的年轻人滑出失业统计。

(5) 北大教授建议（2023 年 2 月）：应当对失业者征收失业税，要让他们明白躺平是需要付出代价的，与其抱怨生活的不易，还不如找到一份工作，不要在乎钱多钱少，只要好好干，生活一定会越来越甜！

观察与思考

从经济学角度如何理解“女子无才便是德”？

(1) “哲夫成城，哲婦傾城。” ——《诗经・大雅・瞻卬》

(2) “男子有德便是才，女子無才便是德。” ——明・陳繼儒（1558-1639）《安得長者言》

(3) “女子無才便是德，莫因斯語廢文章。家貧賸汝無金玉，只有詩書作嫁妝。” ——《清代閨閣詩集萃編・天游閣集・詩六》

Outline

Quantity Indexes 数量指数

Let year 0 be the base year. A **Laspeyres quantity index** 拉氏指数 for year t is defined as

$$QI^L_{t,0} = \frac{\sum_i P_{i0} Q_{it}}{\sum_i P_{i0} Q_{i0}} \times 100 = \sum_i \left(\frac{P_{i0} Q_{i0}}{\sum_i P_{i0} Q_{i0}} \right) \frac{Q_{it}}{Q_{i0}} \times 100.$$

A **Paasche quantity index** 帕氏指数 for year t is defined as

$$QI^P_{t,0} = \frac{\sum_i P_{it} Q_{it}}{\sum_i P_{it} Q_{i0}} \times 100 = \sum_i \left(\frac{P_{it} Q_{i0}}{\sum_i P_{it} Q_{i0}} \right) \frac{Q_{it}}{Q_{i0}} \times 100.$$

Laspeyres Quantity Index

3-5　国内生产总值指数

本表按不变价格计算。

(1978年=100)

年 份	国 民 总收入 GDI	国内生产 总 值 GDP*	人均国内 生产总值	人均国民 总收入
1978	100.0	100.0	100.0	100.0
1979	107.6	107.6	106.2	106.2
1980	116.0	116.0	113.1	
1981	121.9	122.0	117.3	
1982	133.1	132.9	126.0	
1983	147.8	147.3	137.6	
1984	170.5	169.6	156.4	
1985	192.9	192.4	175.1	

"国内生产总值指数"指 Laspeyres quantity index。1978 年 =100 指 base year=1978。上年 =100 指 base year=$t-1$。$\sum_i P_{i0}Q_{it}$ is called the constant-price real GDP. 不变价国内生产总值

3-4　国内生产总值指数

本表按不变价格计算。

(上年=100)

年 份	国 民 总收入	国内生产 总 值	人 生	
1978	111.7	111.7		
1979	107.6	107.6		
1980	107.8	107.8		
1981	105.1	105.1		
1982	109.2	109.0		
1983	111.0	110.8	109.2	109.5
1984	115.3	115.2	113.7	113.8
1985	113.2	113.4	111.9	111.7

3-3　不变价国内生产总值

单位：亿元

年 份	国内生产 总 值
	按1970年价格计算
1978	3593.0
1979	3865.8
1980	4168.6
	按1980年价格计算
1980	4587.6
1981	4822.1
1982	5257.0
1983	5823.1
1984	6707.8
1985	7608.7

Quantity Indexes: Chain-Weighted

费雪物量指数

A **Fisher quantity index** for a pair of periods, $(t-1, t)$, is defined as

$$QI^F_{t,t-1} = \sqrt{QI^L_{t,t-1} \times QI^P_{t,t-1}}$$

L、P 的几何平均

Let year 0 be the reference year. The **chain-type** quantity index for year t is calculated as follows.

链式物量指数

$$QI^F_{t,0} = \frac{QI^F_{t,t-1}}{100} \times \frac{QI^F_{t-1,t-2}}{100} \times \frac{QI^F_{t-2,t-3}}{100} \times \cdots \times \frac{QI^F_{2,1}}{100} \times \frac{QI^F_{1,0}}{100} \times 100.$$

$$QI^F_{t,0} = 100 \sum_{i=0}^{t-1} \frac{QI^F_{i+1,i}}{100} = 100 \sum_{i=0}^{t-1} \frac{\sqrt{QI^L_{i+1,i} \cdot QI^P_{i+1,i}}}{100}$$

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Table 1.1.3. Real Gross Domestic Product, Quantity Indexes

[Index numbers, 2012=100]

Last Revised on: September 30, 2021 - Next Release Date October 28, 2021

$QI^F_{t,2012}$

Line		2010	2011	2012	2013	2014	2015
Line							
1	**Gross domestic product** GDP	**96.278**	**97.770**	**100.000**	**101.842**	**104.172**	**106.991**
2	**Personal consumption expenditures**	**97.001**	**98.651**	**100.000**	**101.488**	**104.236**	**107.654**
3	Goods	95.821	97.913	100.000	103.147	107.351	112.457
4	Durable goods	89.783	94.359	100.000	106.106	113.751	122.409
5	Nondurable goods	98.707	99.575	100.000	101.803	104.482	108.029
6	Services	97.581	99.015	100.000	100.684	102.748	105.400
7	**Gross private domestic investment**	**84.542**	**90.097**	**100.000**	**106.855**	**112.871**	**119.071**
8	Fixed investment	84.852	90.875	100.000	105.551	112.494	116.798
9	Nonresidential	84.068	91.354	100.000	104.127	111.649	114.247
10	Structures	86.098	88.465	100.000	101.256	112.390	111.408
11	Equipment	79.434	90.113	100.000	104.662	111.968	115.371
12	Intellectual property products	89.697	95.282	100.000	105.440	110.533	114.747
13	Residential	88.660	88.532	100.000	112.369	116.688	128.567
14	Change in private inventories	---	---	---	---	---	---
15	**Net exports of goods and services**	**---**	**---**	**---**	**---**	**---**	**---**
16	Exports	89.712	96.141	100.000	102.971	106.970	107.260
17	Goods	89.529	96.202	100.000	102.940	107.526	107.146
18	Services	90.118	96.005	100.000	103.041	105.790	107.427
19	Imports	93.126	97.610	100.000	101.213	106.436	111.956
20	Goods	92.325	97.418	100.000	102.007	107.686	113.915
21	Services	96.937	98.540	100.000	97.457	100.596	103.062
22	**Government consumption expenditures and gross investment**	**105.469**	**102.113**	**100.000**	**97.585**	**96.708**	**98.466**

In the NIPAs, the annual changes in quantities and prices are calculated using a Fisher formula that incorporates weights from 2 adjacent years. For example, the 2014–2015 change in real GDP uses prices for 2014 and 2015 as weights, and the 2014–2015 change in prices uses quantities for 2014 and 2015 as weights. These annual changes are "chained" (multiplied) together to form time series of quantity and price indexes.

from "Estimates for NIPA aggregates", Chapter 4, NIPA Handbook

Table 1.1.6. Real Gross Domestic Product, Chained Dollars

[Billions of chained (2012) dollars]
Last Revised on: September 30, 2021 - Next Release Date October 28, 2021

$RGDP^F_{t,2012}$

Line		2010	2011	2012	2013	2014	2015
Line							
1	**Gross domestic product**	**15,649.0**	**15,891.5**	**16,254.0**	**16,553.3**	**16,932.1**	**17,390.3**
2	**Personal consumption expenditures**	**10,716.0**	**10,898.3**	**11,047.4**	**11,211.7**	**11,515.3**	**11,892.9**
3	Goods	3,485.7	3,561.8	3,637.7			
4	Durable goods	1,027.3	1,079.7	1,144.2			
5	Nondurable goods	2,461.3	2,482.9	2,493.5			
6	Services	7,230.4	7,336.7	7,409.6			
7	**Gross private domestic investment**	**2,216.5**	**2,362.1**	**2,621.8**			
8	Fixed investment	2,164.2	2,317.8	2,550.5			
9	Nonresidential	1,781.0	1,935.4	2,118.5			
10	Structures	412.8	424.1	479.4			
11	Equipment	781.2	886.2	983.4			
12	Intellectual property products	588.1	624.8	655.7			
13	Residential	383.0	382.5	432.0			
14	Change in private inventories	57.3	46.7	71.2			
15	**Net exports of goods and services**	**-589.4**	**-571.0**	**-551.6**			
16	Exports	1,989.5	2,132.1	2,217.7			
17	Goods	1,369.4	1,471.5	1,529.6			
18	Services	620.1	660.6	688.1			
19	Imports	2,578.9	2,703.1	2,769.3			
20	Goods	2,117.3	2,234.1	2,293.3			
21	Services	461.5	469.1	476.1			
22	**Government consumption expenditures and gross investment**	**3,308.0**	**3,202.7**	**3,136.5**			
23	Federal	1,348.4	1,312.0	1,287.0			
24	National defense	861.3	842.9	814.2			
25	Nondefense	487.0	469.1	472.8			
26	State and local	1,959.8	1,890.8	1,849.5	1,844.4	1,847.6	1,902.2
27	Residual 残差	-11.3	-3.7	0.0	-0.3	0.6	10.7

The chain-weighted real GDP or the chained real GDP for year t is given by

$$RGDP^F_{t,0} = \left(\sum_i P_{i0} Q_{i0}\right) \times \frac{QI^F_{t,0}}{100}.$$

Because the formula for the chain-type quantity indexes uses weights of more than one period, the corresponding chained-dollar estimates are usually **not additive**. The residual line is the difference between the first line and the sum of the most detailed lines.

Outline

Price Indexes 价格指数

Let year 0 be the base year. A **Laspeyres price index** for year t is defined as

$$PI^L_{t,0} = \frac{\sum_i P_{it} Q_{i0}}{\sum_i P_{i0} Q_{i0}} \times 100.$$

A **Paasche price index** for year t is defined as

$$PI^P_{t,0} = \frac{\sum_i P_{it} Q_{it}}{\sum_i P_{i0} Q_{it}} \times 100.$$

CPI and PPI

The **consumer price index (CPI)** is a measure of the average current level of prices of consumer goods and services purchased by households in an economy relative to the one in the reference year. The market basket for calculating CPI is called the consumption basket. CPI excluding food and energy is called the core CPI. The rate of inflation implied by the core CPI is called **the core rate of inflation**. (see CPI in BLS)

The **producer price index (PPI)** is a measure of the average current level of selling prices received by domestic producers of goods and services in an economy relative to the one in the reference year. (see PPI in BLS)

Both the CPI and the PPI are Laspeyres Indexes. But the CPI updates weights every 2 years while the PPI updates weights every 5 years (in USA).

Price Indexes: Chain-Weighted

A **Fisher price index** for a pair of adjacent years, $(t-1, t)$, is defined as

$$PI^F_{t,t-1} = \sqrt{PI^L_{t,t-1} \times PI^P_{t,t-1}}.$$

Let year 0 be the reference year. The **chain-type** price index for year t is calculated as follows.

$$PI^F_{t,0} = \frac{PI^F_{t,t-1}}{100} \times \frac{PI^F_{t-1,t-2}}{100} \times \frac{PI^F_{t-2,t-3}}{100} \times \cdots \times \frac{PI^F_{2,1}}{100} \times \frac{PI^F_{1,0}}{100} \times 100.$$

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Table 1.1.4. Price Indexes for Gross Domestic Product

[Index numbers, 2012=100]

Last Revised on: September 30, 2021 - Next Release Date October 28, 2021

$PI^F_{t,2012}$

Line		2010	2011	2012	2013	2014	2015
Line							
1	**Gross domestic product**	**96.164**	**98.157**	**100.000**	**101.769**	**103.662**	**104.662**
2	**Personal consumption expenditures**	**95.747**	**98.170**	**100.000**	**101.354**	**102.887**	**103.116**
3	Goods	95.183	98.773	100.000	99.407	98.920	95.896
4	Durable goods	102.107	101.280	100.000	97.968	95.429	93.358
5	Nondurable goods	92.182	97.652	100.000	100.082	100.599	97.092
6	Services	96.017	97.875	100.000	102.322	104.880	106.796
7	**Gross private domestic investment**	**97.687**	**98.704**	**100.000**	**100.979**	**102.922**	**103.535**
8	Fixed investment	97.568	98.641	100.000	101.091	103.172	104.075
9	Nonresidential	97.416	98.559	100.000	100.251	101.469	101.909
10	Structures	92.006	95.362	100.000	101.455	107.198	109.403
11	Equipment	99.471	99.447	100.000	99.787	99.169	98.671
12	Intellectual property products	98.306	99.517	100.000	100.081	100.791	101.374
13	Residential	98.317	99.049	100.000	105.054	111.118	114.114
14	Change in private inventories	---	---	---	---	---	---
15	**Net exports of goods and services**	**---**	**---**	**---**	**---**	**---**	**---**
16	Exports	93.350	99.237	100.000	100.148	100.216	95.373
17	Goods	92.952	99.793	100.000	99.320	98.312	91.323
18	Services	94.230	98.001	100.000	101.987	104.466	104.431
19	Imports	92.655	99.716	100.000	98.697	97.961	90.144
20	Goods	91.960	99.868	100.000	98.059	96.752	87.644
21	Services	95.891	98.987	100.000	101.841	104.018	102.981
22	**Government consumption expenditures and gross investment**	**95.391**	**98.289**	**100.000**	**102.363**	**104.470**	**104.638**

How to deflate a nominal variable

名义变化

Nominal variables are affected by the change in both quantity and price. Filtering out the effect of inflation, we obtain deflated or real variable.

$$\text{GDP Deflator}_{t,0} = \frac{\text{Nominal GDP}_t}{\text{Real GDP}_{t,0}} \times 100.$$

GDP平减指数

Real GDP can be constant-price GDP or chain-weighted real GDP.

$$\textbf{Deflated Variable}_{t,0} = \frac{\text{Nominal Variable}_t}{\text{Approapriate Price Index}_{t,0}/100}.$$

CPI / PPI

实际指标 = 名义指标 / 价格指数

PCE Deflator

CPI与PCE区别
1. PCE范围更大：包括为雇主、政府提供的商品和服务
2. CPI用拉氏计算，PCE用费雪计算

个人消费指数

Personal consumption expenditures (PCE) deflator is a measure of the overall level of prices that shows the cost of the currently consumed basket of goods relative to the cost of that basket in a base year.

$$\text{PCE Deflator}_{t,0} = \frac{\text{Nominal Personal Consumption Expenditures}_t}{\text{Real Personal Consumption Expenditures}_{t,0}} \times 100.$$

(1) Like the CPI, the PCE deflator includes only the prices of goods and services that consumers buy; it excludes the prices of goods and services that are part of investment spending and government purchases.

(2) Also like the CPI, the PCE deflator includes the prices of imported goods.

(3) But like the GDP deflator, the PCE deflator allows the basket of goods to change over time as the composition of consumer spending changes.

Inflation Rates

An **inflation rate** (π) is the growth rate of a price index given the reference year 0.

$$\pi_t = \left(\frac{\text{Price Index}_{t,0}}{\text{Price Index}_{t-1,0}} - 1 \right) \times 100\%$$

The price index can be GDP deflator, CPI, or PPI. Which one you choose depends on the purpose. The growth rates of GDP deflator, CPI and PPI measure the average price changes from the perspective of overall economy, the consumer, and the seller, respectively. Sellers' and purchasers' prices may differ due to government subsidies, sales and excise taxes, and distribution costs.

Outline

Measuring Joblessness

Employment (N) is the number of people who have a job.
Unemployment (U) is the number of people who do not have a job but are looking for one. The **labor force** (L) is the sum of employment and unemployment.

$$L = N + U$$

$$\text{Unemployment Rate}(u) = \frac{\text{Unemployment}(U)}{\text{Labor Force}(L)} \times 100\%$$

失业率

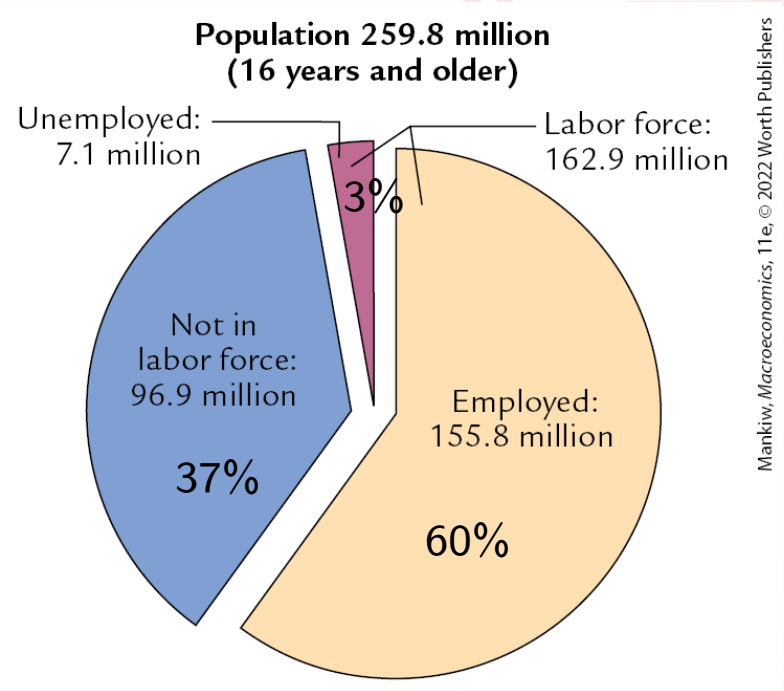
$$\text{Participation Rate} = \frac{\text{Labor Force}(L)}{\text{Total Working Age Population}} \times 100\%$$

劳动力参与率

$$\text{Employment/Population ratio} = \frac{\text{Employment}(N)}{\text{Total Working Age Population}} \times 100\%$$

人口雇佣率

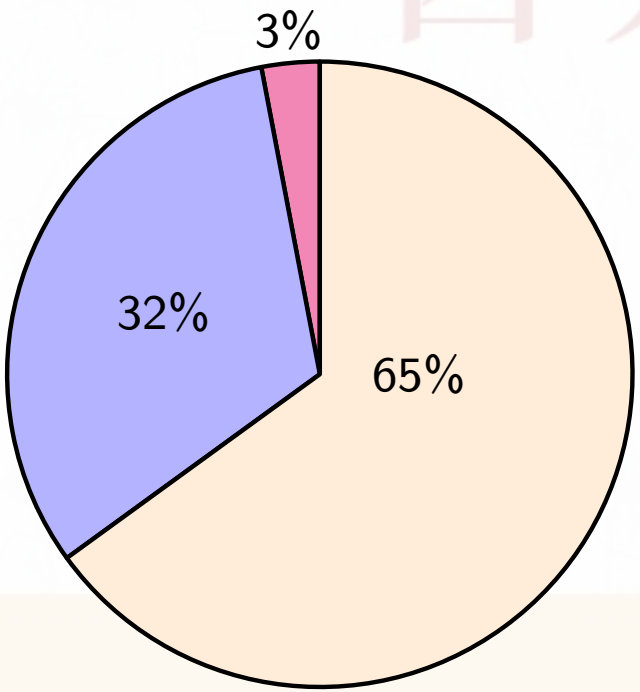
Measuring Joblessness in USA (2020)



The Three Groups of the Population. When the Bureau of Labor Statistics surveys the population, it places all adults into one of three categories: employed, unemployed, or not in the labor force. This figure shows the number of people in each category in March 2020.

Measuring Joblessness in China (2020)

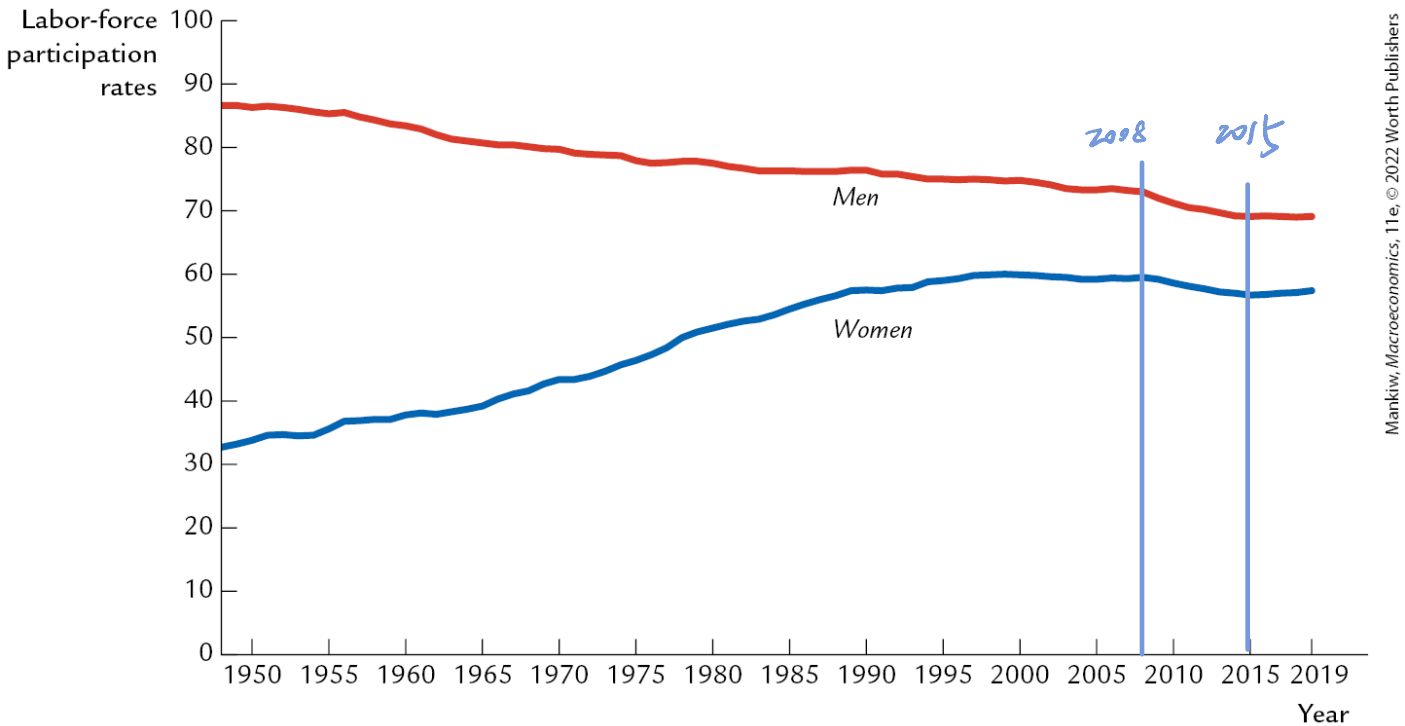
Population 1159.3 million
(15 years and older)



Labor Force: 783.9 million

- Unemployed:33.3 million
- Not in Labor Force:375.4 million
- Employed:750.6 million

Trends in Labor-Force Participation



Just after World War II, men and women had very different economic roles. Only 34 percent of women were working or looking for work, compared with 86 percent of men. Since then, the difference between the participation rates of men and women has gradually diminished, as growing numbers of women have entered the labor force and some men have left it. Data for 2019 show that more than 57 percent of women were in the labor force, compared with 69 percent of men. As measured by labor-force participation, men and women are now playing more equal roles in the economy.

Measuring Joblessness

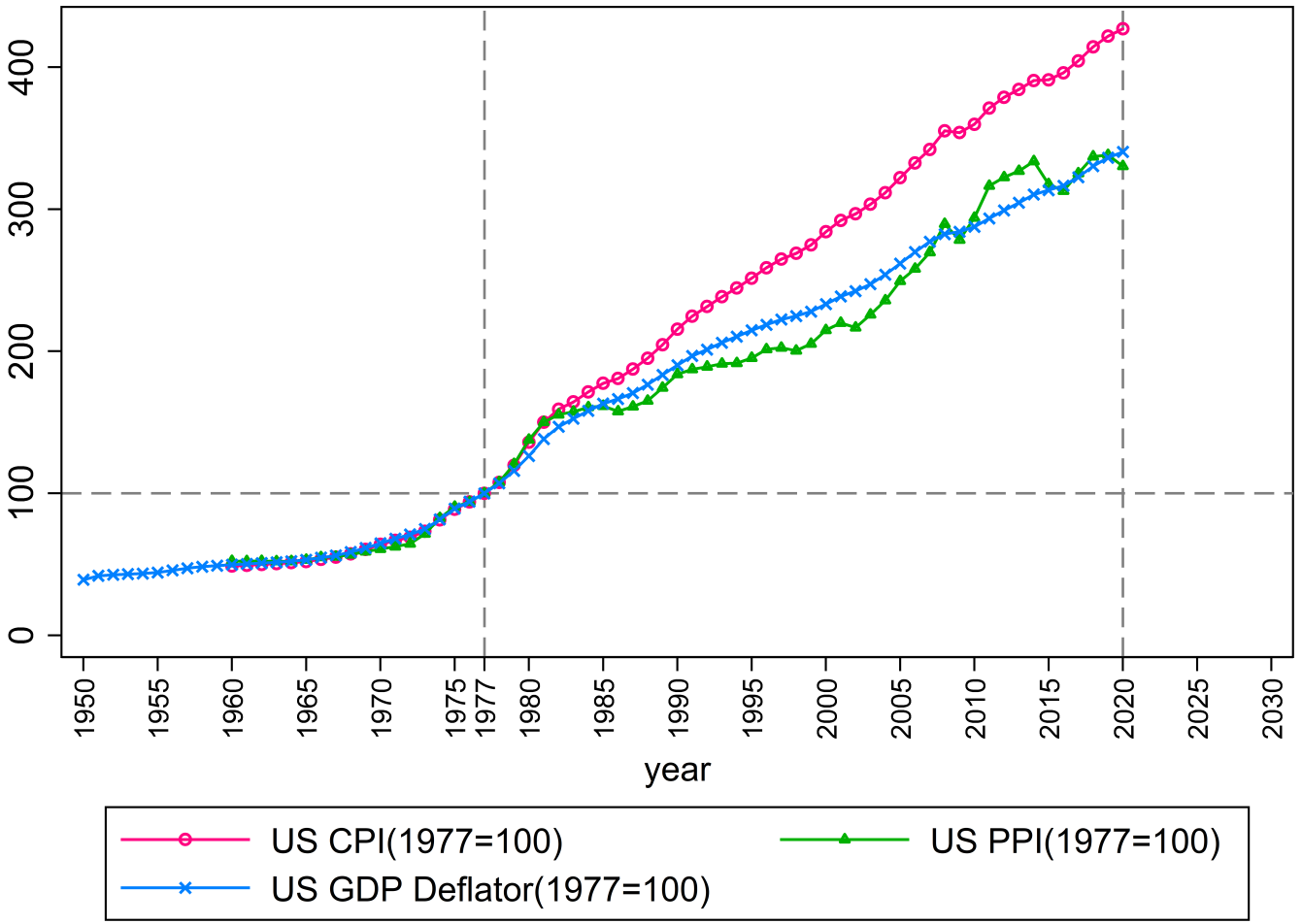
马工程观点 (M, 2011, p.199)

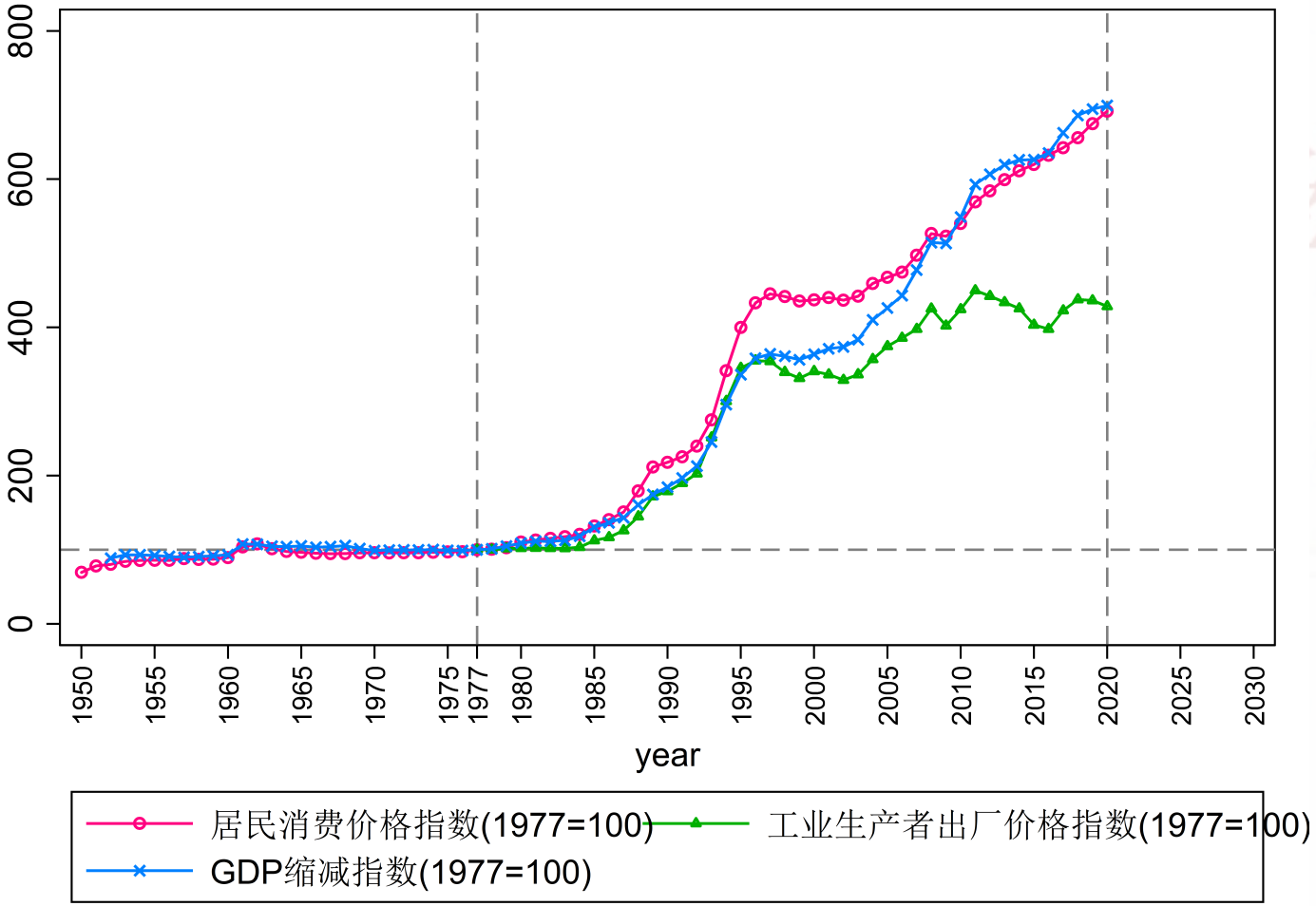
（1）失业的界定问题。失业率是评价一个国家或地区失业状况的主要指标。要计算失业率就必须界定失业。在我国计划经济时期，失业表现为隐性失业，没有对失业作严格的界定。改革开放以后，我们对失业的界定也相对模糊。目前，我国城镇登记失业率的计算是，城镇登记失业人员与城镇单位就业人员（扣除使用的农村劳动力、聘用的离退休人员、港澳台及外方人员）、城镇单位中的不在岗职工、城镇私营业主和个体户主、城镇私营企业和个体就业人员、城镇登记失业人员之和的比。③ 与国际通用的失业统计定义相比，我国对失业的定义与登记涵盖面偏小，现行的失业统计指标只能反映显性失业状况，无法反映隐性失业问题。因此，我国可以借鉴发达国家的失业统计经验，完善我国的失业统计工作，使失业率指标真正发挥宏观经济的风向标作用。

Outline

Example 1

Does CPI overstate the cost of living? Does GDP deflator understate it? Why?




800
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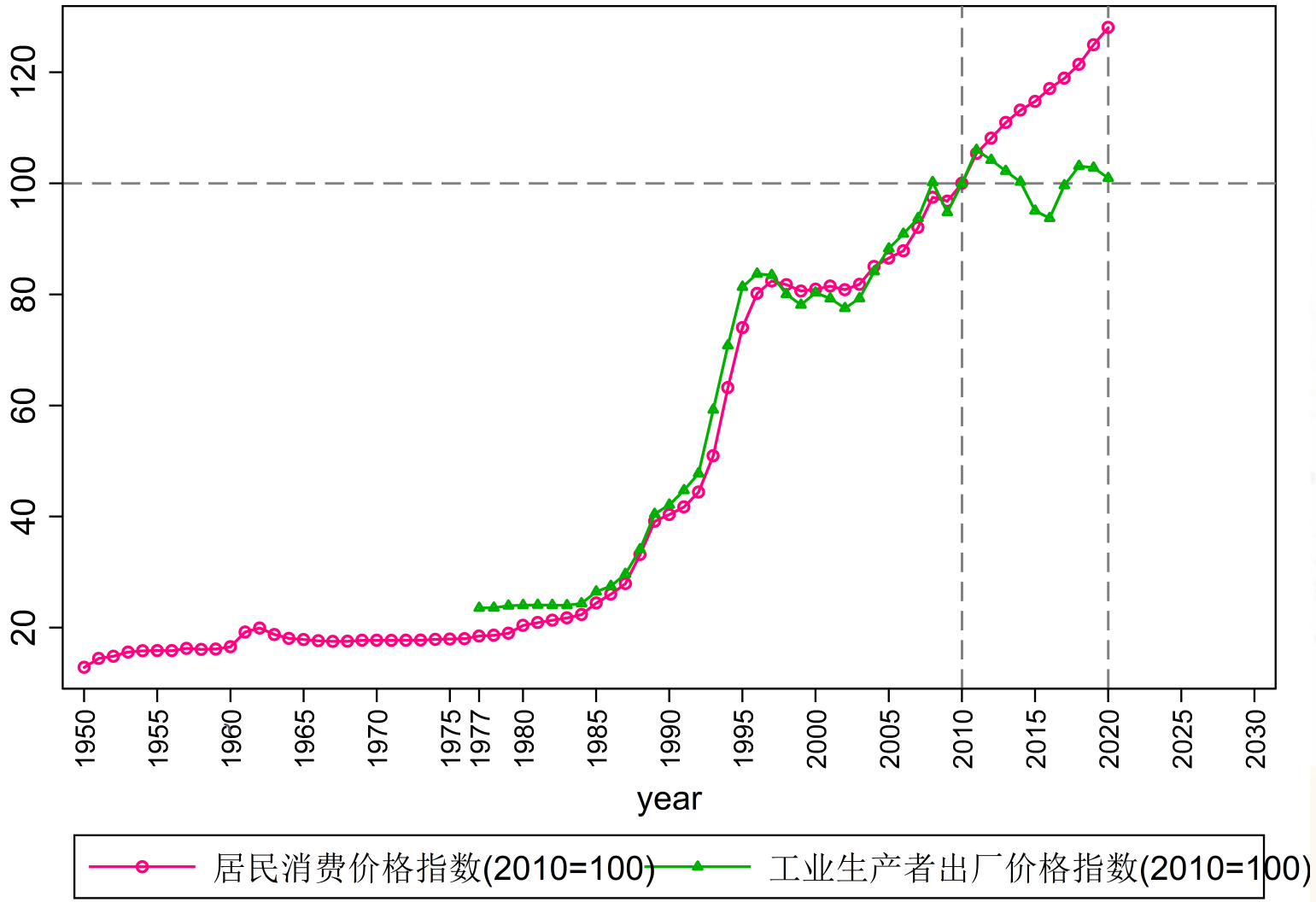
year
居民消费价格指数(1977=100)
工业生产者出厂价格指数(1977=100)
GDP缩减指数(1977=100)

Example 2 (吕捷、王高望, 2015, 经济研究, April)

Why is there divergence between CPI and PPI?



CPI 与 PPI“背离”的结构性解释*

吕　捷　王高望

内容提要:2000 年以来中国的两大物价指数 CPI、PPI 出现了多次“背离”式增长。尤其是最近三年(2011—2013),CPI 持续上涨而 PPI 连续下跌,这使得中央银行运用货币政策稳定物价水平的能力受到了极大限制。本文通过构建三部门动态随机一般均衡模型(Three-Sector DSGE),探讨了 CPI 与 PPI 背离的结构性原因。研究发现,央行采用的宽松货币政策一方面导致劳动力不断从基础农业部门流向加工服务部门,推动了加工服务部门的扩张和基础农业部门的收缩;另一方面使得 CPI 不断上涨而 PPI 在经历一个短期的上升以后开始不断下降,从而出现了 CPI 与 PPI 的阶段性“背离”。本文不仅较好地解释了 CPI 和 PPI 背离的结构性原因,同时也为央行制定更为有效的货币政策提供了一个新的视角。

关键词:CPI 与 PPI 背离　货币政策　三部门模型　DSGE

Outline

Growth

Proposition 1

本金 固定收益证券

Let P denote the principal of a fixed-income investment made at the end of year 0. Let r be the constant annual interest rate. By simple interest, the value of investment at the end of year t is given by 年利率

$$(*) \quad V_S(t) = P(1+rt). \quad \text{(单利)}$$

By compound interest, if the interest is to compound annually, then the value of investment at the end of year t is $V_C^1(t) = P(1+r)^t$. If it is to compound n times per year, then the value is $V_C^n(t) = P\left(1+\frac{r}{n}\right)^{nt}$. If it is compounded continuously,

$$(*) \quad V_C(t) = \lim_{n\to\infty} P\left(1+\frac{r}{n}\right)^{\frac{n}{r}\cdot rt} = Pe^{rt}. \quad \text{(连续复利)}$$

本金 利率

A uniform formula is given by $V(t) = V(0) + \int_0^t P(s)r(s)ds$, where $P(s) = V(0)$ for simple interst case while $P(s) = V(s)$ for continuously compounding interst case.

$*$: $V(t) = V(0) + \int_0^t V(s)r(s)\,ds$

求导有 $V'(t) = V(t)\cdot r(t) \Rightarrow \frac{V'(t)}{V(t)} = r(t)$

Discount 贴现，折现

$$\frac{d\ln V(t)}{dt} = r(t) \Rightarrow \frac{d\ln V(s)}{ds} = r(s)$$

$$\int_0^t \frac{d\ln V(s)}{ds}\,ds = \int_0^t r(s)\,ds$$

$$\ln V(s)\Big|_0^t = \int_0^t r(s)\,ds \Rightarrow V(t) = V(0)\,e^{\int_0^t r(s)\,ds}$$

现值

Present value or **present discounted value** is the value on the present date of a payment or series of payments received on other dates.

Proposition 2 (Discrete-Time) 离散时间

Assume the interest rate (r) is constant. Let π_t be a cash flow received at the end of year t. If cash flows are received every year from $t = 1$ on, then the present value of ALL cash flows, $\pi_1, \pi_2, \cdots$, at the end of year 0 is

现金流

$$V(0) = \frac{\pi_1}{1+r} + \frac{\pi_2}{(1+r)^2} + \cdots$$

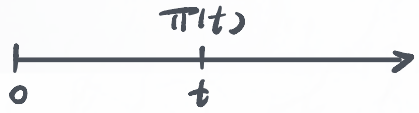
If $\pi_t = \pi$ is constant, then $V(0) = \frac{\pi}{r}$.

$$V(0) = \frac{\pi}{1+r} + \frac{\pi}{(1+r)^2} + \cdots + \frac{\pi}{(1+r)^n} \quad n\to\infty$$

$$= \frac{\pi}{1+r}\left(1 + \frac{1}{1+r} + \cdots + \frac{1}{(1+r)^{n-1}}\right)$$

$$= \frac{\pi}{1+r} \lim_{n\to\infty} \frac{1-\frac{1}{(1+r)^n}}{1-\frac{1}{1+r}} = \frac{\pi}{1+r}\cdot\frac{1}{1-\frac{1}{1+r}} = \frac{\pi}{r}.$$

Discount



$$xe^{rt} = \pi(t) \Rightarrow x = \pi(t)e^{-rt}$$

$$V(0) = \int_0^{+\infty} \pi(t)e^{-rt}\,dt$$

Proposition 3 (Continuous-Time) 连续时间

Assume the interest rate (r) is constant. Let $\pi(t)$ be an instantaneous cash flow received at time t. At time 0, the present value of cash flows, $\{\pi(t) : t \in [0, +\infty)\}$, is

$$V(0) = \int_0^{\infty} \pi(t)e^{-rt}dt.$$

If $\pi(t) = \pi$,

$$V(0) = \pi \int_0^{\infty} e^{-rt}dt = \frac{\pi}{r}.$$

Outline

Example 3 (An Intuition of Exponential Functions)

The Maclaurin series of the exponential function e^t is

$$e^t = \sum_{n=0}^{\infty} \frac{1}{n!} t^n = 1 + \frac{1}{1!} t + \frac{1}{2!} t^2 + \frac{1}{3!} t^3 + \cdots + \frac{1}{n!} t^n + \cdots$$

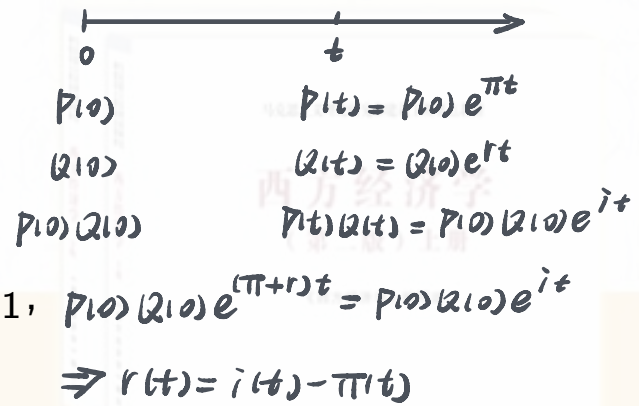
The mathematical constant e is the maximum possible result when compounding 100% growth for one time period.

Example 4 (Nominal and Real Interest Rates)

The nominal interest rate is the rate of interest that investors pay to borrow money. The real interest rate is the nominal interest rate corrected for the effects of inflation. What is the relationship between nominal and real interest rates?

For a continuous-time case, the real interest rate $r(t)$ is equal to the nominal interest rate $i(t)$ minus the inflation rate $\pi(t)$. That is,

$$r(t) = i(t) - \pi(t).$$



For a discrete-time case, we have an analog:

$$1 + r_t = \frac{1 + i_t}{1 + \pi_{t+1}}, \text{ or } r_t \approx i_t - \pi_{t+1},$$

where $\pi_{t+1} = P_{t+1}/P_t - 1$ is the inflation rate.

离散情况：$(1 + r_t)(1 + \pi_{t+1}) = (1 + i_t)$.

Example 5 (Asset Pricing)

Let P_t be the price of a stock at the beginning of period t; d_t be the dividend announced at the beginning of period t but received at the end of period t; r_f be the rate of return on the riskless asset; and α be the risk premium. Free arbitrage between stocks and riskless asset leads to

$$\frac{P^e_{t+1} - P_t + d_t}{P_t} = r_f + \alpha, \text{ or } P_t = \beta P^e_{t+1} + \beta d_t,$$

where $\beta \triangleq \frac{1}{1+r_f+\alpha}$. Find the solution for P_t.

The solution to the difference equation is

$$P_t = \beta^T P^e_{t+T} + \sum_{i=0}^{T-1} \beta^{i+1} d^e_{t+i} = \lim_{T\to\infty} \beta^T P^e_{t+T} + \sum_{i=0}^{+\infty} \beta^{i+1} d^e_{t+i},$$

where $\sum_{i=0}^{+\infty} \beta^{i+1} d^e_{t+i}$ is the fundamental value of a stock.

$\lim_{T\to\infty} \beta^T P^e_{t+T}$ is the bubble value of a stock.

Outline

疑难重点

(1) Nominal GDP 和 Real GDP 的区别是什么？为什么要区分它们?

(2) Quantity Indexes(Laspeyres, Paasche, and Chain-type) 怎么计算?

(3) Price Indexes(Laspeyres, Paasche, and Chain-type) 怎么计算?

(4) 了解常见的价格指数：GDP deflator, PCE deflator, CPI, PPI。衡量生活成本时，GDP deflator and CPI 哪个会高估生活成本?

(5) 如何计算通货膨胀率?

(6) 掌握 Employment, unemployment, the labor force, unemployment rate, participation rate, employment/population ratio 的概念和计算。

(7) 掌握 simple interest, compound interest, continuously compound interest, growth rates, present value.

(8) 掌握贴现的计算方法。

(9) 掌握 Nominal and real interest rates 之间的关系。

(10) 用贴现的思想理解资产定价公式。掌握差分方程的前向求解法。

马工程教材疑难重点

1 (E2, p.28)

根据马工程教材观点，应当如何评析西方经济学的价格水平指标?

2 (E2, p.28)

根据马工程教材观点，应当如何评析西方经济学的失业指标?