Econ 103: Principle of Macroeconomics

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Contents

1 Intro to Macroeconomics

1.1 Topics Macroeconomics concern

- GDP
- Inflation
- Unemployment

1.2 Government role in economy

- Fiscal policy
- Monetary policy
- Growth policy

1.3 Category of Markets

- Goods & Service
- Money/Financial
- Labor

2 Measuring, National Output and income

2.1 GDP

- Formula:

$$GDP = Aggregateexpenditure = Aggregateincome \tag{1}$$

- Definition: Production located **in the country**
- $Aggregate\ Expenditure = C + I + G + (EX - IM)$
  - $C = Durable\ good + Nondurable\ good + service$
  - $I = Residential\ Investment + Nonresidential\ Investment + Change\ in\ Inventories$
  - $G = Government\ spending$
- $Aggregate\ Income = national\ income + depreciation + (indirect\ taxes - subsidies) + net\ factor\ payments\ to\ the\ rest\ of\ the\ world + other$

2.2 GNP

Definition: Production owned by **a countrys citizen**

2.3 Nominal and Real GDP

- $Nominal\ GDP = \sum Current\ Price\ \times Current\ production$
- $Real\ GDP = \sum Base_year\ Price\ \times Current\ production$

3 Unemployment, Inflation, and Long-Run Growth

3.1 Ideal Economy

- Low unemployment
- Low inflation
- Rapid growth of output

3.2 Feature of Labor Force and Categorize the Population

3.2.1 Labor Force

Feature:

- Over 16 years old
- Have a job or is looking for a job

Unemployed:

- Is not working
- Is available for work
- Has effort to find a job

3.2.2 Formulas

$$Labor\ Force = Employed + Unemployed \tag{2}$$

$$People\ over\ 16 = In\ Labor\ Force + Not\ in\ Labor\ Force \tag{3}$$

$$Unemployment\ Rate = \frac{Unemployed}{Labor\ Force} \tag{4}$$

$$Labor\ Force\ Participation\ Rate = \frac{Labor\ Force}{Population\ Over\ 16} \tag{5}$$

3.3 Natural Unemployment

Natural Employmeny includes **Frictional Unemployment** and **Structral Unemployment** Definitions:

- Frictional Unemployment: Unemployment due to normal working of market like **Short-time Job/Skill Matching Problems**
- Structral Unemployment: Unemploymeny due to **Change of structure of ecomony**

4 Aggregate Expenditure & Equilibrium Output without Govornment

4.1 Aggregate Income and GDP

Formulas:

$$Y \equiv C + S \tag{6}$$

$$C = a + MPC \cdot Y (0 < MPC < 1) \tag{7}$$

$$MPC + MPS = 1 \tag{8}$$

$$Change\ in\ Inventory = Production - Sales \tag{9}$$

4.2 Equilibrium

- When equilibrium: $Y = AE \equiv C + I$
- When $Y > C + I$: Actual investment is greater than planned investment
- When $Y < C + I$: Actual investment is greater than planned investment

4.3 Mutiplier

$$Multiplier = \frac{1}{MPS} = \frac{1}{1 - MPC} \tag{10}$$

$$\Delta Y = \Delta I \times Multiplier \tag{11}$$

5 Aggregate Expenditure & Equilibrium Output with Government

5.1 Formulas

After Tax Income:

$$Y_d \equiv Y - T \tag{12}$$

Aggregate Expenditure:

$$AE \equiv C + I + G \tag{13}$$

and

$$C = a + MPC \times Y_d \tag{14}$$

When equilibrium:

$$Y = AE = C + I + G \tag{15}$$

Budget Deficit:

$$D \equiv G - T \tag{16}$$

$$Leakages = Injections \Leftrightarrow S + T = I + G \tag{17}$$

5.2 Multipliers

- Government Spending Multiplier: $\frac{1}{MPS} = \frac{1}{1-MPC}$ and $\Delta Y = \frac{\Delta G}{MPS}$
- Tax Multiplier: $-\frac{MPC}{MPS}$ and $\Delta Y = \Delta T \cdot -\frac{MPC}{MPS}$
- Balanced Budget Multiplier: 1 and $\Delta Y = \Delta G$

6 Money Supply and Federal Reserve System

6.1 Functions of Money

- Means of Payment
- Storage of Value
- Unit of Account

6.2 Conceptions

- Barter: Direct exchange of goods
- Commodity monies: Items used as money and also have **intrinsic value** in some other use
- Fiat / Token: Money that is **intrinsically worthless**
- Legal Tender: Money that govornment required to be accepted in settlement of debts
- M1(Transactions money): $= current\ held + demand\ deposits + travelers\ check + other\ checkable\ deposits$
- M2(Broad money): $M1 + savings + money\ marketaccounts + other\ near\ monies$

6.3 Modern Bank System

Principle: $Asset - Liabilities = Net\ Worth$

Components:

Asset	Liability
Reserves	Deposits
Loans	Net Worth

6.4 Creation of money

Principle $Actual\ Reserves \times Money\ Multiplier = Deposits\ created\ in\ banking\ system$

Money Multiplier $= \frac{1}{Required\ Reserve\ Ratio}$

Methods

- Changing **Required Reserve Ratio**
- Changing **Discount Rate**(New borrowed money become part of the reserve)
- **Open market operation**: purchase and sale government securities in open market

7 Money demand, the equilibrium interest rate and monetary policy

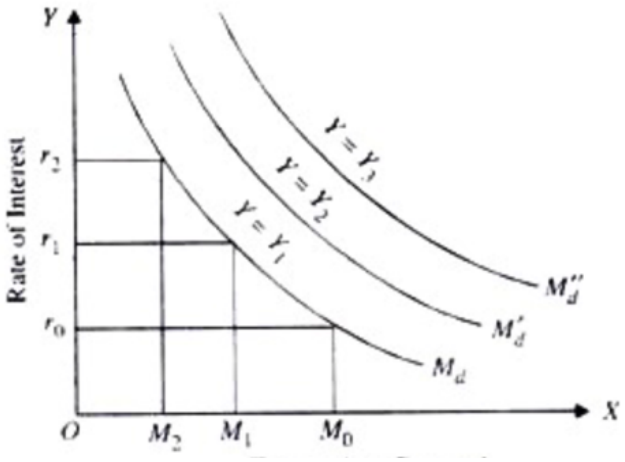
7.1 Factors that affect demand for money

Transaction Motive People hold money to buy things they need

Speculative Motive Invest the money they have to get more money

7.2 Relation between Interest Rate and Money Supply

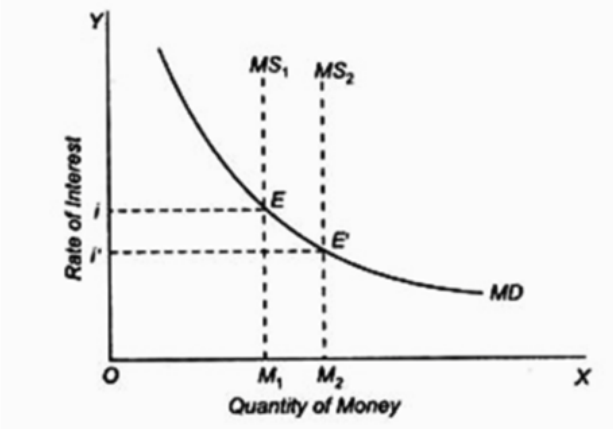
Interest Rate and Money Supply is negatively related



Property

- $Y \uparrow \Rightarrow M^d \uparrow$(Shift Right)
- $Y \downarrow \Rightarrow M^d \downarrow$(Shift Left)

Money Demand and Supply Equilibrium The intercection point of MD and MS gives a point of equilibrium



7.3 Monetary Policy

Tight monetary policy Contract money supply to restrain the economy

Easy monetary policy Expand money supply to stimulate the ecomony

8 Aggregate Demand in the Goods and Money Markets

8.1 How Goods Market and Money Market Related

Goods Market: $Y = C + I + G$ (depends on r)
Money Market: $M^d = M^s$ (Money demand depends on Y)

- $Y \uparrow \Rightarrow M^d \uparrow \Rightarrow r \uparrow$
- $r \uparrow \Rightarrow I \downarrow \Rightarrow AE \downarrow \Rightarrow Y \downarrow$

8.2 Effects of policies

Expansionary fiscal policy(Crowd-out Effect):

$$G \uparrow or\ T \downarrow \Rightarrow Y \uparrow \Rightarrow M^d \uparrow \Rightarrow r \uparrow \Rightarrow I \downarrow \tag{18}$$

Expansionary Monetary Policy:

$$M^s \uparrow \Rightarrow r \downarrow \Rightarrow I \uparrow \Rightarrow Y \uparrow \Rightarrow Y \uparrow \Rightarrow M^d \uparrow \tag{19}$$

Contractionary fiscal policy:

$$G \downarrow or\ T \uparrow \Rightarrow Y \downarrow \Rightarrow M^d \downarrow \Rightarrow r \downarrow \Rightarrow I \uparrow \tag{20}$$

Contractionary monetary policy:

$$M^s \downarrow \Rightarrow r \uparrow \Rightarrow I \downarrow \Rightarrow Y \downarrow \Rightarrow Y \downarrow \Rightarrow M^d \downarrow \tag{21}$$

Aggregate Demand (AD) curve: The higher the price level (P), the lower the aggregate e output, increase , increase G or decrease T supply shift AD curve to the RIGHT, vice versa

9 Aggregate Supply and the Equilibrium Price Level

9.1 Aggregate Supply Curve

In the short run: $Y \uparrow \Rightarrow P \uparrow$ and in the long run: AS curve is a vertical line, Y increase at the same rate as overall price level

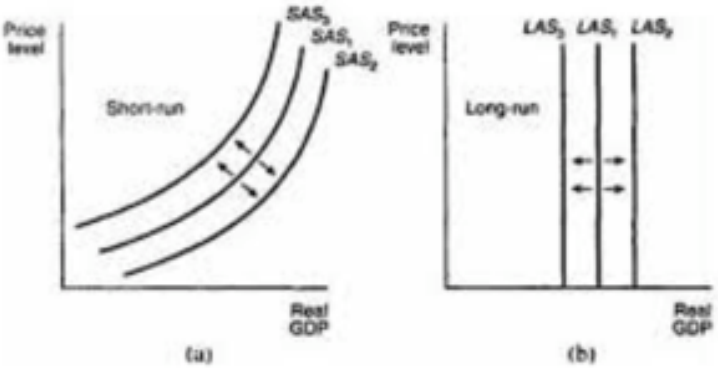


Figure 2 Shifts of the aggregate supply curve

9.2 Cost Shock on Supply

Increase AS(shift right)

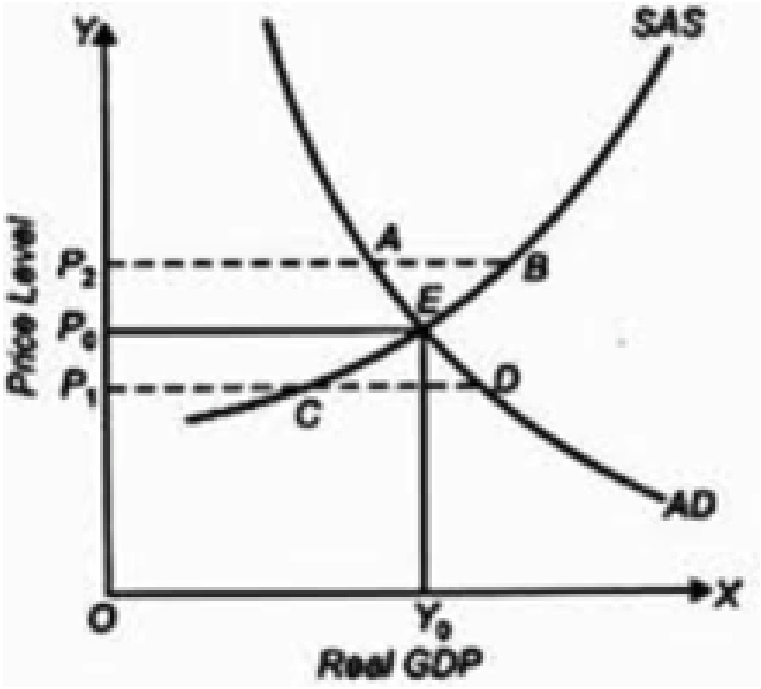
- Lower cost
- Economic growth

- Public policy like tax cut, deregulation
- Good weather

Decrease AS(shift left)

- Higher cost
- Stagnation
- Public policy like waste, inefficiency and over-regulation
- Bad weather, disaster

9.3 Equilibrium



10 Labor Market

10.1 Classic View of Labor Market

10.1.1 Formulas

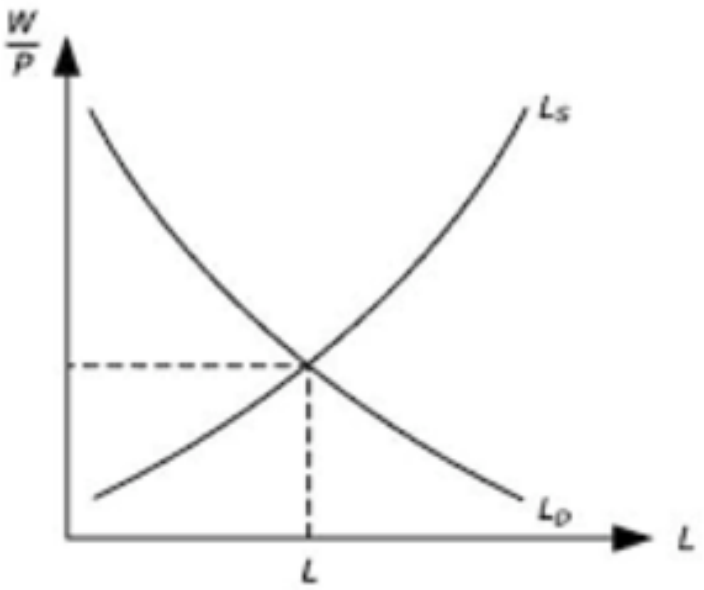
$$Labor\ Force = Employed + Unemployed \tag{22}$$

$$People\ over\ 16 = In\ Labor\ Force + Not\ in\ Labor\ Force \tag{23}$$

$$Unemployment\ Rate = \frac{Unemployed}{Labor\ Force} \tag{24}$$

$$Labor\ Force\ Participation\ Rate = \frac{Labor\ Force}{Population\ Over\ 16} \tag{25}$$

10.1.2 Equilibrium



Classical economists believe the labor market always clears because:

- When wage rates raise up, labor supply will increase
- Vice versa, when wage rates go down, people either accept job with lower wage or leave the job market

10.2 Beyond classical view

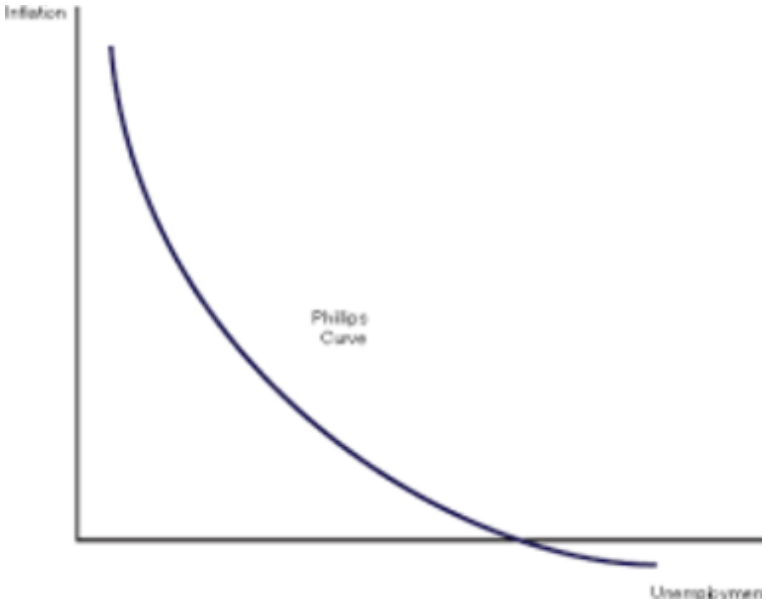
10.2.1 Theories

- Sticky wage (wage fails to fall when demand decrease)
- Social / implicit contract (unspoken agreement not to cut wage)
- Explicit contract (set wage explicitly)

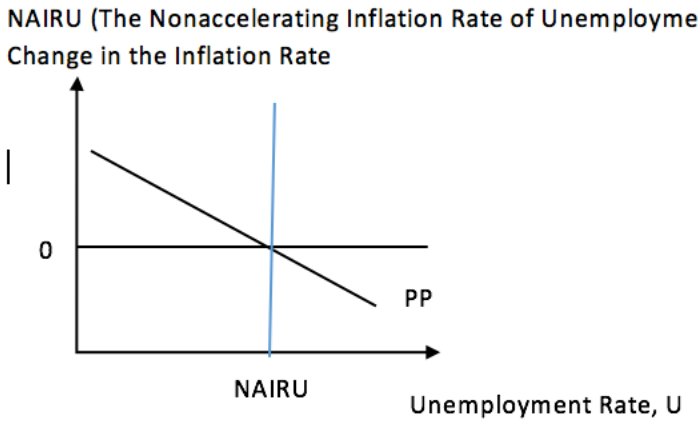
  - Cost of living adjustments (COLAs)
- The efficiency wage theory
- Imperfect information (wrongly set wage due to lack of info)
- Minimum wage laws

10.2.2 Philips Curve

Short-run Philips Curve:



Phillips Curve fails to work in long run since both AD and AS are shifting and become vertical curve which intersect the x-axis at **Natural Rate of Unemployment** (U^*), which is at potential GDP.



Favorable shift is to the left, since we can have a lower NAIRU, which is caused by foreign competition

- Input price↑ ⇒ SPAS to the left, SRPC and PP to the right
- Inflationary expectation↑ ⇒ SPAS to the left, SRPC and PP to the right
- Foreign Competition↑ ⇒ SRAS to the right, SRPC and PP to the left

11 Financial Crisis, Stabilization and Deficits

11.1 Methods to obtain money

- Bank Loan
- Bond issuance(Public debt)
- Stock(Ownership of a firm)

11.2 Stock Market

Factors that affect price of stock

- Expectation of future profits
- Expectation on what others would pay

Index to measure Stock Market

- Dow Jones Industrial(30)
- NASDAQ (Over 5000)
- Standard and Poors 500(500)

11.3 Reasons for govornment's failure

Time Lags

- Recognition Lag (Statistic)
- Implementation Lag (Congress)
- Response (Operation of economy itself)

Cut in government spending cause economy to contract, and decrease tax revenue, increase transfer payment

11.4 Deficit Response Index (DRI)

Method to calculate the effect of govornment action:

1. $\Delta Y = \Delta G \times Government\ Spending\ Multiplier$
2. $\Delta D = \Delta Y \cdot DRI$
3. $D = D_0 + \Delta D + \Delta G$

12 Long Run Growth

Economic growth An increase in the total output of an economy

Factors

- Increase in Labor Supply
- Increase in physical or human capital
- Increase in Productivity
  - Invention: Advance in knowledge
  - Innovation: Use of new knowledge

Limitations to growth

- Failure to enforce the rule of law
- Wars and revolutions
- Poor public health and education Law savings and investments

Policies for Faster Growth

- Stimulate Saving
- Stimulate Research and Developement
- Improve quality of education
- Improve health
- Encourage international education

13 Alternative Views in Macroeconomics

13.1 Monetarism

Velocity of Money $V \equiv \frac{GDP}{M}$

Nominal Income $GDP \equiv P \times Y \Rightarrow M \times V \equiv P \times Y$

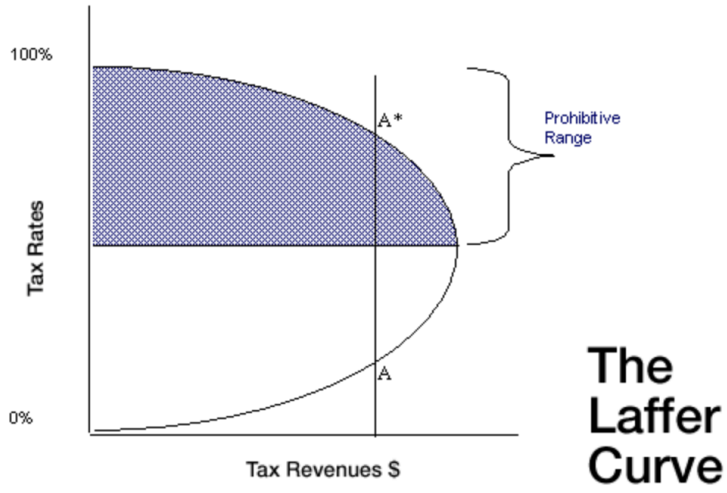
Quantity Theory of Money Key assumption is that velocity of money is constant over time: $M \times \bar{V} = P \times Y$, which means that inflation is always and solely a monetary phenomenon. **Milton Friedman** advocated a policy of steady and slow money growth at the rate equal to the average growth of real output.

13.2 New Classical Macroeconomics

13.2.1 Supply-Side Economics

Supply-siders thinks that the problem of the economy is on supply side because of high rate of taxation abd heavy regulation that reduced the incentive to work, to save and to invest.

According to the Laffer Curve, there is some tax rate beyond which the supply response is large enough to lead to a decrease in tax revenue for further increase tax rate.



13.3 New Keynesian Economics

Assumption

- Rational Hypothesis
- Sticky Price

Lucas Supply Function $Y = f(P - P_{expect})$ embodies the idea that output depends on the differance between the actually price and expected price level.

14 International Trade, Compatative Advantage and Protectionism

14.1 International Trade

Trade Surplus Export more than import

Trade Deficit Import more than export

David Ricardo's Theory of Comparative Advantage

- Absolute Advantage
- Comparative Advantage

- Specialization ⇒ Mutual Benefit

14.2 Other Theory and Concepts

Terms of Trade The ratio at which a country can trade domestic products for imported products

Exchange Rate Ratio at which two currencies are traded, or the price of one currency in terms of another

Factor Endowments Quality and quantity of labor, land and natural resources of a country

Heckscher-Ohlin Theorem A country has a comparative advantage in the production of a product if that country is relatively well endowed with inputs used intensively in the production of that product.

14.3 Protectionism

Protection A practice of shielding a sector of the economy from foreign competition

Tariff Tax on imports

Quota A limit on the quantity of imports

Dumping A industry that sells products in world market below the cost of production

Reason for protection

- Save jobs
- Fairness of competition
- National security
- Discourage dependency
- Protect infact industry

14.4 Free Trade

- General Agreement on Tariff and Trade(GATT)
- World Trade Organization(WTO)
- European Union(EU)
- The North American Free-Trade Agreement(NAFTA)

15 Open-economy macroeconomics

Balance of payments Record of a country's transactions in goods, services and assets with the rest of the world and the supply and demand of foreign exchange

Current Account The sum of:

- Net Exports
- Net Income from investments abroad
- Net Transfer payments from abroad

15.1 Equilibrium in an Open Economy

Aggregate expenditure $AE \equiv C + I + G + EX - IM$

- $C = a + bY$
- $I = I_0$
- $G = G_0$
- $EX = EX_0$
- $IM = mY$

$\Rightarrow Y^* = \frac{1}{1-b+m}(a + I + G + EX)$

Trade Feedback Effect The tendency for an increase in the economic activity of one country to lead to a worldwide increase in economic activity, which feeds back to that country. It is a process that **a domestic price increase in one country can "feed back" on itself through export and import prices**.

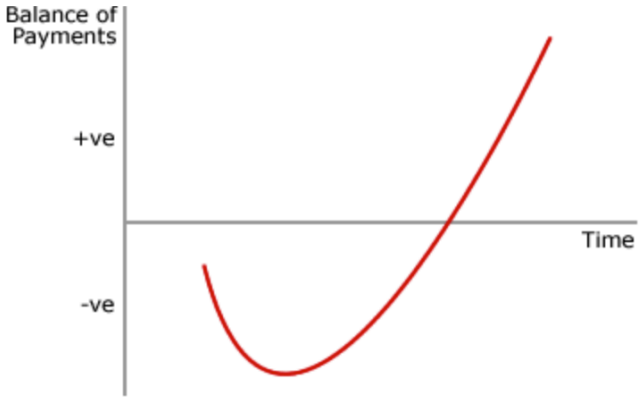
15.2 Floating Exchange Rate

In a money market where there is floating exchange rate, currency is like a good, and the equilibrium of its demand and supply determines its price.

The law of one price If the transportation fee is ignoreable, the price should be roughly the same

Effects of Exchange Rate on the Economy

- Depreciation: Increase spending on US goods ⇒ AE increase ⇒ Inventory fall ⇒ GDP increase
- According to J Curve, the balance get worse before it gets better when depreciation



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