National Income Accounting

Key:
(1) How NYI translates into SOL.
(2) Limitations of NYI in measuring SOL.

National Income Indicators

Purpose:
Measure level of economic activity
Guide decision making
Measure SOL (material and non-")

<u>Interpretation of NY</u>

NP= NI
=NE

- O/p approach
- Expd approach
- Y approach

GDP | GNI

Alternative indicators

Gini	HDI
Refer to "Equity" Notes. Scale of 0 (complete equality) to 1 (complete inequality)	Qty of resources available to ppl Ability to use g/s Time to use g/s

Limitations (across time and space)

In measurement:
1. Inadequate and Unreliable info (T/S)
2. Unrecorded items (non mkt item and underground eco)
   I. Non-mkt items (T/S)
   II. Underground economy (T/S)

GDP usually reflects material aspect of SOL quite accurately, less so the non-material SOL.

Material SOL (GDP data can skewed due to…):
1. Price changes (T)
2. Size of population (T/S)
3. Exchange rate (S)
4. Income distribution (T/S)
5. Types of expenditure (T/S)
6. Quality of goods(T/S)
7. State of Em of eco

Non-material SOL:
1. Amount of leisure time (T/S)
2. Externalities (T/S)
3. Opp cost

<u>Best indicator of SOL</u>
Across Time: Real GDP per capita
Across Space: Real GDP per capita at PPP

Past A-level Question:

(1) Discuss the extent to which such government expd on infrastructure projects will lead to a rise in living strds of a country. [15m]

(2) Assess the extent to which SG's economic performance is the main determinant of its population's SOL. [15m]

(3) Discuss whether the openness of the economy is beneficial or harmful to the SOL in SG. [25m]

(4) Explain the link between the SOL, cost of living and macroeconomic performance of a country. [10m]

(5) Discuss the limitations of these statistics in both assessing the change in SOL in SG economy in 2011 and comparing it with that of other economies. [25m]

Definitions:

- Standard of living comprises of material and non-material well-being.
- Material well-being is measured by the quality and quantity of g/s available for residents to consume, which is represented by national income figures, specifically real GDP, which measures the market value of *final* goods and services produced *within* a country's geographical boundary during a given period of time, taking into account price changes.
- On the other hand, non-material wellbeing can be measured by environmental indicators like the presence of externalities and urban crowding, as well as socio-economic indicators like life expectancy, education, and leisure time.

- PPP measures the amount of foreign currencies needed to buy the same basket of g/s in 2 countries, equalising the purchasing power of different currencies by eliminating the differences in price levels between countries.
  N.B. Takes into account **COL** and **PP** of currency

NYA can be used to measure (material) standard of living (Qty/ Qly):

Directional changes of AD	Magnitude of change ($\Delta NY = k\Delta AD$)
Increase in **real GDP** → increase **amount of g/s available for consumption** by residents in SG → increase **material SOL**	The extent of increase in material well-being is dependent on the **nature of the economy** and the **proportion of government spending as a proportion of GDP**. Don't cover mpt first. Use it for another point. In Singapore, the value of k is small because of relatively large mps and mps (refer to ITME Notes for exp). This implies that an increase in government expenditure will lead to a smaller multiple increase in NY, leading to a smaller increase in material well-being. Besides, the SG govt generally practice fiscal prudence where we spend within our means, while maintaining sufficient reserves for contingencies. As such, it is likely that government spending as a proportion to GDP is low , thereby leading to a small increase in AD and a smaller increase in material wellbeing.

Structuring SOL points:
1. Point
2. Elaboration with economic concepts
3. Example
4. Link to SOL rising/ falling

Limitations of NYA to measure SOL:

1. Inadequate and Unreliable Information
   - Depends on the level of statistical sophistication: e.g. SG > Indonesia
   - Depends on how ease of access to data
   - Data collection has become more comprehensive and reliable → more information input and more accurate analysis (IT advancement)→ **differences in reliability of data over time → comparison more difficult**
   - No internationally agreed method of measuring NY → not ever country use same basis for calculation → different countries may treat entries of some items differently in their accounting
   - Size of country can affect reliability of data collected→ inaccessible rural areas → **collection of data extremely difficult → understatement of NY →** unfair and inaccurate to compare living standards with other counties.

2. Unrecorded Items
   - **GDP counts g/s transacted in market AND declared to the government.**
   - O/p of some g/s not recorded → understate level of production to economy

   I. Non-Market Items
   - **G/s not transacted in the market**
   - Increased monetisation of transactions over time → Increase GDP over time, but production of g/s actually has not increased, SOL has not increased
   - Higher degree of specialisation in developed countries → GDP is higher than in developing countries, but production of g/s may be around the same, no difference in SOL

   II. Underground Economy
   - **G/s transacted in the market**
   - Illegal and hence undeclared transaction (e.g. drugs, prostitution)
   - Legal transactions that should be declared but are not (e.g. moonlighting)
   - If significant number of transactions in market are undeclared → understate NY
   - Developing countries tend to have a larger underground economy

   - Treatment of certain items differ across countries
   - Example: Consumption of cannabis is allowed in Netherlands but illegal in SG → GDP Netherlands > SG → if differ greatly in size of underground economy → computed GDP per capita may not give true comparison of SOL
   - Illegal transactions become legal over the years → increased declared transaction over time → increase GDP, but production of g/s actually has not increased, inaccurate estimation of growth of SOL → SOL may not have increased

N.B. To distinguish explanation for non-mkt items and underground economy.

Limitations of NYA to measure SOL:
Increase in GDP (Real/ Nominal) may not translate to increase SOL for the avg resident.

1. Price Changes
   - % change in real GDP = % change in nominal GDP - % change in price level
   - $Real\ GDP = \frac{Nominal\ GDP}{CPI} \times 100$

   [Material SOL]
   - Increase in money value of (nominal) GDP does not necessarily mean a rise in the volume of /s → could be due to rising prices rather than a rise in actual o/p

2. Size of Population
   - $Real\ GDP\ per\ capita = \frac{Real\ GDP}{total\ population}$

   [Material SOL]
   - If size of population **increases by equal or greater proportion to/ faster than** increase in real GDP → amount of g/s available for consumption may not increase → material well-being for avg resident may not have increased
   - Example: HK BNO passport holders given a path to residency and citizenship in UK after the turmoil in HK AND Potential influx of immigrants due to loosening of immigration rules in countries with ageing population like Japan

   [Non-material SOL]
   - With respect to increase in G: If government spends on increasing the number of MRT cabins to accommodate **current** population size, then the current infrastructure may be overwhelmed when there is a **faster** increase in population size. Therefore, travelling times may not be reduced and non-material well-being may not improve and SOL may not increase.

3. Exchange rate
   [Material SOL]
   - GDP figures for different countries denominated in different currency → need to be converted to common currency → GDP converted using official exchange rates are determined by SS and DD factors in forex mkt → **volatile** (speculative activity and government interventions in the currency market) + **do not reflect relative PP of currencies** (GPL differs across countries) → use GDP per capita at PPP (ins defn) → makes up for limitations of conversions using official e/r → higher GDP per capita at PPP → higher amt of g/s available for consumption in ctry A vs ctry B → higher material SOL in ctry A
   - Example: SG and US GDP per capita converted using e/r are similar, but doesn't imply similar SOL if avg pxes in US higher than SG → same amt of income buy less in US → better to use PPP

   - Limitations of PPP:
     a. Qualitative differences of pds across countries not accounted
     b. Basket of goods consumed differs according to country's climate and culture

4. Income distribution
   [Material SOL]
   - Higher real GDP → higher income paid to owners of FOP → if uneven distribution of income → most of higher income may only go to small rich minority like owners of construction companies/ urban populations, while majority of the economy like construction workers/ rural populations may not enjoy higher income → may not increase in amount of g/s available to avg resident → material well being and living standards may not increase
   - GDP can be **supplemented** with Gini Coefficient
   - Gini coefficient decrease over time → income more equally distributed over time → if real GDP per capita increases → income for the poor increases → likely increase SOL for avg resident

5. Type of expenditure/ breakdown of real GDP per capita
   [Material SOL]
   - Production not equal consumption → if investment is concentrated on production of capital goods → increase AD → increase real GDP per capita→ level of consumption per head unchanged → SOL for avg resident may not have increased
   - BUT increase amount of capital goods to produce consumer goods in the future → increase amount of g/s available for future consumption to an avg resident → increase **future** SOL

6. Quality of Goods
   - Even if GDP remains the same, increase in e quality of o/p / development of new pds → increase in SOL

7. Economy operating at full employment
   - Economy operating at full employment (e.g. in ctries with strong AD) → little unemployed resources available to be employed → even though AD increase → does not lead to increase in g/s produced in economy → material well-being and living standards may not rise
   - Furthermore, increased competition for scarce FOP → higher factor i/p pxes → may be passed on to consumers in terms of higher pries → COL increases → consumers able to purchase less g/s → adversely affect material well-being and living standards

Limitations in measuring **non-material** well-being:

1. Amount of Leisure Time
   - Increase working hours → increase o/p → decrease in leisure time → well-being might not have increased to same extent → growth in NY overstate improvement in well-being

2. Externalities
   - Production and consumption generate -ve ext. (e.g. pollution/ congestion/ damage and depletion of natural resource) → for example, machinery and heavy equipment used in construction work contribute to noise pollution, which may cause sleep disturbances and stress to residents living near construction works + residents may be exposed to high levels of dust particles in the air generated by drilling/ demolition works leading to adverse health outcomes like respiratory infections → deterioration of non-material well-being → adversely affect living standards

   - With respect to increase in G: Improvements in transport structure such as wider roads or more extensive MRT lines may reduce traffic congestion thereby reducing the level of negative externalities generated. Specifically, the level of carbon emissions may fall and air quality may improve. Since residents are able to enjoy cleaner air, there will be an improvement in non-material well-being.
   - Nevertheless, **the extent to which spending on large scale infrastructure can improve nonmaterial well-being depends on the current state of infrastructure**. The improvement in air quality and leisure time is only significant if spending is made on current infrastructure that is relatively undeveloped, such as the poor transport infrastructure in Indonesia which results in regular massive congestion. However, for countries such as Singapore, government spending to enhance the already developed infrastructure may only lead to marginal improvement in nonmaterial well-being.

3. Opportunity cost
   - With respect to increase in G: Limited budget → govt face opportunity cost in terms of improving living standards → if spend more on infrastructure → less funds available for other purposes like enhancing healthcare/ education → opportunity cost in terms of govt forgoing higher literacy rate or health expectancy that an average resident could have enjoyed had the funds been spent on improving healthcare and education → while government expenditure could have improve living standards, there is a trade-off → comes at the expense on improvement in other aspects of well-being → overall living standards may not rise

- GDP figures could be used in conjunction with other indicators like MEW, HDI, air and water quality indicators like pollutant standards index or PSI. MEW is GDP figures adjusted to include an assessment of the value of leisure time and the amount of unpaid work In an economy, such as housework, hence increasing the welfare value of GDP. It also includes the value of environment damage caused by industrial production and consumption which reduces the welfare value of GDP.

- Human Development Index (HDI)

- Substitutes NY indicators - Considers material and non-material SOL	Qty of resources available to ppl	Ability to use g/s	Time to use g/s
	GNI per capita (in constant PPP)	Education (expected and mean yrs of schooling	Life expectancy at birth
	0 to 1 (higher HDI) for each component → average to get overall HDI → SOL		

Takeaways from CSQ

Be flexible with info provided by CSQ material!
E.g. Higher infant mortality → more hospital + better qly healthcare → higher material SOL
E.g. More TV → more people can afford more g/s → higher material SOL

Explaining non-material SOL:

Given that data on televisions per 1000 inhabitants …	Given data on infant mortality per 1000 live births per annum…
Number of TV → **degree of leisure hours per day/ level of work life balance** → non-material SOL	Poor **sanitary conditions** (i.e. dirty living conditions, poor hygiene) → high infant mortality → non-material SOL

To compare COL between 2 countries:

- Use $\frac{PPP\ adjusted\ GDP}{GDP\ at\ current\ exchange\ rate}$
- Example: Mexico's $\frac{PPP\ adjusted\ GDP}{GDP\ at\ current\ exchange\ rate}$ is **higher** than Korea's $\frac{PPP\ adjusted\ GDP}{GDP\ at\ current\ exchange\ rate}$. Since PPP have to be inflated the most in Mexico, prices are lower in Mexico compared to in Korea, and hence COL in Mexico is lower.

- Example (RI JC2 Prelim 2021 CSQ 2)

With reference to Table 3, what does the data suggest about the cost of living in Saudi Arabia as compared to that in Singapore. Justify your answer. [2]

Table 3: Key Economic Indicators of Saudi Arabia and Singapore

	Saudi Arabia	Singapore
GDP/capita (constant USD)	20542	59374
GDP/capita (PPP USD)	46962	98411
Unemployment rate (% of labour force)	6.13	3.1
Consumption expenditure (% of GDP)	63	46

Source: The World Bank

Answer:

- Cost of living is higher in Singapore (SG) than Saudi Arabia.
- Measuring GDP per capita at PPP allows for difference in cost of living between 2 countries to be eliminated; PPP measures the amount of foreign currencies needed to buy the same basket of g/s in 2 countries, equalising the purchasing power of different currencies by eliminating the differences in price levels between countries.

- From Table 3, Singapore's GDP / capita (constant USD) and GDP/capita (PPP USD) are both higher than Saudi Arabia's.
- Singapore's GDP / capita (constant USD) is 2.9 times that of Saudi Arabia, which suggest that the average citizen in SG can purchase and consume **2.9 times more** than an average citizen in Saudi Arabia for a common basket of goods and services.
- However, when we use GDP / capita (PPP USD) to eliminate the price level difference in the 2 countries, Singapore's GDP / capita (PPP USD) is only 2.1 times that of Saudi Arabia, which suggest that the average citizen in SG can purchase and consume a lower **2.1 times more** than an average citizen in Saudi Arabia for the same basket of goods and services.
- Thus, the cost of living in SG is higher than in Saudi Arabia.

Possible evaluation criteria:
1. Theory vs reality
2. Question assumptions
3. SR vs LR
4. Tradeoffs, CB analysis
5. Root cause
6. Counter proposal
7. Perspectives

Evaluation:
- Provide counter proposals: MEW, Gini, Air qly
- Provide further insight:
  Income equality cld make comparison inaccurate → Gini
  Diff lvl of ext cld make comparison inaccurate → Air qly

Glossary of Attempted EQ

Focus solely on G, no need talk about C, I, NX

Need to be **flexible to adjusting the phrasing of limitations of measuring SO**L. Can be in terms of:
1. Information needed to assess SOL(Tut Qn)
2. Reasons for SOL not rising (1)(b)

(1)(a) Explain how an increase in government expenditure on large scale infrastructure can affect national income (10m).

Requirements:

- k-process (4 assumptions, period 1-3, period 4 to nth period, formula and size of k, formula for ΔNY and overall ΔNY)
- AD-AS diagram + explanation

(b) Discuss the extent to which such government expenditure on infrastructure projects will lead to a rise in living standards of a country (15m).

Structure:

- Explain how increase in G will lead to rise in SOL of a country (Direction + Magntitude)
- Explain how increase in G will **not** lead to a rise in SOL of a country

Evaluation:

- **Improvement in living standards depends on the type of capital spending by the government**
  If govt spend on transport infrastructure → increase in material and non-material wellbeing in future
  if govt spend on improving defence infrastructure like upgrading military equipment → cannot be used in production of consumer g/s in future → does not contribute to material well-being → does not lead to improvement in living standards

- **Increase in government spending on infrastructure projects will facilitate further improvements in living standards in the future**
  Government spending on infrastructure projects → growth in productive capacity → accommodate future increases in real GDP → even if living standards may not have improved in SR, further improvement in living standards in the future will be facilitated

- **Financing government spending on infrastructure projects by borrowing may be at expense of improvements in living standards in the future**
  Government finance spending by borrowing → tax rates have to be raised/ spending has to be cut in future to repay debt → living standards increase in SR at expense of improvement in living standard in future

- **Improvements in living standards from increased government spending on infrastructure may only be evident in long run**
  Construction work needs time to complete → government expd on infrastructure projects does not lead to an immediate increase in consumer services like public transport services

Information needed to assess SOL type of question:
Don't give better indicators at the start → leave **scope for limitations and EV**

(2) It was reported that in the last 10 years, there has been an improvement in the standard of living of the average person in Namibia.

need to use per capital information | 10m: 3pts (magic number) | material and non-material

(a) If you were asked as an economist to show that the average person in Namibia is better off than 10 years ago, explain what information you would need (10m).

(b) Comment on the difficulties of comparing living standards between countries (15m).

Change in real GDP per capita= 2% - 1.3% = 0.7%

GPL data is not useful here.
Over time: Real GDP figures alr given
Over space: Same time period no need consider difference in GPL only PPP

(3) In 2016, Singapore's GDP at 2010 pries grew by 2%, the total population grew by 1.3%, general price level increased by 1%.

Discuss the limitations of these statistics in both assessing the change in SOL in the SG economy in 2016 and comparing with that of other economies (25m).

across space: best indicator being GDP per capital at PPP

across time: best indicator being real GDP per capita

Evaluation:

- Even if income gap has narrowed over time, this may not necessarily imply that material SOL has increased.
  It may be the case that both high- and low-income groups have seen their incomes rising → just that the lower income group saw their income rising at a much faster rate than the high income group → both groups enjoy more g/s. In absolute terms, the lower income could still be earning far less than the high income which suggests they are not able to consume similar basket of gds → unequal SOL within ctry

- With the deterioration in health, households will have to spend more on medical services which contribute towards the real GDP per capita. The growth in real GDP per capita in this case therefore likely over-states the actual improvement in SOL.

- Some countries have estimated figures of the size of the underground economic activities in the country, but these figures are rarely accurate due to the opaque nature of these economic activities.

- In future, countries can consider improving on data collection, standardising across countries to allow for more accurate assessment and comparison.

- NY figures were not intended to measure SOL, but to measure the production of a country, hence, it can only be used as a proxy for SOL.

Appendix:

- National Product is the money value of all final g/s produced by the factors of production of a country during a given period of time (usually a year)
- National Income is the sum of incomes earned by the factors of production of a country during a year.
- National Expenditure is the total spending by a country's citizens on g/s produced during a year.
- GNI is the GDP plus factor incomes earned by residents overseas minus factor incomes earned by non-residents in the domestic economy.
- Nominal GDP is the market value of g/s produced in an economy, unadjusted for inflation. (Summation of $P_{current\ year} x\ Q_{current\ year}$)
- Real GDP is nominal GDP adjusted for inflation (relative to base year prices) to reflect changes in real output. (Summation of $P_{base\ year} x\ Q_{current\ year}$)
  N.B. Increase in nominal GDP may not mean increase in SOL (concerned with qty of g/s)

- Ways to calculate GDP:

O/p approach	Expenditure approach	Y approach
- Measures total o/p of final g/s produced by all firms in the economy in a given year - Either consider the value added at each stage OR the value of the final pdt - Shows **different sector's contribution** to total o/p → infer **relative importance** of sectors → guide **policy making** (whether to reskill workers from declining to thriving sectors)	- Measures the expenditure necessary to purchase all the final g/s produced in the economy in a given year - GDP (at market prices) = C + I + G + (X – M) - **One point on AD curve** - Provides insight to **nature of economy** (consumption/ export orientated)→ **dependence on foreign trade**	- Measures the total income generated from the production of goods and services in an economy in a given year. - WRIP - **Does not include transfer payment** - Provide data on **distribution of income** across factor owners → infer **income inequality** - Provide insight to **economy's competitiveness** (decrease labour share of NY, decrease labour cost per unit o/p, increase profitability for firms)

- Uses of NYA:
  1. Measure level of economic activity
     - See if economy is growing, stagnating, or declining
     - Gauge the relative economic strengths of different countries
  2. Guide decision making
     - Government set target for NY → gauge economy's progress and evaluate effectiveness of policies implemented
  3. Measure (material) standard of living (Qty/ Qly)