Glossary (MGT 641)

The focus here is about definitions and notations. There is no attempt to articulate all these concepts into a coherent framework – something to be done during the course and for the projets

Macro-economics

GDP (gross domestic product) (also noted Y below)
A monetary measure of the economy's total output (the value of all the final goods/services produced by the residents of a country) – it measures the size of the economy
Growth of GDP = economic growth
What matters is *GDP/capita or Y/N* = proxy of the wealth of a country = standards of leaving
GDP/capita will be noted y below

5 problems with GDP
*Measures any market transaction ignoring that some (many) are unproductive
*Does not measure activities/services which are freely available while producing large social values
*It is difficult to capture net quality effect on GDP when the considered innovation substitutes to many existing activities which contributed to the total output of the economy (e.g. smartphone)
*Does not account for inequality and wealth distribution within a country
*The key word in GDP is ''gross'' = it does not include the depreciation (or decumulation) of capital

Labour productivity
Ratio between total output Y and the quantity of labour (person-hour). It measures the efficiency of the economy. Productivity growth is key since a country's ability to improve its standard of living (GDP/capita) over time depends almost entirely on its ability to raise its output per worker. Key drivers of productivity growth are innovation, education and capital deepening (the accumulation of manufactured capital)

The fundamental equation about the drivers of prosperity
$Y/N = Y/H \times H/N$ -- with
Y = GDP ; N = total population ; Y/N = wealth of the country ; H = hours of work in the economy ; Y/H = labour productivity; H/N = hours of work per capita
Long-lasting trends : H/N is bounded (social progress) and decreasing ; Y/H (productivity) is unbounded (no limit), is the key driver of Y/N

Sustainability

Global common goods
These are open access resources We don't pay for using such global public goods – e.g. open seas and tropical rain forests. Global common goods are likely to be overused and to suffer from the ''tragedy of the commons'' (see below).

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Externalities

A phenomenon that arises when an individual or a firm takes an action but does not bear all the costs (negative externalities) or receive all the benefits (positive).
In case of a negative effect (e.g. a pollution), if is not compensated (the cost is not internalized), there is an externality and the price of the activity (e.g. flying) does not reflect its total cost – thus there is a market failure because production or consumption decisions are distorded – they don't face the total cost of the activity (hence over production ; over consumption)
Why do we have massive externalities ? Missing markets and market deficiency

Tragedy of the commons

Is a feature of some global commons : they are open access resources and subject to potential depletion : my private utility to capture an additional fish (and other and other) is higher than the social cost of potential depletion (which is borne by society)

Productive base

Society's capital assets and institutions at time t.
The capital assets include :
Manufactured capital
Human capital
Natural capital
Social capital
An economy's productive base declines if the decumulation of assets is not compensated by the accumulation of other assets. Compensation and substitution (e.g. through innovations) are effective to allow a productive base to grow – in spite of certain capital assets decumulation – but only up to a certain point

Capital assets social productivity

The capitalized value of the flow of services an extra unit of the capital asset (for example a local ecsystem) would provide society

Shadow prices

Economists call social productivity of capital assets their shadow prices to distinguish them from prices that are observed in the market. Shadow prices reflect the social scarcities of capital assets.

Sustainable development

This requires that – relative to their population – each generation provides to the next one at least as large productive base as it has itself inherited ; e.g. a development that meets the needs of the present without compromising the ability of future generations to meet their own needs
Productive base can be shrinkening through human activities but nobody will notice it since GDP continues to grow !

The global impact inequality (focus on natural capital)

$Ny/\alpha > G(S)$
N = population ; y = per capita global GDP ; α = the efficiency with which natural resources are converted into goods and services ; Ny/α = agregate demand for natural resources ; G = biosphere net regeneration rate ; S = stock of natural capital ; G is a function of S

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A fundamental distinction
Provisioning goods = food, water, timber, fuels, fibres, pharmaceuticals, non living materials
Maintenance and regulating services = carbon sequestration, nitrogen fixation, nutrient recycling, decomposition of waste, pollination, soil regeneration, purification of water, maintenance of the biosphere's gaseous composition
Most actions to increase α deal with provisioning goods (substitution, efficiency, recycling, management) – ignoring the services.

Microeconomics (see also recommended reading n°4)

Demand curve – the relationship between the quantity demanded and the price, whether for an individual or for the market as a whole. It is determined by the willingness to pay

Price elasticity of demand – the % change in quantity demanded of a good as the result of 1% change in price

Supply curve – the relationship between the quantity supplied of a good and the cost, whether for a single firm or the market as a whole. This is determined by the marginal costs

Willingness to pay – provides a measure of how much a consumer values the new good – e.g. is willing to pay for this good

Marginal cost – the additional cost corresponding to an additional unit of the output produced

Perfect competition – a situation in which each firm is a price taker – it cannot influence the market price; if a firm raises price above the market price, it loses sales because of homogeneity of supply, perfect information of consumers and no collusion or cartel

Competitive equilibrium price – the price at which the quantity supplied and the quantity demanded are equal to each other

Pareto optimality – it is a situation where any change that benefits one person hurts someone else (it says nothing about distributive justice or ethical merit) – alternative definition: Pareto efficiency occurs when it is impossible to make one party better off without making someone worse off

Surplus
Consumer- – the extra-benefit derived from the gap between the willingness to pay and the price
Producer- (or profits) – the extra-benefit derived from the gap between the price and the marginal cost
Total- (or social) – the addition of the two surplus
Total surplus is maximized when price = marginal cost (as a consequence of perfect competition)

Monopoly price – a price made by a monopolist (typically an innovator). It will be above the level at which price equals marginal cost and will allow the firm's profit to be maximised.

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Dead-weight loss – measures the inefficiency of the monopoly

Monopolistic competition – the market is characterized by a certain number of firms – each offering a slightly differentiated version of the same generic product or service. Demand curve of each firm is shifting to the left and price and profit are going down. More entries will tend to make prices closer to the market price, despite product differentiation.

Monopoly rents – the profit earned by a monopolist that results from it reducing output and increasing the price from the level at which price equals marginal cost

Innovation

Product innovation
Introduction of a good or a service that is new or significantly improved. It generates higher diversity of products/services and produce a better matching to various segments of consumers. Uncovered needs are met

Vertical/horizontal differentiation
Product innovation includes differentiation. Within an existing class of products, products with different characteristics and prices are generated. Vertical differentiation involves new higher quality but also new lower quality which implies a lower price (e.g. low cost innovation)

Process innovation
Implementation of a new or significantly improved production or delivery method (includes organizational changes). It can decrease per unit production or delivery costs

Model innovation
Introduction of a new way to organize an activity or of an entirely new activity – combining new product & process and new user experiments

System innovation
Introduction of systemic changes involving the alignment of incentives of various stakeholders, new technologies, infrastructures and services, large scale behavioural changes, etc.. to generate a system-level transformation

Business innovation
A significant fraction of the value of the innovation is expected to be captured by the private innovator (profit)

Social innovation
Most of the value of the innovation go to society

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Public sector innovation
The system innovation is coordinated and organized by the public sector and the value is distributed among stakeholders and society

Soft innovation
Innovation in goods and services that primarily impacts upon sensory perception, aesthetic appeal or intellectual appeal rather than functional performance (e.g. a new book)

Schumpeterian innovation
The origin of the innovation is a technological invention or a scientific discovery

Phelpsian innovation
The origin of the innovation is an (entrepreneurial) idea from someone working in the economy

Disuptive versus sustaining innovation
An innovation is disruptive as it is generated by an outsider and challenges the existing model of activity (e.g. Uber versus taxis)
An innovation is sustaining as it is generated by an incumbent and sustains the existing model of activity (e.g. GPS for the taxis).

Innovation spillovers
The benefits of an innovation spill-over and are not fully captured by the private innovator. For example, a part of the value of the considered innovation is not fully incorporated in market prices and so the benefits spill-over to consumers. Economists categorize spillovers into market, knowledge and inter-temporal spillovers. Spillovers have ambivalent effects : they are good for society (as in the example above) but bad for the innovator who then will be tempted to minimize her innovation efforts. Ambivalent effects of spillovers are a manifestation of the conflict between static (lower price) and dynamic (lower incentives to innovate) efficiencies.

Market failure
The situation in which a market economy fails to attain economic efficiency. Typical sources of market failures in the case of innovation involve spillovers (externalities), capital market failure, situations where the fixed costs are high (e.g. R&D fixed costs) and marginal costs are negligible, and information failures

Appropriability
The ability of the private innovator to capture a large fraction of the value of innovation (and therefore minimize innovation spillovers). Mechanisms supporting appropriability are numerous – including most importantly intellectual property rights

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Recommended readings

Week 1
P.Dasgupta - *Economic growth in the Anthropocene* – Capitalism and Society – 2024

J. Buggle and J.P. Danthine – *How neoclassical economics can pave the way for a circular economy* – IMD - 2021

Week 2
B.Jones – *Where innovation happens and where it does not* – National Bureau of Economic Research - 2022

Week 3
D.Foray – *Microeconomics (introduction)* – draft - 2023

Week 4
Wanzenbroek et al. – *A framework for mission-oriented innovation policy* – Science and Public Policy - 2020

Week 5
G.Hardin – *The tragedy of the commons* – Science - 1968

T.Helbling – *What are externalities ?* – International Monetary Funds – 2010

H.Nilsson and D.Robinson – *What is the business of business ?* – National Bureau of Economic Research - 2017

Week 6
M.Kremer and H.Williams – *Promoting innovation to solve global challenges* – The German Marshall Fund – 2008

M.Kremer and H.Williams – *Incentivizing Innovation : adding to the toolkit* – Journal of Economic Perspectives – 2010

K. Nyborg et al – *Social norms as solutions* – Science – 2016

Week 7
B.Cornet and D.Foray – *New financial engineering tools to address grand challenges* – draft - 2024

Week 8
M.Mazzucato and D.Rodrik – *Industrial policy with conditionalities* – IIPP - 2023

D.Rodrik – *Green industrial policy* – Oxford Review of Economic Policy – 2014

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