

Macroeconomics I. – Supplementary Materials

Price Development and Related Concepts

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Basic Concepts

Part I

Price Development in General

- **Price development is one of the economic variables that affects the life of every economic entity on a daily basis**
- **Price changes are usually recognisable very fast**
 - Depending on the frequency of purchases (necessities x services and durable goods)
 - On the other hand, for example, exchange rate movements or changes in the unemployment rate are more hidden and may not be apparent at the first glance, but it may be the factor that has led to price changes
- **Price movement, respectively changes in relative prices reflect imbalance(s) existing in the analysed economy at a given point in time or may be a legacy of the past**

Price Development in General

- **Price development is dependent on local/regional and general economic conditions**
 - I.e. competition level in the locality, the extent of public sector intervention (taxes and subsidies), phases of economic cycle in the whole economy, ...
- **Low inflation (along with low unemployment) are key economic policy objectives**
 - Short run: policymakers may try to expand aggregate demand (using monetary or fiscal policy) – output and inflation rate increase (while decreasing unemployment)

Inflation

- **Basic indicator:** rate of price change (in general) or **inflation rate**
- **Inflation** = continuous, usually long-term growth, of aggregate (general) price level monitored through the development of a certain price index
 - However, structural developments in sub-items may be different (some may decline, other grow etc.)
- **Short-term fluctuations in individual prices usually take place on a daily basis, i.e. relative price ratios (relative prices) vary, and these partial changes may be mutually offset**
 - However, the trend should be clear when talking about inflation

Inflation

- The relative price structure in the economy reflects the **structural characteristics** in the economy and consequently affects the consumption and production behaviour of the entities
 - Temporary changes resulting from different types of exogenous (or one-off) shocks
 - Changes reflecting structural changes of longer-term nature (household consumption patterns, changes in the markets of production factors and inputs, new technologies, ...)

Disinflation, Stagflation, Slumpflation, Deflation

Disinflation

- It is a process of slowing down the rate of growth of the price level
 - = lowering the inflation rate
 - For example, in the Czech Republic we can speak of disinflation when the inflation rate decreased from 10.7% in 1998 to 2.1% in 1999

Stagflation and Slumpflation

- It is a combination of inflation and stagnation – respectively no change (stagflation) or decline (slumpflation) in real GDP and rise in unemployment rate

Disinflation, Stagflation, Slumpflation, Deflation

Deflation

- A situation when the price level is falling (negative price changes)
- **Broad definition with two main aspects:**
 - Long-term decline in the price level measured by a certain price index
 - Linked with changes in the inflation expectations of economic agents
- Deflation has been and is usually observed in periods of economic slowdown (recession, depression)
- However, a fitting structural deflation may be a good sign for an economy
 - E.g. working price competition – lower prices; lower prices of inputs

Selected Types of Inflation

Part II

Selected Types of Inflation

- **Long term:** price movements in the economy are very closely linked to **money supply**
- **Short term:** more complicated relationships, **various divisions**
 - *However, it is very difficult to identify all the factors*

A. Primary causes of price movements

1) Supply inflation

- **Monopoly power inflation** (profit oriented)
 - High prices (monopolistic or oligopolistic structures – high profit margins)

Selected Types of Inflation

A. Primary causes of price movements (continued)

1) Supply inflation (continued)

- **Wage inflation**

- Wage pressures (trade unions or deflation vs. lacking productivity)

- **Imported inflation**

- In the case of a fixed exchange rate and a price growth of imported goods and services

- **Regulatory inflation**

- The impact of administrative (economic-political) measures

Selected Types of Inflation

A. Primary causes of price movements (continued)

2) Demand inflation

- Individual components of aggregate demand
- Or monetary expansion (excessive growth in monetary and credit aggregates in the economy)
 - In the case of money supply growth, it is important how the velocity of money can react, which can “neutralize” inflationary issues, as has been the case in non-standard monetary measures in recent years (quantitative easing)

Selected Types of Inflation

B. The magnitude of inflation

1) Moderate inflation (or creeping inflation)

- Single-digit inflation – generally up to 10%
- Usually not a problem

2) Galloping inflation

- Inflation higher than 10%
- This type is already leading to changes in the behaviour of economic agents and is associated with negative impacts on economic growth

Selected Types of Inflation

B. The magnitude of inflation (continued)

3) Hyperinflation

- Inflation higher than 100%
- The money stops to function -> use of foreign currencies or barter exchange
- Examples: Weimar Republic (Germany) in 1920s, Hungary after the WWII, Yugoslavia at the end of the last century, or in Zimbabwe since 2007

Determinants of Price Changes

Part III

Long Run Determinants of Price Changes

*“Inflation is always and everywhere a monetary phenomenon”
(M. Friedman)*

- **Quantity theory of money** is the general theory of inflation

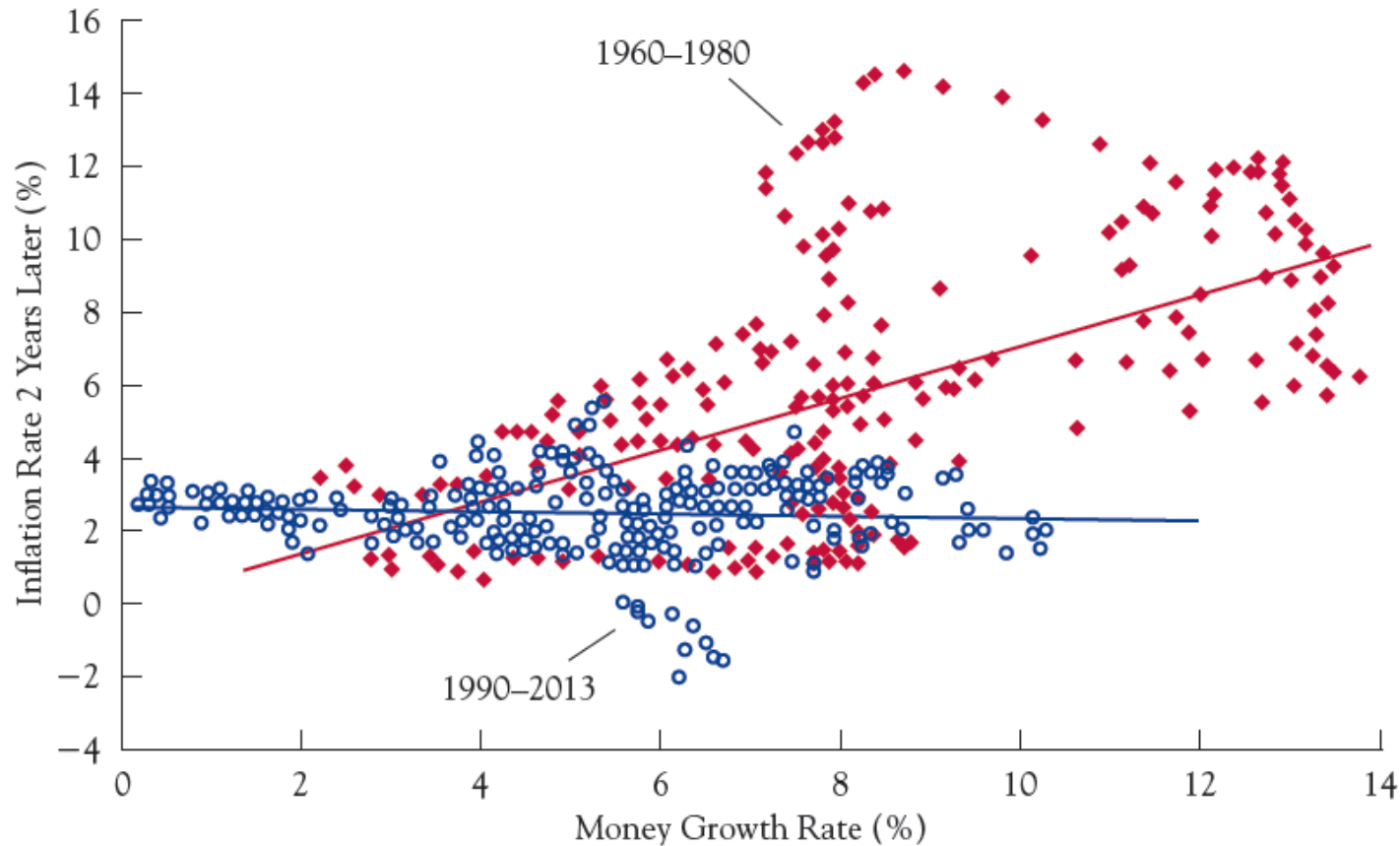
$$P = \frac{M * V}{Y}$$

Approximation: $\Delta p \text{ or } \pi = \Delta m + \Delta v - \Delta y$

M: monetary aggregate; P: prices; Y: output; V: velocity of money

- **Constant velocity and money neutrality -> inflation follows money growth**
 - In the long run, periods of hyperinflation
 - Less so in the short run in normal times

Correlation between Money Growth and Inflation



Data source: Georgiou (2014) –

https://www.researchgate.net/publication/291822240_International_Banking_and_Trade_Financing/figures

Short Run Determinants of Price Changes

- **Selected short run determinants of inflation (or price changes):**
- **Past inflation (hysteresis)** – “internal” inflation persistency
- **Domestic demand and supply pressures**
 - Business cycle factors (Phillips curve)
 - Market structure
- **Administrative measures**
 - Indirect taxes (VAT, Excise taxes, tariffs, etc.)
 - Price floors or ceilings (minimum, maximum price)
 - Other regulated prices – public transport, parking fees, parts of energy prices, ...

Short Run Determinants of Price Changes

— External factors, spillovers

- Import prices
- Commodity prices
- Exchange rate movements

— Inflation expectations

- For example, producers may anticipate higher prices of outputs and set higher prices of final products; Also, key factor for wage negotiations etc.

Short Run Determinants of Price Changes

– Inflation expectations (continued)

- **May help stabilise inflation, but can also destabilise it**
 - Even temporary shocks can have long-lasting effects on inflation
- **Are determined by:**
 - Credibility of monetary and fiscal policy ($\pi_t^e = \pi^T$)
 - Recent inflation – adaptive expectations ($\pi_t^e = \pi_{t-1}$)
 - Long-run trend – “natural” level of inflation
- **Are not observable → Surveys**
 - Households, businesses, official forecasters and market analysts

Centrally Planned Economy

- **Price growth was constrained by a number of administrative measures** and only to a limited extent due to supply and demand interactions
- Insufficient production against purchasing demand led to the creation of so-called **forced savings** (or due to the rise in prices on the black market), as the purchase of foreign currencies and possible imports was severely limited
 - So we should not speak about the price level, but a kind of quasi-price level

Centrally Planned Economy

- **These forced savings have become a major problem in the context of a transition from a command-driven economy to a market-based economy**

 - In the absence of administrative measures, their immediate conversion into foreign currencies, respectively efforts to spend it would have led to a rapid depletion of foreign exchange reserves and a deep current account deficit
 - Therefore, the transformation scenarios were based on limited national currency convertibility
- **In reality, however, CPE prices rose and were artificially subsidised by a system of surcharges and deductions for individual goods and services, depending on the sensitivity of their price movements to public opinion**

Selected Price Indices

Part IV

Selected Price Indices

1. Aggregate price index

- GDP Deflator

2. Disaggregated price indices, selected groups:

- Consumer Price Index (CPI) and its derivatives
 - EU: Harmonised Index of Consumer Prices (HICP)
- Producer Price Indices (PPIs)
- Import and export price indices

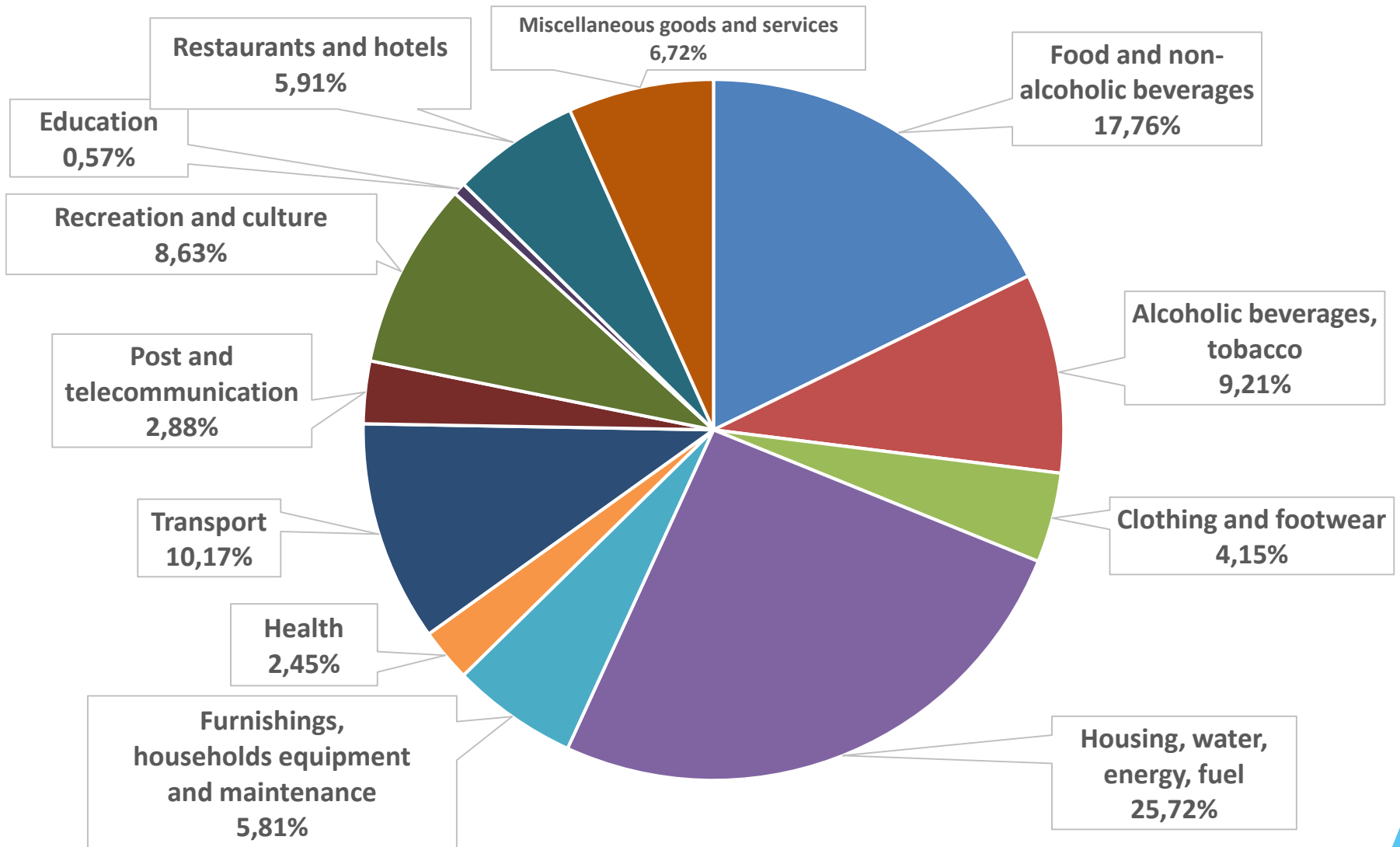
GDP Deflator

- **The most comprehensive indicator of price level development**
 - **Aggregated index** measuring the development of the general (overall) price level because it contains all goods and services **produced** in and **imported** into the economy
- **Deflator is not an output obtained from National accounts**
 - In fact, it is an input, National Accounts are constructed using current prices
 - It is obtained from various surveys and subsequently used as an input
 - Various methods of calculations

Consumer Price Index (CPI)

- The most widely used price index
- **It monitors the development of consumer prices (cost of living) using a consumer basket based on a set of selected goods and services paid for by the population in a given economy**
 - The products and services that significantly contribute to the population's expenditures and which approximately cover the whole consumption are chosen as **price representatives**
 - **Note:** Czech Statistical Office – 2019 data: the total number of price representatives is 693 (year 2016) and the sample is aggregated into 12 main sections of the consumer basket

Structure of Czech Consumer (Price) Basket (CZSO, 2019)



Harmonised Index of Consumer Prices (HICP)

- **Published by Eurostat, focusing on European Union countries**
 - However, it also includes EEA countries (Norway, Lichtenstein, Iceland), the UK, Switzerland, Turkey, North Macedonia, Serbia, and the USA
- **It is compiled from national CPIs**
 - Price weights are also obtained from household budget surveys and cross-checked and updated with information from other sources (e.g. VAT revenue statistics and national accounts – household final monetary consumption expenditure)
 - Slightly different composition of consumer basket of goods and services between countries

Harmonised Index of Consumer Prices (HICP)

- **EU-wide harmonisation**
- It covers the **expenditure of all households within a country's economic territory**

Harmonised Index of Consumer Prices (HICP)

- > **1.2. HICP - FOOD AND NON-ALCOHOLIC BEVERAGES**
- > **1.3. HICP - ALCOHOLIC BEVERAGES, TOBACCO**
- > **1.4. HICP - CLOTHING AND FOOTWEAR**
- > **1.5. HICP - HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS**
- > **1.6. HICP - FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSE MAINTENANCE**
- > **1.7. HICP - HEALTH**
- > **1.8. HICP - TRANSPORT**
- > **1.9. HICP - COMMUNICATION**
- > **1.10. HICP - RECREATION AND CULTURE**
- > **1.11. HICP - EDUCATION**
- > **1.12. HICP - RESTAURANTS AND HOTELS**
- > **1.13. HICP - MISCELLANEOUS GOODS AND SERVICES**

Source: Eurostat (2020) – <https://ec.europa.eu/eurostat>

Producer Price (Sectoral) Indices

- In addition to the growth rate of prices of final goods and services, various indices measuring the development of prices in individual sectors of the economy are monitored
 - Examples: industrial producer prices, prices of construction work, prices of market services, prices of agricultural products, etc.
 - *Prices of inputs may be approximated by the Industrial Producer Price Indices (PPI is the overall change aggregating all the sectors)*
 - *The PPI does not include imports, because imports are by definition not produced by domestic firms (but it does include exports)*

Import and Export Price Indices

- **Foreign or international trade prices are an integral part of price statistics in each economy as they are used to calculate real GDP**
- **Czech Republic:**
 - Data obtained from surveys conducted in manufacturing and foreign trade companies (approximately 600 companies)
 - The prices do not include tariffs, VAT or excise duties
- **Used classifications:**
 - The Harmonized Commodity Description and Coding System, also known as the Harmonized System (HS)
 - Standard International Trade Classification (SITC)
 - The Statistical classification of products by activity (CPA)

Consequences of Inflation

Part V

Consequences of Inflation

- Increased uncertainty associated with price movements is connected to additional costs which can be very significant (menu costs, accounting costs, tax costs, ...)
- **Unexpected (unanticipated) changes lead to the redistribution of wealth among the various economic entities in society**
- Otherwise, they can deal with it – calculate it in prices, valorise pensions, make better investment evaluations, etc.)
- -> **preference of short term horizons (less profitable investment projects), increase in risk premium when borrowing funds, etc.**

Consequences of Inflation

- In addition, Inflation changes the position of exporters and importers of the economy, as it affects the real exchange rate of the currency and thus the competitiveness of their products on the markets
 - The effects are unclear, dependent on an economy in a given point in time

Consequences of Inflation

Main issues:

- The level of inflation
- Variability of inflation
- Unbalanced inflation – having different impacts on different groups of individuals
- The incidence of impacts on economic growth (case-specific)

— Empirical studies:

- Low values (moderate inflation): rather positive consequences for economic growth
- Higher inflation rates (and especially its variability): detrimental to economic growth



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