This article focuses primarily on price levels of investment in the European Union (EU) Member States, covering also three EFTA countries (Iceland, Norway and Switzerland), as well as five EU candidate countries (Albania, Montenegro, North Macedonia, Serbia and Turkey), and a potential candidate country - Bosnia and Herzegovina.

Overview

In 2018, the highest price levels for investment among the EU Member States were observed in Finland at 31 % above the EU average, while in the least expensive EU Member State, Romania, the price level was 35 % below the EU average. These are the main conclusions drawn from the results of two price surveys carried out in 2018 within the Eurostat - OECD Purchasing Power Parities (PPP) Programme. The two surveys cover construction (residential buildings, non-residential buildings and civil engineering works) and machinery, equipment and other products.

The results of the surveys are expressed in price level indices (PLIs), which provide a comparison of countries’ price levels with respect to the EU average.

Figure 1 shows the 2018 PLIs for total investment. Norway, Iceland, Finland and Switzerland record the highest price levels for investments, with PLIs of 146, 135, 131 and 130, respectively. At the other end of the spectrum, the least expensive countries for investment are Turkey, North Macedonia and Albania, with PLIs of 49, 55 and 60.
Figure 1: Price level indices for investment, 2018, (EU-28=100) - Source: Eurostat (prc_ppp_ind)

Machinery, equipment and other products

Figure 2 shows the PLIs for machinery and equipment, including metal products and equipment, electrical and optical equipment and transport equipment (see classification of investment products used). The most expensive countries for machinery, equipment and other products are Iceland, Norway, Denmark and Malta with respective PLIs of 127, 126, 118 and 118, while Turkey, Poland and Hungary are the least expensive countries, with respective PLIs of 80, 90 and 92. The main characteristic shown by this chart is that the price levels for this type of product are relatively homogeneous across countries.

Figure 2: Price level indices for machinery and equipment, 2018, (EU-28=100) - Source: Eurostat (prc_ppp_ind)

Table 1 shows the countries’ PLIs for the aggregate machinery and equipment as well as for its three main sub-categories: metal products and equipment, electrical and optical equipment and transport equipment. In addition, the PLIs for software are shown. Countries are sorted according to their overall price level for investment shown in the first column. The shaded fields indicate the highest and lowest PLIs per category among all 37 participating countries. The highest and lowest PLIs among the 28 EU Member States are marked in bold.

Comparative price levels for investment

2
Table 1: Price level indices for machinery, equipment and software, 2018, (EU-28=100) - Source: Eurostat (prc_ppp_ind)

The results show that Denmark and Malta are the most expensive EU Member States for total machinery and equipment. Denmark is the most expensive EU Member State for two sub-categories: metal products and equipment; and transport equipment. Among the EU Member States, Malta shows the highest prices for electrical and optical equipment. Finally, Lithuania is the most expensive EU Member State for software.

On the other hand, Poland is the least expensive EU Member State for total machinery and equipment, as well as for the three main sub-categories: metal products and equipment; electrical and optical equipment; and transport equipment. Belgium and Croatia are the least expensive EU Member States for software.

Among all 37 countries, Iceland is the most expensive country for total machinery and equipment. Iceland has the highest price level for metal products and equipment and for electrical and optical equipment. Norway has the highest price level for transport equipment, while Lithuania has the highest prices for software.

Turkey is the least expensive country for total machinery and equipment when taking into account all 37 countries. Turkey has as well the lowest price levels in all three main sub-categories: for metal products and equipment, for electrical and optical equipment, and for transport equipment. Turkey is also the least expensive country for software.

At the bottom of the table, variation coefficients are provided for the euro area (EA-19), the European Union (EU-28) and the group of all countries participating in the program (All 37). The variation coefficient is defined as the standard deviation of the PLIs of the respective group of countries as percentage of their average PLI. The higher the variation coefficient, the higher is the price dispersion in the respective category.

The variation coefficients at the bottom of Table 1 confirm the relatively low price dispersion across countries for these investment products. The highest homogeneity is visible within the euro area. Among all 37 countries, software shows the lowest price variation and transport equipment the highest price variation across countries.
Construction

Figure 3 presents the PLIs for construction. The most expensive countries for construction investment are Switzerland, Norway, Iceland and Sweden with PLIs of 168, 155, 149 and 149 respectively. On the other hand Turkey, North Macedonia, Bosnia and Herzegovina, Albania, Romania and Serbia are the least expensive countries for investment in construction, showing price levels under 50% of the EU average. The lowest construction price levels were observed in Turkey, with a PLI of 34.

Figure 3: Price level indices for construction, 2018, (EU-28=100)- Source: Eurostat (prc_ppp_ind)

Table 2 shows the PLIs for the main categories of construction expenditure (residential buildings, non-residential buildings and civil engineering works). Countries are sorted according to their overall price level for investment shown in the first column. As in Table 1, the shaded fields indicate the highest and lowest PLIs per category among all 37 participating countries. The highest and lowest PLIs among the 28 EU Member States are marked in bold.

Figure 3: Price level indices for construction, 2018, (EU-28=100)- Source: Eurostat (prc_ppp_ind)
Table 2: Price level indices for construction and its components, 2018, (EU-28=100) - Source: Eurostat (prc_ppp_ind)

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<tr>
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Notes: Countries are sorted according to their overall price level for investment shown in the first column. The shaded fields indicate the highest and lowest PLIs per category among all 37 participating countries. The highest and lowest PLIs among the 28 EU Member States are marked in bold.

Source: Eurostat (online data code: prc_ppp_ind)

Sweden is the most expensive EU Member State for all construction sub-categories, except for civil engineering works, for which Finland has a higher price level. At the other end of the spectrum, the least expensive EU Member State for construction investments is Romania, showing the lowest PLIs for all main sub-categories.

Among all 37 countries, Switzerland has the highest price levels for overall construction and for the sub-category residential buildings. Norway is the most expensive for non-residential buildings and Finland the most expensive for civil engineering works. The lowest price levels for residential and non-residential buildings were observed in Turkey. For civil engineering works, Bosnia and Herzegovina had the lowest price level.

Price dispersion is higher within the 37-country group. It is much less significant in the euro area (EA-19) than in the EU as a whole. Price dispersion for all categories of construction is higher than that for total investment, due to the higher share of labour input into construction and the high dispersion of wages across countries. Price dispersion is the highest for residential buildings, followed by non-residential buildings.

Data sources

The data in this article are produced by the Eurostat-OECD Purchasing Power Parities (PPP) Programme. The full methodology used in the programme is described in the Eurostat-OECD Methodological manual on purchasing power parities available free of charge from the Eurostat website.

The PPP concept
In their simplest form PPPs are nothing more than price relatives that show the ratio of the prices in national currencies for the same good or service in different countries. For example, if the price of a hamburger in France is EUR 2.84 and in the United Kingdom it is GBP 2.20, the PPP for hamburgers between France and the United Kingdom is EUR 2.84 to GBP 2.20 or EUR 1.29 to the pound. In other words, for every pound spent on hamburgers in the United Kingdom, EUR 1.29 would have to be spent in France in order to obtain the same quantity and quality – or volume – of hamburgers.

Published PPPs usually refer to product groups or broad aggregates like gross domestic product (GDP) rather than to individual products. However, these aggregate PPPs are based on data for individual goods and services.

**Price level indices**

Price levels as presented in this publication are the ratios of PPPs to exchange rates. They provide a measure of the differences in price levels between countries by indicating for a given product group the number of units of common currency needed to buy the same volume of the product group or aggregate in each country.

Price level indices (PLIs) provide a comparison of the countries’ price levels relative to the European Union average: if the price level index is higher than 100, the country concerned is relatively expensive compared to the EU average, while if the price level index is lower than 100, then the country is relatively inexpensive compared to the EU average. The EU average is calculated as the weighted average of the national PLIs, weighted with expenditures from national accounts, corrected for price level differences.

Price level indices are not intended to rank countries strictly. In fact, they only provide an indication of the order of magnitude of the price level in one country in relation to others, particularly when countries are clustered around a very narrow range of outcomes. The degree of uncertainty associated with the basic price data and the methods used for compiling PPPs may cause minor differences between the PLIs and result in differences in ranking which are not statistically or economically significant.

**The impact of exchange rate changes on PLIs**

As explained above, the PLI for a given country is calculated as its PPP divided by its annual average exchange rate to the euro. This implies that exchange rate movements have an impact on the PLIs. The depreciation of a country’s currency against the euro will make the country less expensive in comparison to euro area countries and this will be shown as decrease of the relative price level expressed in the PLI.

In 2018, an example is Turkey with a currency depreciation of 39% between 2017 and 2018 (in terms of annual average exchange rate to the euro). This can explain the fall of the Turkish PLI for investment (from 55 to 49) compared to previously published data for 2017.

**Main characteristics of the survey on prices for machinery, equipment and other products**

The survey on prices for machinery, equipment and other products is carried out every 2 years. The last survey was carried out in April, May and June 2017. Countries collected prices for around 500 items, divided over nine sub-groups. The survey covers the three main sub-categories of machinery and equipment (metal products and equipment; electrical and optical equipment; and transport equipment) as well as the software category.

From the sub-groups listed as investment categories, no prices are collected for other transport equipment, boats, steamers, tugs, floating platforms and rigs, locomotives, rail-cars, vans, wagons and other rail equipment, aircrafts, helicopters, hovercrafts and other aeronautical equipment, and products of agriculture, forestry and other products. PLIs for these sub-groups are estimated taking PPPs of other sub-groups as proxy.

Prices refer to purchasers’ prices including non-deductible VAT.

**Main characteristics of the survey on construction prices**

The 2018 survey on construction prices, whose results are published in this article, was carried out in three months - May, June and July 2018.

Countries collected prices for a list of "bills of quantities", which are comparable construction projects such as a detached house, an office building or an asphalt road. Each bill of quantities consists of a number of chapters
or major components (like earthworks, concrete, masonry, etc.) which are made up of items or elementary
components (like excavation of the terrain, dumping and compacting of soil, etc.).

The construction projects are divided into 3 sub-categories: residential buildings (comprising 4 bills of quanti-
ties: a detached house, a house representative for Portugal, a house representative for Nordic countries and an
apartment building), non-residential buildings (comprising 2 bills of quantities: a light industrial building and
an office building) and civil engineering works (also 2 bills of quantities: an asphalt road and a bridge).

Countries are asked to collect purchasers’ prices for the bills of quantities, i.e. prices actually paid in mar-
kets for the elementary components that make up those bills of quantities and the additional expenses incurred
that build up to the project total cost paid by the client. Non-deductible VAT is added to these purchasers’
prices.

Context

Purchasing power parities (PPPs) are indicators of price level differences across countries. PPPs tell us how
many currency units a given quantity of goods and services costs in different countries. PPPs can thus be used
as currency conversion rates to convert expenditures expressed in national currencies into an artificial common
currency, the purchasing power standard , eliminating the effect of price level differences across countries.

The main use of PPPs is to convert national accounts aggregates, like the gross domestic product (GDP)
of different countries, into comparable volume aggregates. Applying nominal exchange rates in this process
would overestimate the GDP of countries with high price levels relative to countries with low price levels. The
use of PPPs ensures that the GDP of all countries is valued at a uniform price level and thus reflects only
differences in the actual volume of the economy.

PPPs are also applied in analyses of relative price levels across countries. For this purpose, the PPPs are
divided by the current nominal exchange rate to obtain a price level index (PLI) which expresses the price level
of a given country relative to another, or relative to a group of countries like the EU-28.

The common rules for the provision of input data, and for the calculation and dissemination of PPPs, are
2007.

Other articles

• Comparative price levels for food, beverages and tobacco
• Comparative price levels of consumer goods and services
• GDP per capita, consumption per capita and price level indices

Main tables

• Purchasing power parities (PPPs) , see:

Comparative price levels (tec00120)

Price and volume convergence between EU Member States (tec00121)

GDP per capita in PPS (tec00114)
Database

- Purchasing power parities, see:

  Purchasing power parities (PPPs), price level indices and real expenditures for ESA 2010 aggregates (prc_ppp_ind)
  Convergence indicators (prc_ppp_conv)

Dedicated section

- Purchasing power parities (PPPs)

Methodology

- Eurostat-OECD Methodological manual on purchasing power parities
- Purchasing power parities (ESMS metadata file — prc_ppp_esms)

Legislation

- Regulation (EC) No 1445/2007 of 11 December 2007 establishing common rules for the provision of basic information on Purchasing Power Parities and for their calculation and dissemination

External links

- OECD - Purchasing Power Parities (PPP) Statistics
- World Bank - International Comparison Program (ICP)