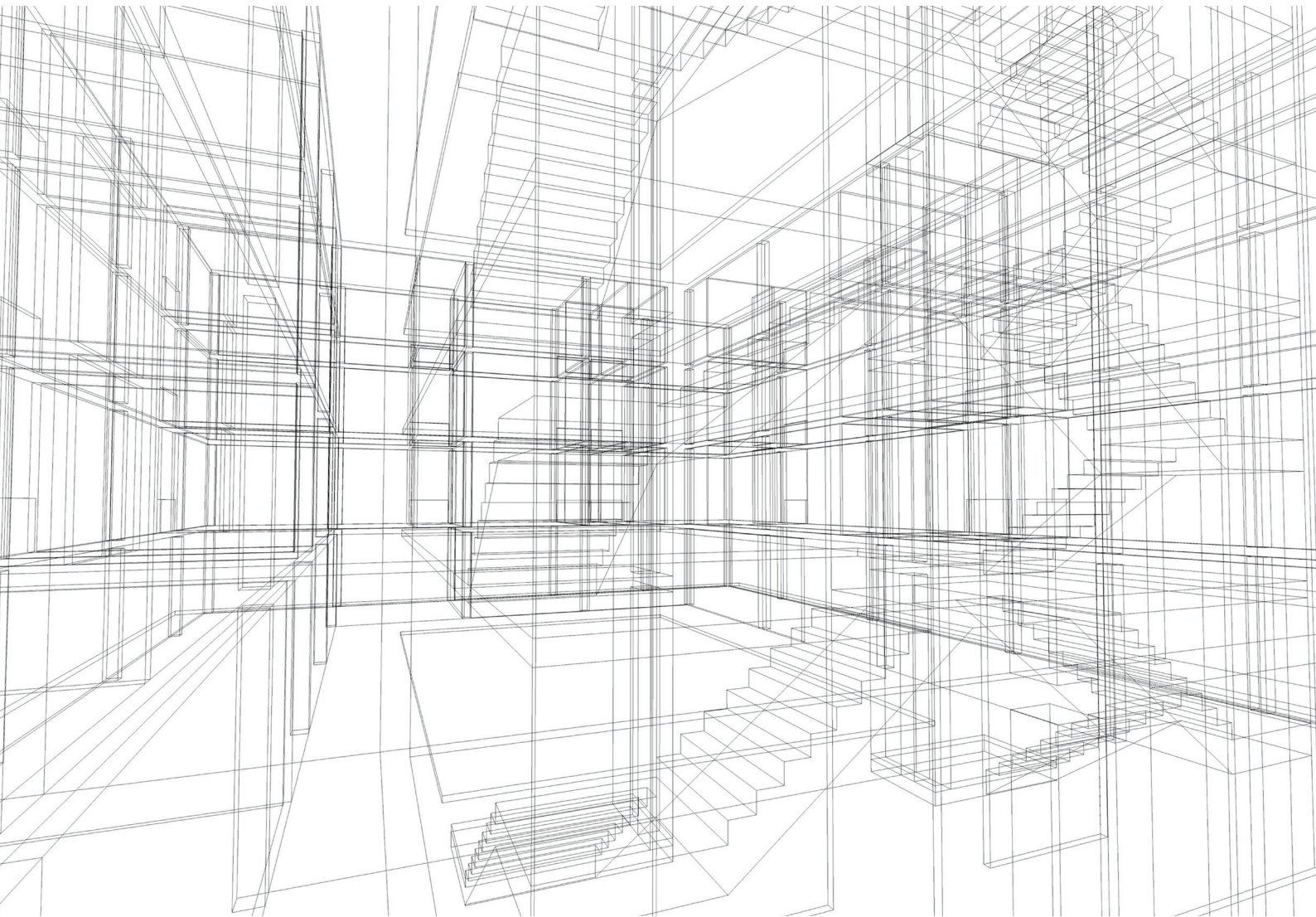


# BCIS<sup>®</sup>

**BCIS<sup>®</sup>** guide to:

## The use of inflation indices in civil engineering

COPI, IOPI, Baxter, RPI and the rest ...



## 1. Introduction

Large civil engineering projects tend to take a long time to plan and build, maintenance and framework agreements and the like tend to be for extended periods and regulatory periods for infrastructure sectors are generally for five years or more.

So dealing with inflation during the planning, construction and maintenance of infrastructure projects is an important issue. The normal means of adjusting for inflation is by use of an index.

The objective of this paper is to look at the types of indices available, the mechanisms used to adjust for inflation for different purposes, and to provide some guidance on choosing the right index.

## 2. What do indices measure?

Four types of index are widely used in construction:

- Resource cost indices
- Tender price indices
- Output price indices
- General inflation indices

**Resource cost indices:** measure the movement in the cost of inputs to the construction industry as a whole. They are usually based on factory gate prices for materials and nationally agreed wage awards and on costs for labour. Examples are the Price Adjustment Formulae (Baxter) Indices, the BCIS General Civil Engineering Costs Index (GCECI) and the Department of Business Innovation and

Skills (BIS) Resource Cost Index of Infrastructure (FOCOS).

**Tender price indices:** measure the movement in the prices charged by contractors agreed at the start of a contract. Examples are the BCIS All-in Tender Price Index and the BIS Tender Price Index of Roads Construction.

**Output price indices:** measure the movement in prices paid to contractors when work is carried out. Examples are BIS/ONS Output Price Index for New Construction: All New Construction (COPI) and BIS Output Price Index for New Construction: Infrastructure IOPI.

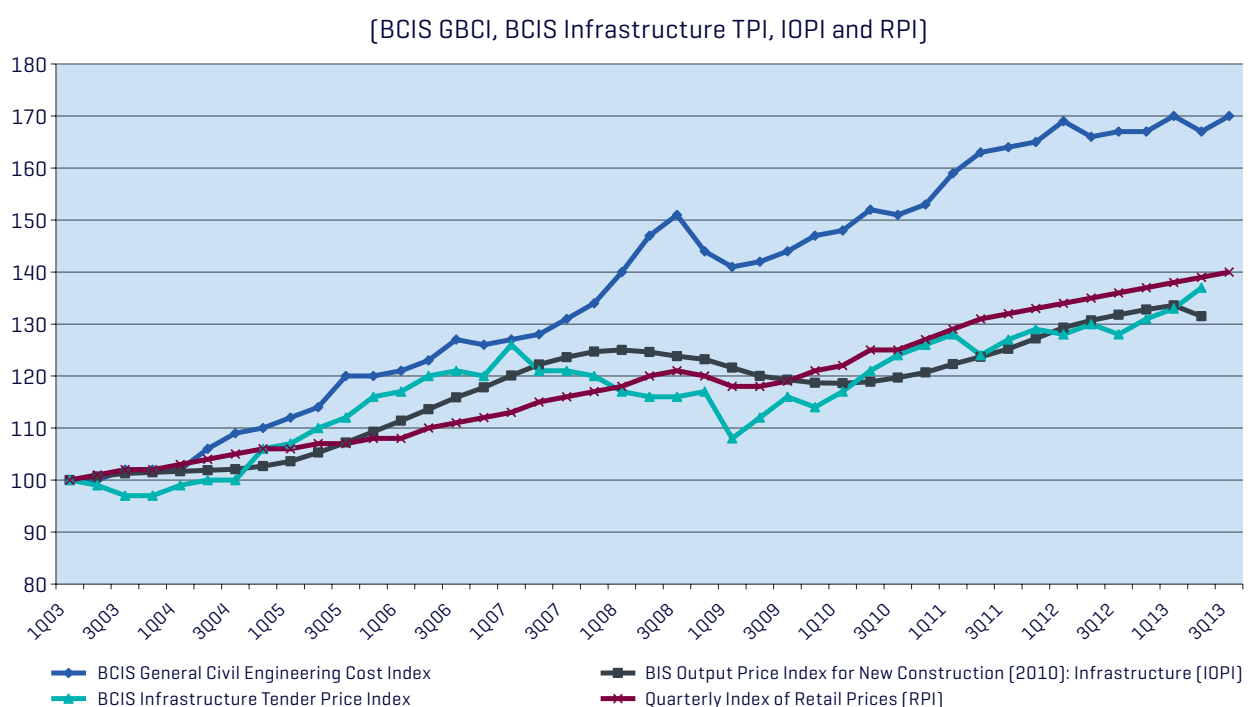
**General inflation indices:** measure the movement in prices experienced by individuals. Examples are Retail Prices Index (RPI) and the Consumer Prices Index (CPI).

The different types of indices tend to move differently. While resource cost indices and general inflation indices may fall occasionally they tend to move upward as they reflect the costs of products and wage awards. The tender price and output price indices react to demand pull as much as to cost push and are therefore much more volatile. The output price indices tend to lag the tender price indices. (see Graph A).

**RPI and CPI:** The RPI and CPI cover slightly different range of goods and services but because of the way they are calculated for the same range of goods and services the RPI will always go up faster than the CPI.

**Cost and price:** The terms 'cost' and 'price' are interchangeable: a seller's price is the same as buyer's price. The BCIS convention is to refer to value of things that the construction industry buys as 'costs' and the value of the things that clients buy as 'prices'.

**Graph A: Resource costs, tender prices, output prices and general inflation**



## 3. What are indices used for?

There are three main uses for indices:

- Updating costs in a cost plan or estimate
- Bringing costs to a common date for benchmarking
- Adjusting prices in a contract where the client is taking all or part of the risk of inflation.

**Updating costs in a cost plan or estimate:** Estimates need to be updated during the pre-construction phase of a project, particularly on larger projects where planning feasibility, planning and design can take many years.

**Example:** On HS2 estimates for sections are prepared at a given base date, the BCIS TPI is used for benchmarking at a common date. For escalation forecasts HS2 use tender price index forecasts up to award dates and then a tailored basket of the civil engineering price adjustment formula indices are projected to cover inflation during construction.

**Bringing costs to a common date for benchmarking:** Using benchmarks for order of cost estimates, challenging or validating estimates, or tracking performance requires historic project costs to be brought to a common date.

**Example:** The Cabinet Office/Infrastructure UK Cost Benchmarks are published as a 2009/10 baseline benchmarks. For later years the benchmarks achieved are adjusted for inflation to allow sensible comparison. The departments involved have used different indices to adjust for inflation. For infrastructure the Highways Agency benchmarks have been adjusted using the BIS Tender Price Index of Roads Construction (ROADCON); Transport

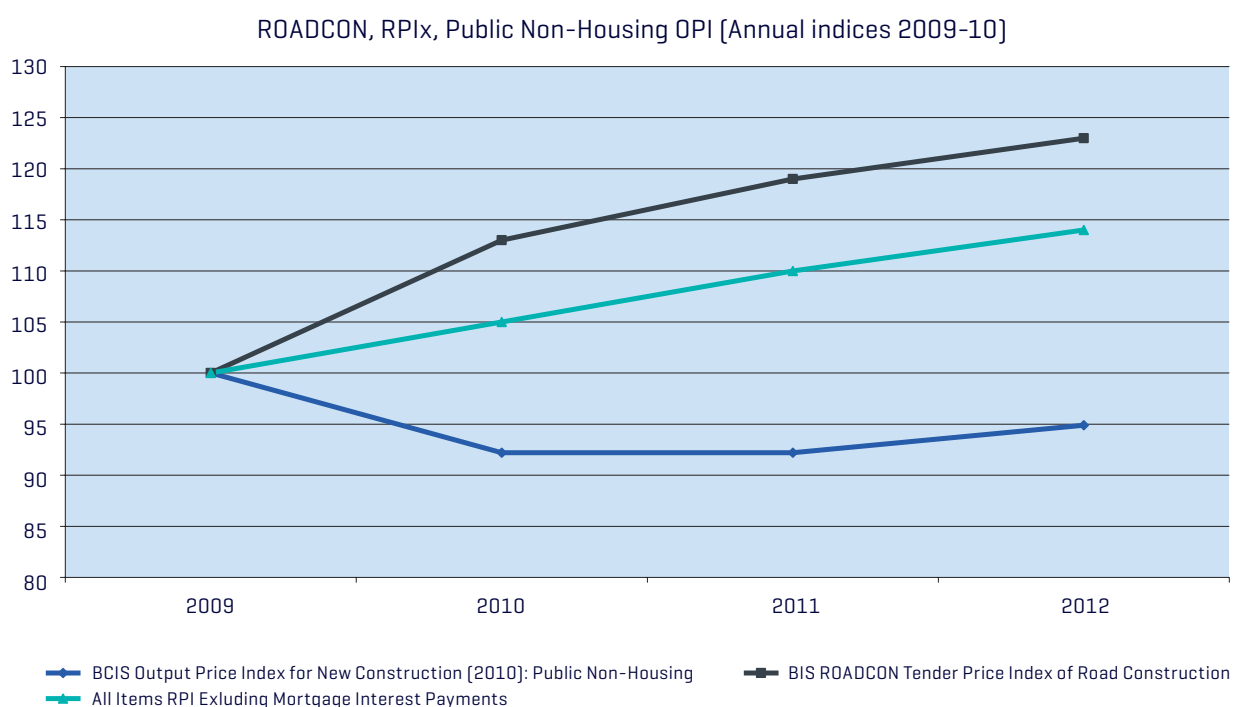
for London have used the Retail Prices Index excluding mortgage payment (RPIx); while the Environment Agency benchmarks have been adjusted using the BIS Output Price Index for New Construction (2010): Public Non-Housing. Does a choice of index make a difference? Looking at these three indices over the period in Graph B suggests it does.

**Adjusting prices in a contract or agreement:** Where a client or funder wishes to take on or share the risk of inflation over the period of the contract; the contract sum, target cost, capital funding allowance, etc. will be linked to and adjusted by an index. The Price Adjustment Formulae Indices have been designed for this purpose but other indices or combination of indices are also used, some times inexplicably!

**Example 1:** On Crossrail NEC contracts with a price fluctuations clause (X1) the target cost is adjusted for inflation using the Price Adjustment Formulae Indices. Each contract has a different mix of the indices modelled to what works are being delivered. The PAFI are loaded into the models to calculate the price adjustment in each period. The indices used are BCIS Cost Indices, Price Adjustment Formulae Indices Building Series 3, Price Adjustment Formulae Indices Civil Engineering 1990 Series, Price Adjustment Formulae Indices Specialist Engineering Series 3. The value of the contracts covered by the index linking is approximately £1.2bn.

**Example 2:** OFWAT capital expenditure requirements are index linked for inflation during the current AMP period (2009-2015) to the BIS/ONS Output Price Index for New Construction: All New Construction (COPI).

**Graph B: Roads Tender Prices, Public non-housing Output prices and Retail prices**



## 4. Six rules for choosing an index

- 1) Be clear about what you want to measure and how you want to apply it.
- 2) Choose an index that is measuring the costs that most closely match 1).
- 3) If you are using the index linking something in a contract or agreement be clear that it meets your needs, particularly in respect of:
  - frequency of the publication (monthly, quarterly, annual)
  - updating and revisions policy
- 4) Understand the inputs to the index and the calculation methodology.
- 5) Read the notes and definitions.
- 6) Never, never ever, choose an index because of its past performance.

## 5. Things to consider when implementing indexation in a contract or agreement

- 1) Ensure that the reference to the chosen index is clear and unambiguous.
- 2) State the base date for the updating.
- 3) Be clear on the frequency of updating.
- 4) Be clear on how to deal with the changing status of the indices, e.g. forecast, provisional, firm, etc.

- 5) Be clear on how to implement revisions to the index, changes to the index base date, discontinuation, etc.
- 6) Check the availability of the index.

## 6. Availability of indices for civil engineering

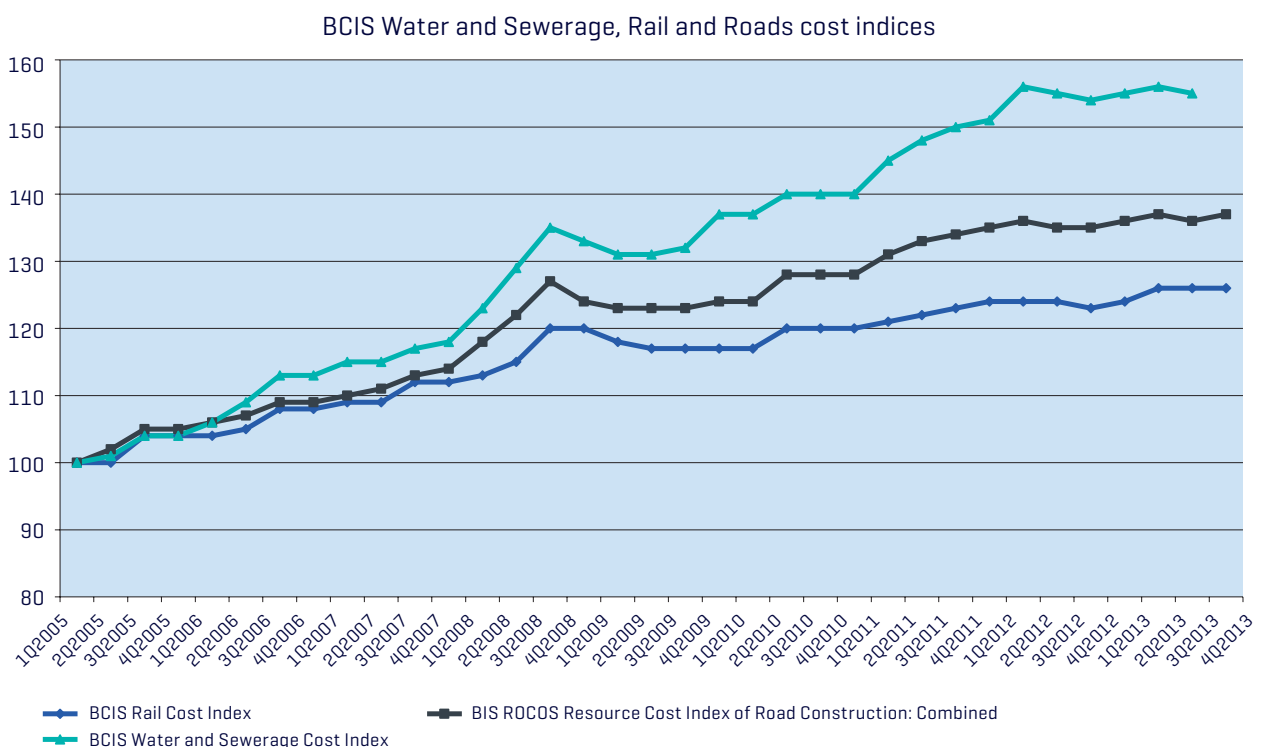
The main sources for relevant indices in civil engineering are:

- Department of Business Innovation and Skills (BIS)\*
  - Cost indices for roads (ROCOS) and infrastructure generally (FOCOS)
  - Tender price index for roads (ROADCON)
- BIS/Office of National Statistics (ONS)\*
  - Output price indices for infrastructure (IOP1) and all construction (COP1)
- BCIS\*\*
  - Cost indices for infrastructure generally (GCECI) and for roads, water and sewerage, and rail (see Graph C)
  - Tender price indices for infrastructure and building
- BCIS Price Adjustment Formulae (PAFI) cost index series\*
  - Civil engineering (Baxter)
  - Specialist engineering
  - Highways maintenance
- BEAMA (The British Electrotechnical and Allied Manufacturers' Association)

\*Available in the RICS Infrastructure Information Service

\*\* Available exclusively in the RICS Infrastructure Information Service

**Graph C: Resource cost by civil engineering sector**



## Conclusion

Allowing of inflation is an important part of the process of developing and delivering infrastructure projects. There are a variety of inflation indices produced specifically for the infrastructure sector. The movement in the indices controls significant amounts of money. It is therefore important to choose the most appropriate index and apply it correctly.

- i *Government Construction: Construction Cost Reductions, Cost Benchmarks, & Cost Reduction Trajectories to March 2013, Cabinet Office, 2nd July 2013. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/211105/GCS\\_Publication\\_2\\_July\\_2013\\_Departmental\\_Cost\\_Benchmarks\\_Cost\\_Reduction\\_Trajectories\\_and\\_Indicative\\_Cost\\_Reductions\\_v0\\_2.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211105/GCS_Publication_2_July_2013_Departmental_Cost_Benchmarks_Cost_Reduction_Trajectories_and_Indicative_Cost_Reductions_v0_2.pdf)*
- ii *RICS Infrastructure Information Service will be a central source for Infrastructure Cost information and will contain:*
  - All relevant cost and price indices - BIS, ONS, BCIS, PAFI indices for infrastructure will be available
  - Five year forecasts of demand, costs and prices
  - Economic background to the forecasts
  - Benchmark cost data for infrastructure entities collated from the UK and internationally
  - Benchmark studies for contract percentages
  - UK location factors based on roads projects and building projects
  - Project analyses and benchmarks for buildings provided in connection with infrastructure projects.

The RICS Infrastructure Information Service is operated by BCIS, details are available from **[rics.org/bcis](https://rics.org/bcis)** or phone: **+44(0)24 7686 8433**

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