

## **Uncertain cost estimates in Swedish national infrastructure plans 2010-2014**

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It has been shown several times e.g. (Flyvbjerg et al 2004) that infrastructure projects often are at high risk of cost escalation. As a measure to concur the problem, the Swedish Transport Administration has gradually implemented new methods for cost calculation, so called successive calculation or successive principle. However, research has shown (Flyvbjerg, 2006) that successive calculation doesn't prevent the risk of i.e. optimism bias or strategic miscalculation or take into account major changes in the project design. The purpose of this study is to examine uncertainties in the cost estimates in the Swedish national investment plan for infrastructure, after introducing new methods of calculation. We are doing this by studying how cost estimates for the same projects change over time (before the projects are built). The study adds knowledge about cost escalation in the Swedish case and also about cost escalation in an entire national investment plan for infrastructure, not only for projects one by one.

Key concepts are cost overruns and causes of cost overruns.

The Swedish government decides about national investment plans for infrastructure about every fourth year. The recent plan for 2010-2021 was decided in 2010 and it will be revised in 2014. In between, in 2012, the Swedish government has ordered a quality check of the latest plan, before giving directives for a new plan proposal from the Transport Administration. Prior to both plan revisions and the quality check, the Transport administration has delivered updated cost estimates for the suggested projects.

### **Method and data**

We have collected cost estimates for the same, about one hundred, projects from:

- 2010, the plan for 2010-2021
- 2012, the quality check 2012
- 2013, the proposal to the revised plan for 2014-2025.

We compare these three cost estimates, for each project, at 2012 prices, to see whether the cost estimate for the project rise or fall or stay unchanged. We also study if costs estimates vary differently depending on transport mode, total project cost or method of calculation. The projects are coded with the method of calculation "full successive calculation", "simplified successive calculation", or "other". For projects where costs have varied most we have scanned causes for this.

### **Results**

The study shows that the three cost estimates for the same projects vary a lot, even though produced over a relatively short time period 2010-2013. For 75 % of the projects, cost increases 10 % or more (up to 228 %) between 2010 and the quality check 2012. Between the quality check 2012 and the proposal for a new plan 2013 20 % of the projects increased 10 % or more. For the whole period, 2010-2013, 60 % of the projects have increased more than 10 %.

The total cost estimate for the projects in 2010 was approximately 165 billion Swedish crowns (18,8 billion Euros) in 2012 prices. Two years later, by the time of the quality check, the total cost estimate had increased to approximately 192 billion Swedish crowns, an increase of the total cost of about 16 %. Another year later, in 2013, the total cost had

decreased slightly again to 185 billion Swedish crowns. Total cost of rail projects increase with 15 % from 2010-2013 and total cost of road projects with 8 % in the same period.

The plan consists both of projects that are in early planning stages and other close to being built. Cost of projects closer to the construction phase varies less than projects in the early stages of planning. Small projects vary more than the largest ones. Other studies (Pyddoke, Lundberg, Jenpanitsub, 2011) also have shown that small projects are at higher risk for cost escalation. Cost of projects with a full successive calculation in 2010 varies less than projects calculated with other methods. This could be due to the method itself but also due to the selection of projects calculated with this method.

The largest cost escalations are due to causes that could be divided into miscalculations (i.e. geology, complex construction parts, market), higher demands from other authorities (mostly rail safety) or change of project design (i.e. extended road or rail length, new intersections, more ITS).

### **Implications for practice and policy**

Large uncertainties in the cost estimates may never be completely reduced but decision makers ought to be aware of how big the risks are and be able to understand how to interpret the cost estimates for projects at different stages in the planning process.

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