DISTRIBUTIONAL EFFECTS OF THE REVISION OF SWISS WATER FEES

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Overview

Since the electrification of Switzerland at the beginning of the 20th century, hydropower has been the country's main domestic source of electricity. However, the economic crisis, the low price of coal and of CO_2 certificates as well as the national and other European subsidy systems for renewable energies have led to a significant drop in overall electricity wholesale market prices. Therefore Swiss hydropower operators got under pressure to identify strategies to increase competitiveness by reducing production costs (Filippini et al., 2017). To support existing hydropower companies in the short-term the Swiss government has introduced some temporary support mechanisms. However, water fees form an important cost element for hydro companies threatening their profitability. At the same time with about 500 million CHF per year these fees represent an important income for mountain cantons and municipalities. In June 2017 the Federal Council decided to open a debate on the reformation of the water fee regime proposing that after a transition phase (until 2022) with reduced fees a new system combining fixed and variable components is to be implemented. This change is likely to have a profound impact on the future of Swiss hydropower. Given that those changes will affect middleland cantons, which are mainly the shareholders of the larger utilities in Siwtzerland and mountain cantons which receive the water fee differently, this reform will be challenging for Swiss policy makers.

Given the ongoing debate about the role and future of Swiss hydropower, the objective of this paper is to focus on the potential shifts in financial streams to companies, cantons and municipalities under a mixed fixed-variable water fee regime. Using a set of potential market development scenarios, we will highlight the distributional effects of the proposed water fee adjustments.

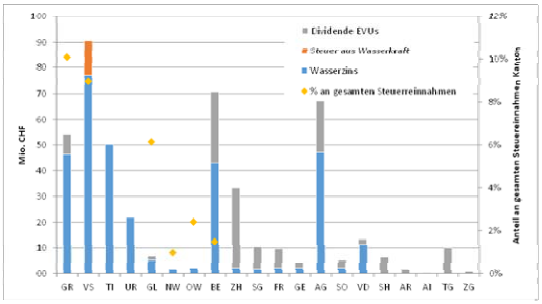
Methods

The analysis is based on a balanced panel data set comprising 70 hydropower firms for the years of 2015 to 2016. Most of these firms are so-called "Partnerwerke", which means that different utilities are jointly holding the concession for a hydro power plant. The financial data was extracted from the yearly annual reports of these firms and extended by firm specific technical information contained in the "Statistik der Wasserkraftanlagen der Schweiz" (WASTA, published annually by the Swiss Federal Office of Energy, BFE (2017)). By means of this technical information, hydropower firms are classified into three distinctive categories to account for heterogeneities in the production processes of the power plants. The three categories, representing the dominating power plant type operated by a firm, are: run-of-river, storage and pump storage (Filippini et al., 2017). As in Filippini et al. (2017), the sample of firms represents the Swiss hydropower sector quite well, especially in terms of the turbine capacity and expected generation. For the period 2015 to 2016, we observe approximately 65 percent of the total generation of the Swiss hydropower plants with a turbine capacity larger than 300 kW. This dataset allows us to translate future revenue streams into financial streams to cantons and municipalities. To provide a reasonable range of distributional effects, we run a set of scenarios both with respect to the water fee structure and the market developments. Regarding the water fees, we cover the current fixed framework (110 CHF), the proposed interim framework (reduction to 80 CHF) as well as variations with variable components. Regarding the market developments, we will rely on the scenarios (see right panel of figure 1 below) derived in Schillinger et al. (2017) covering different fuel, carbon and renewable pathways. Further political adjustments (i.e. import tax regimes) can be added.

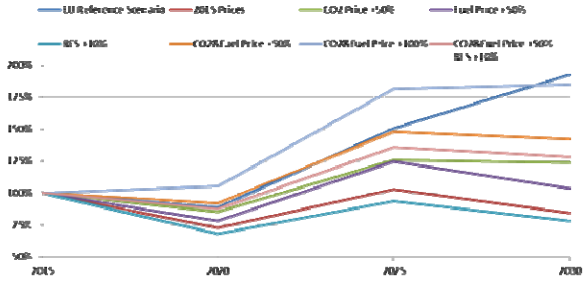
Results

Given the current framework of water fees and ownership of hydropower assets the fees represent an important income for mountain cantons, whereas the dividends represent income for serval middleland cantons. A change in the water fee regime has thus an uneven impact on the different cantons (see left panel of figure 2 below). Given that the current fees are independent from actual company revenues only the tax and dividend components react to market price changes. Consequently, the projected inclusion of a variable component in the water fee regime has severe impacts on the distribution of cantonal income depending on the market developments. Assuming a high market price level, a variable fee provides higher revenues for mountain cantons than the current fixed structure. However, in a low-price environment the opposite holds true. Given the uncertainty about future market price developments (see right panel of figure 1 below) the resulting distributional effects are also uncertain.

Figure 1: Hydro related cantonal income and future market developments



Water levis, tax income and dividends in 2011



Swiss Wholesale Prices Scenarios

Conclusions

This study shows the distributional effects of the proposed water fee framework over time and compares this with the existing system as well as alternatives. The visualized impact for mountain cantons in terms of revenue generated by the water fees and thus provides a valuable input for the expected discussions in preparation of the water fee and market reform.

References

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