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Empirical analyses of financial reports of *Alpiq, Axpo, BKW*

(fiscal years 2009-2018)

A study for the stakeholders of the Swiss electricity industry to review

Management summary

Link to the study

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Management summary

Our focus is on understanding the financial reports of *Alpiq, Axpo* and *BKW in the* first 10 years (2009-2018) of partial liberalization in Switzerland. We consider *quasi* the fiscal decade (FYz) as one period in order not to give the timing of the decisions taken in the Executive Board and the Board of Directors a relevant influence for our analyses.

This brief summary is divided into three sections. In the *first section,* we use selected financial statement data to show the facts that can be gleaned from financial reports in terms of transparency and integrity. In the *second* section, we raise the relevant research questions that arise directly from the facts and describe the approach we then use to provide our answers in section three.

Relevant facts from the financial reports of Alpiq, Axpo and BKW (2009-2018)

We summarize and review production and procurement volumes as well as depreciation and amortization, impairment losses, provisions recognized in profit or loss, and special items. Furthermore, we show the EBIT over the reported period both in CHF million and per kilowatt hour (kWh) produced to enable a relative comparison among the three major electricity producers. We briefly explain the different segmentations of the business units and implications by the reconciliation column of the segment statement.

Alpiq generated around 245 TWh in the FYz and procured an additional 630 TWh of electricity from third parties. Over the FYz, the EBIT showed an overall loss of *minus* CHF 680 million. If we consider those segments that mainly cover business activities relating to "Production, Trading and Sales", the result is a loss of rounded *minus CHF* 480 million. Per kWh produced, this corresponds to a loss of rounded ***minus* CHF 1.96/MWh (= minus 0.196 Rp./kWh**).

Axpo produced around 360 TWh in the FYz and procured an additional 335 TWh of electricity from third parties. Over the FYz as a whole, the EBIT showed a loss of *minus* CHF 245 million. If we look at those segments that mainly cover business activities relating to "Production, Trading and Sales", the result is a loss of rounded *minus* CHF 1,665 million. Per kWh produced, this corresponds to a loss of rounded ***minus* CHF 4.63/MWh (= minus 0.463 Rp./kWh).**

In the FYz, *BKW* produced around 115 TWh and procured an additional 105 TWh of electricity from third parties. Over the FYz, the EBIT showed an overall *plus of* CHF 2,610 million. If we look at those segments which mainly cover business activities relating to "Production, Trading and Sales", the result is a plus of rounded CHF 1,160 million. Per kWh produced, this corresponds to rounded ***plus* CHF 10.10/MWh (= plus 1.01 Rp./kWh).**

Valuation adjustments, provisions and special effects had a negative impact on profit and loss over the FYz and were *unanimously* justified in the financial reports by the collapse in electricity prices and regulatory interventions. For *Alpiq,* the negative impact on the EBIT amounts to *minus* CHF 4,160 million, for *Axpo minus* CHF 6,505 million and for *BKW the negative* impact amounts to *minus* CHF 995 million.

Another important parameter is the ordinary depreciation per kWh produced, which is determined on average over the FYz in the context of "Production, Trading and Sales". The smaller the ordinary depreciation, the smaller the internal settlement between "Electricity trading" and "Production". The smaller this offsetting, the greater the relief for "Electricity Trading" and the better the financial result of "Electricity Trading" can be expected. For *Alpiq,* the average depreciation over the FYz is 1.06 Rp./kWh, for *Axpo on average* 0.62 Rp./kWh and for *BKW on* average 0.72 Rp./kWh.

Over the FYz, the reconciliation segment shows a total loss of *minus* CHF 1,290 million at *Alpiq*, *minus* CHF 290 million at *Axpo* and a total loss of *minus* CHF 8 million at *BKW.*

Key questions and methodological approach

The EBIT reported in absolute figures (CHF million) show large differences between *Alpiq, Axpo* and *BKW.* Both in absolute terms (CHF million) and in relative terms per kWh produced (Rp./kWh). The different production volumes or procurement volumes from third parties are not sufficient to explain these differences. The relevant factor that helps explain the differences in EBIT over the FYz is the financial result of electricity trading.

We adjust the EBIT from the business activities "Production, Trading and Sales" for the allocated valuation allowances, provisions and special items in order to decouple ourselves from the balance sheet management of the executive boards. This may also include a multi-year rolling of trading losses. We recall in this context the incompleteness of the electricity market, which entails a notable uncertainty in the accounting of forwards [11e]. In a second step, we use four management metrics to determine i) the intrinsic value of the power plant portfolio, ii) the financial result from hedges with liquid futures, iii) the revenue potential from power plant optimization, and iv) the revenue potential from the sales business. We compare the sum of these four components to adjusted EBIT. The difference of these reflects the financial result of speculative power trading (Proprietary Trading) over FYz.

In the management metric, which defines the intrinsic value of the power plants, we also anchor the basic supply with an imputed full cost price of 6.4 Rp./kWh as well as the benchmark for depreciation of[1] 1.25 Rp./kWh.

Findings and conclusions

Alpiq shows an adjusted EBIT of plus CHF 3,680 million (+1.50 Rp./kWh) over the FYz, *Axpo* of plus CHF 4,490 million (+1.25 Rp./kWh) and *BKW* of plus CHF 2,160 million (+ 1.88 Rp./kWh). The values are used in Table I to derive the financial result from speculative proprietary trading.

[1] SFOE (2018): *Profitability of Swiss hydropower (results of a data survey of operators of Swiss hydropower plants commissioned by UREK-N)*, report dated January 29, 2018 (link).

The intrinsic value of the annual production of the power plant portfolio represents the achievable revenue at the day-ahead auction including a correction for electricity deliveries to the basic supply. We further account for differences in depreciation and amortization with the underlying metric.

We assume a sales volume of 6 TWh for *CKW* (within *Axpo*) and 8 TWh for *BKW* into the basic supply. We have received confirmation from the Swiss electricity industry that these sales volumes for the basic supply are too high. However, since we have not received any correction from the companies, we are sticking to these overestimated sales volumes. Production volumes delivered to the basic supply are not subject to hedging, as these volumes are not exposed to any market price risk. In our analyses, we also use sales volumes that are too high for basic supply to reduce the financial result in speculative proprietary trading. The chargeable energy tariffs for the tied end customers are regulated and reflect the full prime costs of the power plant fleet. Together, this explains why *Axpo*'s hedging result is lower than *Alpiq's*, and *BKW*'s hedging result is significantly lower than *Axpo's, in* relation to the respective production volumes. The same applies to revenue from the sales business.

Revenues over fiscal decade (2009-2018)	**Alpiq**	**Axpo**	**BKW**
Adjusted EBIT (in CHF million)	**3680**	**4490**	**2160**
minus intrinsic value of power plants (incl. GV)	-3475	-5920	-1880
minus hedging proceeds (without sales in GV)	-2780	-2610	-270
minus revenue from KW optimization	-640	-975	-420
minus proceeds from distribution business (excluding GV)	-1230	-1385	-90
Speculative proprietary trading (in CHF million)	-4445	-6400	-500
Speculative proprietary trading (in Rp./kWh)	-1.81	-1.78	-0.43

Table I: Financial results over 2009-2018 in CHF million (data source: 2009-2018 financial reports of *Alpiq, Axpo, BKW* as well as EEX, EPEX-Spot and calculations of ior/cf-HSG).

The revenues from hedging shown in Table I relate to the volumes reported for flexible storage energy and base load energy without thermal production and without sales volumes to the basic supply. The revenue component from thermal production is only included in the intrinsic value metric, as we consider hedging to be covered in the intrinsic value as part of cross-commodity management.

The reported revenues from power plant optimization cover the revenues from intraday trading and those from system services. We only take into account flexible storage energy and therefore no other flexible production technologies. In particular, no EBIT contributions from any flexible gas-fired power plants as part of system services, which are regularly highlighted in the financial reports, are taken into account.

In its financial reports[2] in FY 2016, *Alpiq* justified a reversal of provisions in the amount of rounded CHF 263 million with the additional revenues from the Nant de Drance pumped storage power plant that may be expected due to increased volatility in the intraday market. If one takes into account that *Alpiq* has held a share of[3] 39% since 2012 and that Nant de Drance provides flexible storage energy of around 1.75 TWh p.a., it becomes clear that the revenues shown in Table I are significantly lower than those implicitly documented by *Alpiq* via its reversal of provisions.

It should be noted in *summary* that only the volume of own generation is taken for the estimation of the EBIT for the sales business. Revenues generated from electricity deliveries via third parties in the market are not included: In terms of volume, we have taken into account only the Swiss sales market for revenue from the sales business, with the production volumes published in the 2009-2018 financial reports of *Alpiq*, *Axpo* and *BKW*. This entails the following: revenue from energy deliveries for electricity customers abroad has not been included in the imputed revenue potential. Similarly, the revenues for electricity customers in Switzerland not covered by Swiss own production, for which *Alpiq*, *Axpo* and *BKW* subsequently have to procure the energy additionally from the European wholesale market, are not included in the metric. Last but not least, it should be noted that revenues from trading with guarantees of origin are also not included in the metric. The reasons for this lie in the lack of availability of this data.

Since the same four management metrics are applied to all three electricity producers, it is also possible to formulate the financial success in speculative proprietary trading in relative terms. If we take *BKW*'s success in speculative proprietary trading as a benchmark for this purpose, the following comparisons are permissible:

- In speculative proprietary trading, *Alpiq's* loss is 1.38 cents per kWh higher than that of *BKW*. *In* relation to *Alpiq*'s total production volume, this results in an annual loss that is CHF 338 million higher. The resulting loss for *Alpiq* over the FYz as a whole is CHF 3,380 million higher.
- In speculative proprietary trading, *Axpo's* loss is 1.35 cents/kWh higher than that of *BKW*. *In* relation to *Axpo*'s total production volume, this results in an annual loss that is CHF 486 million higher. The resulting loss for *Axpo* over the FYz is 4,860 million higher overall.

We believe the primary cause of excessive speculative losses is an inadequate internal control system, which in particular does not sufficiently monitor the speculative components of hedging or management strategies. Without a differentiated internal control system that documents a transparent, unalterable and verifiable allocation of trading transactions to asset optimization, hedging and speculative proprietary trading, the management, the board of directors and last but not least the shareholder of a large electric utility are exposed to *adverse selection*. This leads to market inefficiency. This in turn directly contradicts the required tariff setting based on efficient production and thus the StromVG. The external auditors generally note the existence of internal control systems, but do not make any statements about their effectiveness. Management is responsible for the design of the internal control system.

[2] Financial reports *Alpiq* 2016 (p. 62, 105), *Alpiq* 2017, (p. 63, 109), *Alpiq* 2018 (p. 63, 107)

[3] *Alpiq* Financial Reports 2012 (p. 16, 50)

Responsibility for monitoring the effectiveness of the internal control system lies with the Board of Directors.

Furthermore, we recall the concept of the fair value hierarchy [4], which imposes requirements for trading products in Level 3 that transparently show whether and to what extent the parameterization of company-internal models reveals speculative market assessments. With its fair value hierarchy, IFRS also takes into account the incompleteness of electricity markets.

For the sake of completeness, it should be noted that the losses in the reconciliation column of the segment statement of *minus* CHF 1,290 million for *Alpiq* and *minus* CHF 288 million for *Axpo* are not included in the reported losses in speculative trading and are therefore additional. These losses remain largely unexplained in the financial reports. Only the losses from onerous energy contracts are reported transparently by management using the accounting instrument provisions.

Losses over period 2009-2018 (in CHF million)	**Alpiq**	**Axpo**	**BKW**
onerous energy contracts	**441**	**2015**	**489**
reconciliation column of the segment statement	**1290**	**288**	**8**
Speculative proprietary trading	**4447**	**6401**	**498**
Total loss (CHF million)	**6178**	**8704**	**995**

Table II: Losses over period 2009-2018 in CHF million (data source: 2009-2018 financial reports of *Alpiq, Axpo, BKW* as well as EEX, EPEX-Spot and calculations of ior/cf-HSG).

Table II summarizes the relevant figures.

The study is divided into 11 sections: At the beginning, there is a Management Summary (Section 1) and an Introduction and Objectives (Section 2). In Section 3, we provide an outline and raise awareness of important correlations or missing relevant correlations in the financial reports of Swiss power companies. We introduce a hedge index that documents the financial success of deterministic hedging strategies for base and peak productions according to their lead times. Within *BKW*, the business activities " Grids" are reported separately from "Production, Trading and Sales". Within *Alpiq* and *Axpo*, they are reported together with "Production" or "Trading" or "Sales" in the respective business segments. Since, on the one hand, the business activities "Grids" are regulated, we adjust the EBIT of *Alpiq* and *Axpo* accordingly.

In Section 4, we focus on the reconciliation column of the segment statement, which offers the possibility of having the Group segments presented better than they are in the segment reporting. This needs to be examined in more detail in particular if the effect on profit of this reconciliation column - as in the case of *Alpiq*, for example (negative EBIT contribution of CHF 1,290 over the FYz) - is strongly negative.

[4] International Accounting Standard Board: IFRS 13 Fair Value Measurement, paras. 72-93

In Section 5, we reflect the important key figures in the financial reports of *Alpiq*, *Axpo* and *BKW* separately according to the business segments. In particular, we show EBIT over the periods reported both in CHF million and per kilowatt hour (kWh) produced to allow absolute and relative comparability among the three major electricity producers. We recognize that we cannot avoid including impairment charges, provisions recognized in profit or loss, and special effects in our analysis.

In Section 6, we report the valuation allowances relating to "Production, Trading and Sales. We do the same for provisions, distinguishing between provisions recognized in profit or loss and provisions not recognized in profit or loss, and separating provisions for losses on energy contracts from other provisions. We further include depreciation and amortization and explain their impact on the financial result in electricity trading. Special items are often documented separately in the appendices and provide an in-depth insight into the regulatory environment.

Section 7 is devoted to the marketing of electricity production, which we divide into four trading activities based on four so-called management metrics. This provides us with the basis for adjusting the EBIT with reference to "Production, Trading and Sales". We understand this to mean that for the individual fiscal years we exclude the decisions made by the Executive Board and the Board of Directors regarding value adjustments, provisions recognized in profit or loss, and special effects. In effect, we adjust the EBIT for the collapse in electricity prices and for changes in the regulatory environment. The resulting differences in adjusted EBIT are then primarily driven by the different trading profit in speculative proprietary trading, which we subsequently estimate for *Alpiq, Axpo* and *BKW in* sections 8,9,10 and subject to sensitivity analyses.

In Section 11, we reflect on the lessons learned and draw conclusions that are relevant to management, the Board of Directors, auditors, regulators, and supervisors.