1 Overview

Starting from February 2022, Central Securities Depositories within the European Union are required to apply mandatory cash penalties and buy-ins for late-settled and late-matched trade transactions. This is the enforcement of settlement discipline known as central securities depositories regulation - CSDR. Ocamsoft's Penalty Ledger is a web-based application which allows participating counter-parties to calculate penalties. In the case of failed trades under CSDR, we can quantitatively forecast exposure to penalties with predictive analytics, and report on penalties owing on transactions. In Penalty Ledger, the trade information is entered as an automatic data feed or web-form with details necessary to calculate penalties. A calendar entry is then generated together with an optional alert, so that the counter-party can be notified of impending settlement requirements and accurate penalty exposure. This information can be built into the investors' risk management and settlement process.

2 Penalty Calculation

The exposure of investment firms to penalties under late-settled trades under the CSDR framework depends on the penalty rate. From a static data perspective, penalty rates are determined by the security classification, transaction type, whether the security is exclusively traded in an SME market, and the nature of the market under which the security is matched. The penalty also depends on the underlying price of the security involved in the transaction. Penalty Ledger evaluates the relevant closing price in the exchange according to volume, liquidity or relevant market for the security, whichever criterion can be first established unambiguously.
The application includes a holiday calendar to avoid non-market days for penalty aggregation and an FX module for establishing the currency for the penalty in the country of settlement (for late-settlement penalties) or in the country of the exchange (for late-matched penalties).

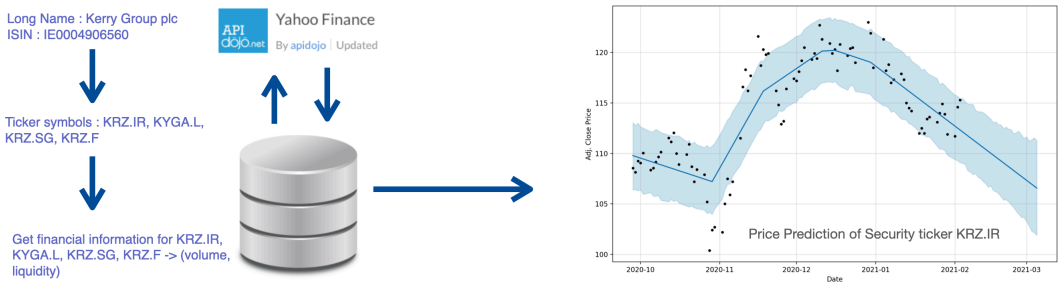
2.1 Reference Data Integration

The calculation of late-settlement and late-matched penalties depends on the static penalty rates which themselves are derived from security classification data. Penalty Ledger sources these data from the European Securities Markets Authority (ESMA). The application serves as a data warehouse for these data and the security-level information is retrievable from a REST API end-point in JSON format. The FX data used in the calculation is also stored for the conversion of penalties in the currency of the place of settlement.

3 Penalty Prediction

3.1 Price Prediction and Error Estimation

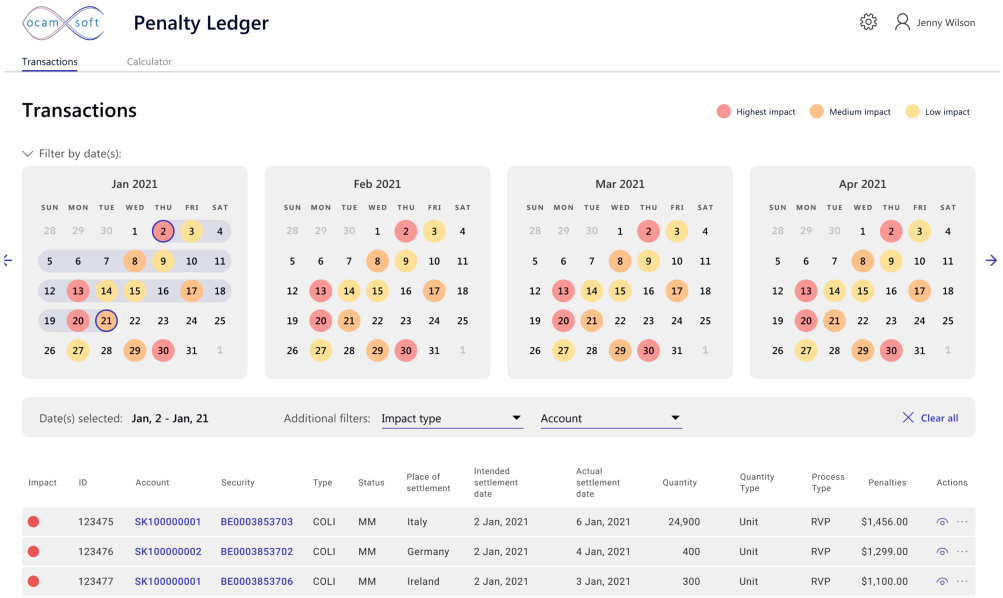
In order to forecast penalties, Penalty Ledger implements predictive analytics based on 1 year of historical closing price data. This application module also incorporates a quantified estimation of the error spread of the penalty calculation, so that a meaningful comparison to other quantified risks can be established.



4 User Interface and API Components

4.1 Calendar Entry

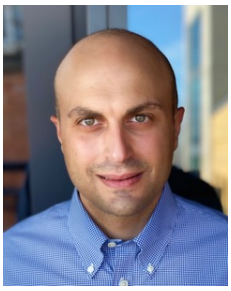
Once a trade is logged in Penalty Ledger, a calendar entry is generated (either in present or in the future). When the date of the putative penalty is approached, a renewed closing price prediction is re-calculated based on the the more recent and accurate historical pricing data, refining the accuracy of exposure to penalties.



4.2 API Service

Penalty Ledger exposes REST API services to allow independent usage of its core components, such as security reference classification data, penalty calculation, closing price prediction and calendar entries for aggregated penalties. With these services, overall quantitative penalty risk exposure can be established and ad-hoc queries can be performed on-the-fly.

5 Meet the Directors



Carmine Giardino is a software engineer with over eight years of experience in the insurance and financial services industries. In recent years, he has specialised in distributed and data-intensive software systems and regulatory reporting.

Mark Hickey spent 10 years in physics research before moving into the world of commercial computer software. He has worked as a support consultant for a big data firm and, more recently, as an application developer in financial services. His particular interests lie in the simplification of complex problems and in seeking a clear understanding of solutions.

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