**CERF Project Update – August 2020**

**Title**

Building a robust combinatorial exchange for portfolio trading: a market design approach

**Abstract**

Traditionally each financial instrument is traded in a market of its own. For most traders, however, their desired position for one good is intimately related to their positions on many other goods. A combinatorial exchange integrates markets for various goods by allowing agents to express their portfolio preferences including contingencies and synergies between goods. Building on insights from market design, I aim to develop guidance on how to design matching and pricing rules which make it safe for participants to act on true preferences, match traders efficiently, avoid congestion, and attract liquidity; hence satisfying key properties of a successful marketplace.

**Update**

I started the project at the beginning of my fellowship back in April. It is very much in a stage of developing a family of core theoretical models which capture some prevalent features of real-life markets that can potentially render their conventional operations suboptimal. One such feature is the so-called *complementarities* in a trader’s preferences for multiple assets. A desire to diversify one’s holdings implies her willingness to pay for a bundle of assets can be higher than the sum of her willingness to pay for each asset on its own, especially if the assets in question are not sufficiently liquid, their prices are highly volatile, and/or the trader faces budget constraints. The initial stage of the project is about (i) formalising these features and illustrating the nature of such preferences with explicit constructions, (ii) showing how such preferences can lead to inefficiencies due to the *exposure problem* (and consequently *demand reduction*) when assets are traded in separate markets as is the case in conventional markets. Upon illustrating the nature of these issues in a stylised environment, the next stage will explore a *combinatorial* approach to integrate markets for separate assets. Namely, I will explore how allowing the traders to express their portfolio preferences (as in being able to bid for a bundle of assets) can help alleviate some of the issues identified in the motivating examples. There are no off-the-shelf market-clearing mechanisms to deal with *combinatorial exchanges*. The heart of the project is about designing allocation and pricing rules which encourage market participation and efficiency by successfully addressing the key issues (such as the *exposure problem* mentioned above) which typically emerge in the face of rich preferences.

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