Meeting Minutes

PWC ILab Teams Meeting on 24.11.2023, 9am

Agenda:	Review of last meeting's task agreements Specify tasks for the next meeting
Participants:	PWC: Christian Koellich, Florian Moemken, WU: Florian Pauer, Lukas Handler, Students: Arina Suhodolova, Sophie Grill, Alexei Volodin, Dinara Zainullina, Sebastian Herzog
Last Meeting:	09.11.23, 10am
Next Meeting:	Online Teams Meeting on 07.12.23 at 9am

Discussion of tasks performed for today's meeting

Collected Data

Team	Collected daily data on different asset classes and did PCA on the data. Macro data only available for 20-30 years and only infrequently (quarterly, monthly)
Moemken	Clarifying if index data of different asset classes is chosen or detailed data within an asset class.
Team	First approach, different asset classes in the form of indices.

Test PCA implementation

Team	Shows presentation on outcome of first PCA implementation (attached in e-mail). Data is highly clustered
Koellich	Clustering is unsurprising because of 20-year time frame. Despite high correlation between equity and interest rates advice to keep both classes.
Koellich	Instead of whole time frame, sub-windows should be choses using different statistical analysis to derive/establish rolling windows.
Pauer	Question, if a time series plot was implemented
Team	Will be taken into account for the next meeting
Pauer	Either returns or yields should be used for PCA, don't use them together
Koellich	Need to discuss cut off criteria to agree on how many Principle Components to keep and analyze (e.g. number of components to explain 85% of the variance)

Analysis objective

Pauer	Question if the main objective is to pick most important Principal Components and after the PCA try to describe them by using macro

	data. Or if the macro data should already be included in PCA which would lead to granularity problem.
Koellich	PCA should be done on high frequency(daily, max. weekly) data, not monthly/quarterly data.
Pauer	If macro data used to describe PC's rather than being implemente in PCA, granularity is less of a problem.

Data adjustments (geographical split and time window)

Koellich	Should include as many capital market centers as possible and split every time series geographically by expanding the PCA dataset (USA, Europe, Asia,..).
Team	Question how windows should be chosen
Koellich	Use statistical tests to get an objective idea which time span is statistically sufficient to run the PCA. To get acquainted to the rolling window mechanic, any rolling window can be chosen. Should also compare minimum sufficient window to optimal window.

ICA (Independent Component Analysis)

Koellich	Question, if ICA was/will be implemented (note in last meeting that PCA assumes normal distribution). ICA could add something to accuracy.
Pauer	PCA does not assume any distribution, it guarantees to lead to uncorrelated PC's but is not a necessary condition for PCA analysis. However, the addition of ICA after PCA implementation is advisable.

Key summary and tasks for next meeting

Koellich	– Expand data and try different regional settings with a rolling window approach – Research suitable tests to choose an optimal rolling window – Compare rolling window(s) to full window. – Plot Principal Component time series of the full time window.