STOCK MARKET VOLATILITY DYNAMICS FOR SERVICES INDUSTRIES IN EUROPE

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RESEARCH OBJECTIVE

- The large effort to build a metric for risk has come a long way with an impressive series of papers focusing on the GARCH modelling techniques
- Our article investigates the extent to which these levels of persistence are industry-related
- We investigate the empirical properties of the parameters that account for persistence in the set of companies that compose the most cited pan-European stock market index STOXX 600

MOTIVATION

- The field of volatility was largely analyzed by a series of seminal papers that culminated with the work of Engle (1982)
- Despite this considerable work, the dynamics of volatility are not entirely supported by theoretical representations in the existing literature
- This situation fed the development of a great deal of other models that focus only on the empirical properties of data with the (largely accepted) expectation that theoretical explanation will be insured by the field of behavioural finance
- One of these features of volatility dynamics is based on the observation that squared returns are usually predictable, which means that using a relevant history of stock market returns one could estimate the future dynamics of the latent variable (i.e. volatility)

DATA

- The data used in this paper consists in stock market prices for all the components of the STOXX 600 index for the period January 2015 until September 2018
- Out of the 600 assets in our analysis, we took out the ones with more than 25% of non-trading days, resulting a set of 451 companies from 26 industries, according to Bloomberg classification

Automobiles & Components
Banks
Capital Goods
*Commercial & Professional Services
Consumer Durables & Apparel
*Consumer Services
Diversified Financials
Energy
Food & Staples Retailing
Food Beverage & Tobacco
*Health Care Equipment & Services
Household & Personal Products
Insurance
Materials
Media
Pharmaceuticals, Biotechnology & Life Sciences
Pharmaceuticals, Biotechnology & Sciences
Real Estate
Retailing
Semiconductors & Semiconductor Equipment
*Software & Services
Technology Hardware & Equipment
*Telecommunication Services
Transportation
Utilities
Others

* Industries that are considered services-related sectors

METHODOLOGY

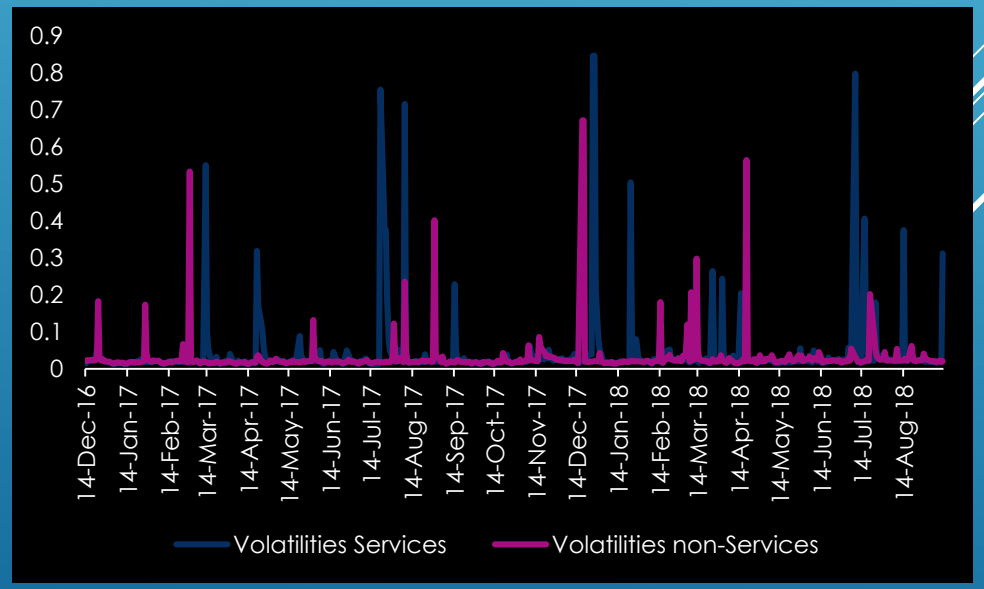
- The model that is suited for equity returns is the EGARCH model, as in Nelson (1991) specification. We use this model due to the fact that it takes the leverage into account. The models is the following:

$$\sigma_t^2 = \omega + \alpha_{t-1}|\epsilon_{t-1}| + \gamma|\epsilon_{t-1}|I_{[\epsilon_{t-1}<0]} + \beta_1\sigma_{t-1}^2$$

- We will consider the β_1 coefficients to be the measure of persistence.

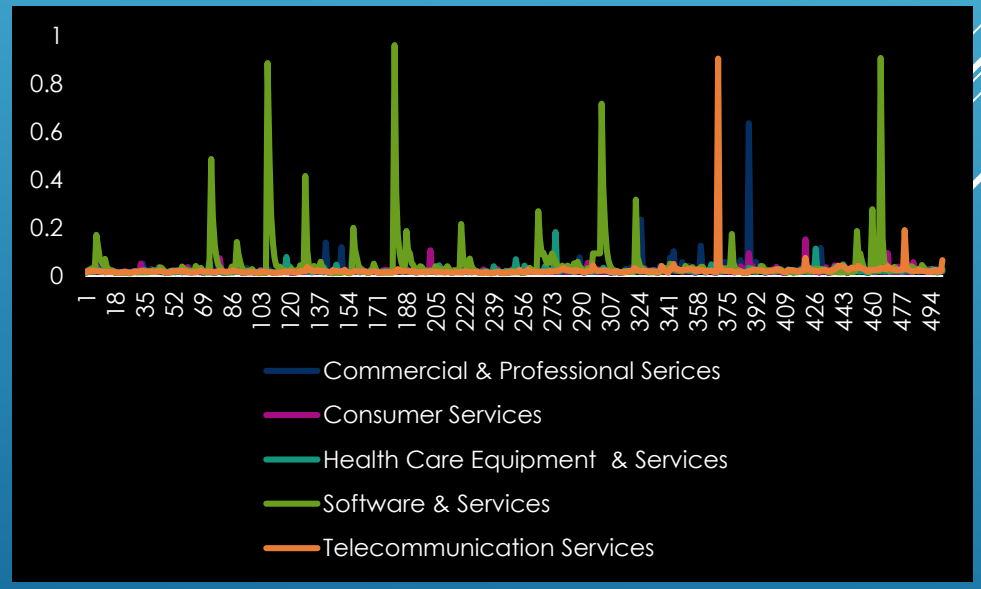
RESULTS

- We notice the similar dynamics of these measures, with large values for the Commercial and Professional Services and lower values for the Telecommunication Services



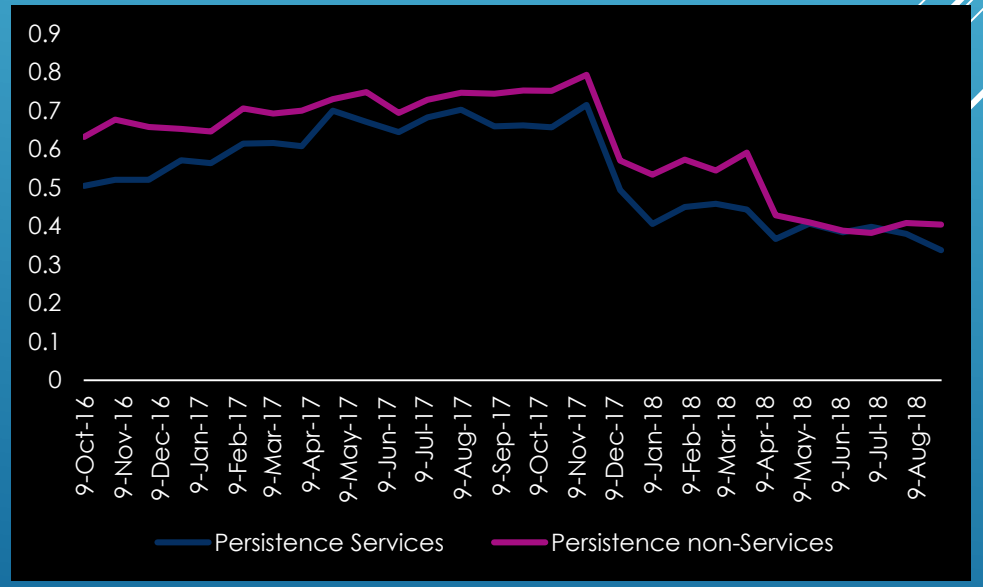
RESULTS (CONT'D)

- Running the estimation for samples of 500 observations every 20 days, we obtained 29 estimations for each asset in our analysis.
- If we consider that the persistence of volatilities is measured by the last parameter (the β_1 coefficient in our specification), we may say that we obtained evidence in favor of our hypothesis
- This means that the persistence of assets belonging to the Services sectors is almost all the time lower than the persistence of the other industries (the non-services ones).



RESULTS (CONT'D)

- We could therefore conjecture that the persistence of volatilities for assets that belong to the services sectors is less dependent on the historical shocks than the ones belonging to the other sectors
- We notice that for all the assets in our sample an important change in persistence was recorded at the end of 2017, even though the hierarchy was still kept



RESULTS (CONT'D)

- When looking at the five sectors belonging to the "Services" industries, we notice that we have similar changes.
- Therefore, the Health Care Equipment and Services showing the largest values of persistence in the first part of our sample, while the Software and Services showed more persistence in the second part of the analysis

Coefficients of persistence for all the five sectors considered as "Services"

CONCLUDING REMARKS

- Our analysis consisted in testing the hypothesis that companies operating in sectors that are related to services tend to be less predictable, depend less on historical changes and exhibit more uncertainty when compared with the set of all other assets.
- We used companies from STOXX 600 and recorded daily data from January 2015 until September 2018.
- When our volatility models were employed, we found evidence that the uncertainty for the companies belonging to the "Services" sectors is smaller than for the other companies.
- We consider that this is motivated by the tendency of these businesses to develop new profit generating models in a changing environment.