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Clustering Duration Cluster Patterns in Financial Markets – Empirical Evidence on FTSE100

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Abstract

This paper investigates trade duration clusters of all stocks listed in the *FTSE100* stock index. We address the question whether or not different stocks from different industry sectors have different duration patterns when it comes to trading these assets. The answer to this is essential in high-frequency trading as the similarity of durations will reduce the problem of asynchronous trading and improve the scheduling of order placement for certain trading strategies. A flexible augmented ACD model is estimated to capture the duration cluster patterns for trade durations in a limit order book by analyzing the arrival process of trades in the electronic markets. Using transaction data of all 100 FTSE stocks traded at the London Stock Exchange, 69 stocks could be reasonably modelled by a ACD(1,1) specification and, thus, selected for a subsequent cluster analysis to find similarities of the duration patterns across all stocks in our sample.

Key Words: Ultra high frequency transaction data, limit order book, augmented autoregressive conditional duration model.

JEL Classifications: *C22, C41*

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1 Introduction

The last decade has seen a growing interest in the empirical analysis of market microstructure, mainly due to the increasing availability of ultra-high-frequency transaction data. As this tick-data is characterized by the irregularity of time intervals between two consecutive observations, researchers have become interested in studying the duration process of trades. Generally, trade durations can be seen as an indicator for the market's activity. Small durations mean short waiting times between transactions and, hence, imply high liquidity (as the order can be filled quickly). In contrast, long durations indicate a calm market and, thus, signalize a market's (temporal) illiquidity (as it takes too long to get an order executed).

Combining the GARCH methodology with methods from survival analysis, Engle and Russell (1997) introduced the *Autoregressive Conditional Duration (ACD)* framework, considering the real-time trading in financial markets as realisations from marked point processes. The original linear ACD model proposed by Engle and Russell (1998) can be modified by varying its two main model components: (a) the mean equation and (b) the distribution of the residuals. In the last few years, many studies have concentrated on the further development of the *ACD* framework in order to describe order book activities more accurately. In particular, many authors have improved the methodology by suggesting new functional forms for the conditional mean equation in order to account for nonlinear effects as well (for a survey, see Bauwens, Giot, Grammig, and Veredas (2004), Fernandes and Grammig (2006) or Engle and Russell (2004)).

In contrast to GARCH models which are still widely applied in finance, ACD models can only be applied on ultra-high frequency data. In many studies, new suggested specifications were only applied on a rather small sample of a few stocks to show the model's new features, however, it is not investigated whether or not the new models would fit for a wide range of stocks as well. So far duration patterns are only investigated in terms of their temporal clustering behaviour, but only little is known about which parameter constellation is more common.

It is well-known that different assets from the same economic sector tend to show comovements in returns and volatility as they seem to react to a certain economic or political event in the same manner. However, it has not been investigated in the literature whether assets from similar sectors will have the same duration patterns as well when trading these stocks. Will markets for similar assets react to certain events at the same *speed*? In different business cycles, different stocks will show different trading patterns as supply and demand for stocks from different sectors will vary. In a bullish period, not all stock prices will increase; likewise, not all stocks will crash in a bearish market. Companies from different sectors might behave differently as they are not necessarily influenced by the same market factors or information sets, but at least stocks from the same sectors should have

similar patterns and not exhibit different properties.

This paper addresses the question whether or not different assets have different trade duration patterns. The answer to this is essential in high-frequency trading as the similarity of durations will reduce the problem of asynchronous trading and improve the scheduling of order placement for certain strategies, e.g. pairs trading. Our objective is to analyze the duration patterns of the transaction process of all FTSE stocks traded at the London Stock Exchange and to cluster those stocks whose trade duration show a similar stochastic behaviour. We apply the augmented ACD model proposed by Fernandes and Grammig (2006) to capture the duration process as this model is very flexible and nests several other ACD specifications discussed in the literature. To reveal the homogeneity of the stochastic duration patterns across all stocks in our sample we run a cluster analysis on the estimated ACD parameter vectors with different clustering algorithms and distance measures to find the groups based on the ACD parameter estimates.

The paper is structured as follows: In Section 2, the proposed methodology will be introduced. Section 3 presents the data and the empirical results. Section 4 concludes.

2 The Methodology

In this section we first introduce the ACD model and its augmented version to capture the duration clusters of trade durations of all stocks in our sample. Secondly, we briefly discuss the cluster analysis framework (for a overview on cluster analysis, the reader is referred to Kaufman and Rousseeuw (1990)).

Since ultra-high-frequency transaction data arrive at irregular time intervals, the analysis of their stochastic arrival times is very important. Hence, a duration analysis is the common approach to describe these time stamped data. The simple *ACD* framework, a popular tool in recent financial econometrics, models a dynamic point process in which the conditional expectation is written as a linear function of past durations. In its simplest form, it represents a time series model of time, making it easy to understand.

Consider the arrival times of trades t_0, t_1, t_2, \dots with $t_i \in \mathbb{R} \geq 0 \forall i$ as random variables distributed in time by a point process $(t_i)_{i \in \mathbb{N}}$. The filtration is defined as

$$\mathcal{F}_0 \subseteq \mathcal{F}_1 \subseteq \dots \subseteq \mathcal{F}_{i-1} \subseteq \mathcal{F}_i = \sigma(t_0, t_1, \dots, t_{i-1}, t_i)$$

with $\mathcal{F}_0 = \{\emptyset, \Omega\}$. Obviously, \mathcal{F}_i is the σ -field generated by all time random variables observed until t_i . Let $X_i = t_i - t_{i-1}$ denote the i^{th} order duration between the $(i-1)^{th}$ and i^{th} incoming order. The duration is factorized,

$$X_i = \Psi_i \cdot \varepsilon_i \tag{1}$$

with $\Psi_i \equiv E(X_i | \mathcal{F}_{i-1}; \theta)$, i.e. the conditional expectation given a filtration \mathcal{F} until t_{i-1} and i.i.d. innovations ε_i with $E(\varepsilon_i) = 1$ and a non-negative support. In the common linear *ACD* (p, q) model

$$\Psi_i = \omega + \sum_{j=1}^p \alpha_j X_{i-j} + \sum_{k=1}^q \beta_k \Psi_{i-k} \quad , \quad (2)$$

where the parameter vector $\theta = \{\omega, \alpha_1, \dots, \alpha_p, \beta_1, \dots, \beta_q\}$ must satisfy

$$\sum_{j=1}^p \alpha_j + \sum_{k=1}^q \beta_k < 1$$

to ensure stationarity of the process and, additionally, the non-negativity constraints $\omega > 0$ and $\alpha_j, \beta_k \geq 0 \forall j, k$. The $\varepsilon_i \equiv \frac{X_i}{\Psi_i}$ are also called *standardized durations*. The density function is parametrised as

$$\varepsilon_i \stackrel{i.i.d.}{\sim} f(\varepsilon_i; \theta)$$

with (a) normalization $E(\varepsilon_i) = 1$ to ensure that the entire temporal dependence of the durations is captured by the mean function, and (b) a non-negative support to avoid negative durations (Engle and Russell (1998) and Engle (2000)). Engle and Russell (1997) used an Exponential and a Weibull distribution, whereas other authors favoured more flexible alternatives (see, for example Bauwens, Giot, Grammig, and Veredas (2004)). In this study, the generalized Gamma distribution with the density

$$f(x_i; \theta) = \frac{\gamma}{x_i \cdot \Gamma(\lambda)} \left(\frac{x_i}{\Psi_i} \cdot \frac{\Gamma(\lambda + \frac{1}{\gamma})}{\Gamma(\lambda)} \right)^{\gamma\lambda} \cdot \exp \left(- \left(\frac{x_i}{\Psi_i} \cdot \frac{\Gamma(\lambda + \frac{1}{\gamma})}{\Gamma(\lambda)} \right)^{\gamma} \right)$$

is chosen to describe extreme durations as it allows for a non-monotonic hazard function and hence provides a higher degree of flexibility (see Kleiber and Kotz (2003)).

Since the assumption of linearity in eq. (1) is sometimes too restrictive to capture the duration process, several models have been developed and modified with other dependence structures of the conditional mean in order to account for nonlinear impacts (for a survey, see Hautsch (2004)). Generally, new and different types of *ACD* models can be created by varying the functional form $g(\cdot)$ of Ψ_i in the model's equation

$$X_i = g(\Psi_i) \cdot \varepsilon_i \quad .$$

Adopting the idea from Hentschel (1995), Fernandes and Grammig (2006) proposed the augmented ACD model assuming a nonlinear function of the conditional mean

$$\Psi_i^\delta = \omega + \alpha \Psi_{i-1}^\delta (|\varepsilon_{i-1} - b| + c(\varepsilon_{i-1} - b))^\nu + \beta \Psi_{i-1}^\delta \quad (3)$$

which nests a wide range of ACD specifications discussed in the literature. For $\delta = \nu = 1$ and $b = c = 0$, the augmented ACD is playing a role as linear ACD. Further, some typical non-linear ACD models listed above are also nested: (1) for $\delta, \nu \rightarrow 0$ and $b = c = 0$, it nests the Log ACD type I model; (2) for $\delta \rightarrow 0, \nu = 1$ and $b = c = 0$, the Augmented ACD will performance as Log ACD type II model; (3) for $\delta = \nu$ and $b = c = 0$, it nests the power ACD model; (4) for $\delta \rightarrow 0, b = c = 0$, a Box-Cox ACD will be nested.

In the augmented ACD model, the news impact curve can be captured by

$$g(\varepsilon_{i-1}) = [|\varepsilon_{i-1} - b| + c(\varepsilon_{i-1} - b)]^\nu \quad , \quad (4)$$

providing a more flexible functional form which allows the conditional duration process to respond in distinct manners to shocks. In particular, b and c are the parameters which indicate the asymmetric response: b shows the shift amount of the asymmetry, while c determines the rotation amount and direction. If c is greater than 0, the rotation is counter-clockwise, otherwise the rotation is clockwise. Additionally, δ and ν represent the shape parameters. For $\delta \geq 1$ and $\nu \geq 1$ the concavity is shown, whereas $\delta \leq 1$ and $\nu \leq 1$ induce convexity to the news impact curve.

Due to certain institutional characteristics of organized financial markets, such as opening and closing hours or intraday auctions, most intraday data will have a consistent diurnal pattern of trading activities over the course of a trading day. As the observed durations \tilde{X}_i are systematically biased, it is necessary to take the regular daily seasonality into account, meaning that smoothing techniques are required to get deseasonalised observations. In this paper we estimate the diurnal patterns by computing the cubic spline functions $m(t_i)$ using every 30 minutes ($t = 8.00, 8.30, 9.00, \dots$) as nodes.

Thus, $X_i \equiv \left(\tilde{X}_i / m(t_i) \right)$ is the deseasonalised duration and should have no diurnal pattern and a unit mean. The ACD model is estimated by maximum-likelihood. The likelihood function of the model with a generalized gamma distri-

bution for the innovations is

$$L(x_1, \dots, x_N; \theta) = \left[\prod_{i=1}^N \frac{\gamma}{x_i \cdot \Gamma(\lambda)} \left(\frac{x_i}{\Psi_i} \cdot \frac{\Gamma(\lambda + \frac{1}{\gamma})}{\Gamma(\lambda)} \right)^{\gamma\lambda} \right] \cdot \left[\exp \left(- \sum_{i=1}^N \left(\frac{x_i}{\Psi_i} \cdot \frac{\Gamma(\lambda + \frac{1}{\gamma})}{\Gamma(\lambda)} \right)^{\gamma} \right) \right]$$

(see also Lunde (2000)). Taking the logarithm, one gets

$$\begin{aligned} \mathcal{L}(x_1, \dots, x_N; \theta) = & N \ln \left(\frac{\gamma}{\Gamma(\lambda)} \right) - \left[\sum_{i=1}^N \ln(x_i) \right] + \gamma\lambda \left[\sum_{i=1}^N \ln \left(\frac{x_i}{\Psi_i} \right) \right] \\ & + N\gamma\lambda \ln \left(\frac{\Gamma(\lambda + \frac{1}{\gamma})}{\Gamma(\lambda)} \right) - \left(\frac{\Gamma(\lambda + \frac{1}{\gamma})}{\Gamma(\lambda)} \right)^{\gamma} \cdot \left[\sum_{i=1}^N \left(\frac{x_i}{\Psi_i} \right)^{\gamma} \right] \end{aligned}$$

where Ψ_i is specified as in eq.(3). To check the *ACD* model's diagnostics, one can examine the properties of the standardized duration such as the mean of unity or their autocorrelation structure applying the Ljung-Box Test. Further, the theoretical distribution of the residuals implied by the estimated parameters $f(\varepsilon, \hat{\theta})$ can be compared with the empirical one $\hat{f}(\hat{\varepsilon})$. For this purpose, Fernandes and Grammig (2006) developed the D-test to quantify the difference between them, which should be zero under correct model specification.

Having estimated the ACD models, the parameter matrix representing the summarized characteristics all stock's duration patterns will be standardised before computing the distance matrix for the hierarchical cluster analysis. Without restricting ourselves to a specific distance measure or a clustering algorithm, we combine 6 common distance matrices ("euclidean", "manhattan", "canberra", "binary", "maximum" and "minkowski") with 9 agglomeration methods ("ward", "complete", "average", "mcquitty", "median", "single", "centroid", "correlation" and "uncentered"), yielding 54 different cluster results. Following the approach suggested by Shimodaira (2004), we apply his R-package "*pvclust*" (written together with Suzuki, R.) and select that hierarchy maximizing p-values of the cluster edges, indicating the highest reliability of the clustering supported by the data among all 54 combinations.

3 Data Set and Empirical Results

The transaction data of the *FTSE100* stocks is extracted from the SETS limit order book system of the London Stock Exchange, which is an order-driven market.

The sample includes the whole history of all trades in March 2007, observed for 22 trading days over 5 weeks. The continuous trading phase starts after the opening auction at 8 a.m. and ends before the closing auction at 4.30 p.m. The electronic trading is based on an automatic matching algorithm, generally following a strict price-time priority of orders.

Descriptive statistics of the observed and deseasonalised durations of the whole sample are listed in Table 1 and 2. As waiting times are skewed to the right, the kurtosis is not computed. The Hill-estimator for the 95% and 97.5% quantile of the data is provided instead. Likewise the Hurst parameter and the Box-Pierce Q-statistic is computed.

For reasons of a better comparison we restrict the estimation procedure of all models to a $(1, 1)$ specification in the ACD lag structure, whereby the first half of the sample will be used for estimations only. The second half of data represents the out-of-sample for diagnostics checks. In this study, all ACD models detect a cluster structure of trade durations (see Tables 3–5 with the p-values of the parameters in brackets), signaling a certain behavioral patterns of traders across all stocks. Generally, long volume durations tend to be followed by long ones and short durations by short ones, $\hat{\alpha}_1, \hat{\beta}_1 > 0$. As $\hat{\beta}_1 < 1$ in all models, stationarity is ensured, but the duration process shows strong persistence (see Carrasco and Chen (2002) and Fernandes and Grammig (2006)). These findings are in line with the common hypothesis of information-based market microstructure theory, where the trading and ordering process represents a source of information (O’Hara (1997)). The more information that is available in the market, the faster traders have to react. The important economic question here is determining the “best” time to enter the market. According to the theory, long durations suggests that uninformed traders (still) believe that the underlying value of the asset has not changed and only trade because of their own portfolio optimization. Usually, these “noise traders” simply wish to minimize transaction costs. Contrary, short durations and, hence, intensive trading signalize the presence of informed traders who are assumed to make money by capitalizing on their informational advantage.

Figure 1 illustrates the behavior of the news impact curve driven by the remaining parameters estimated from the model. Using six representative stocks from the FTSE100 as an example, stock 3 and stock 6 have the smallest b value, which means the shifting asymmetry is not so obvious. Comparing all panels, we can find that all curves are almost starting from zero except stock 1 and 4. Stock 5 and stock 6 have a negative c value, which means the rotation is clockwise. For the other stock with positive c value, the rotation is counter clockwise. The shape parameter δ indicates either concavity ($\delta \leq 1$) or convexity ($\delta \geq 1$). In this analysis, stock 6 has the largest ν value, greater than 1. It means stock 6 has a convex impact curve, while other stocks have a concave impact curve. As visible in Figure

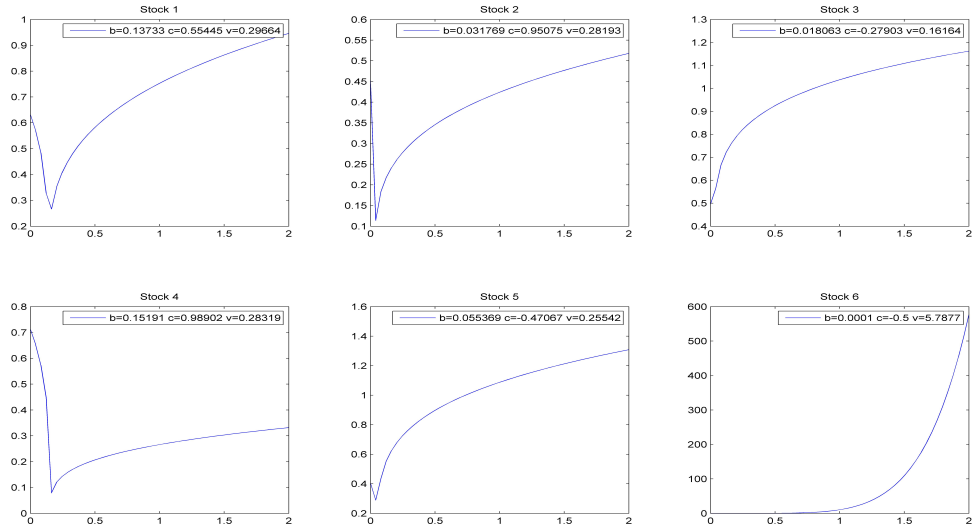


Figure 1: News Impact Curves

1, it is obvious that curve of stock 6 is different from other stocks. The parameters for all *FTSE100* are listed in the appendix tables.

The diagnostics checks of the ACD residuals are reported in Table 6. Although the Ljung-Box test is rejected in many cases, it is to mention that the maximum and minimum values of the ACF are quite low given the fact that only 1 lag was taken into account in the model specification. Hence, in order to include more stocks in the cluster analysis, we refer to the p-value of the D-test, extracting 69 stocks for the subsequent hierarchical agglomeration based on the estimated ACD parameters.

For the identification the of economic sectors to which these stocks belong, we follow the the categorization and industry segmentation given by the Dow Jones Indexes and FTSE. Dow Jones Indexes and FTSE together offer a definitive classification system called the Industry Classification Benchmark (ICB). The system is supported by the ICB Universe Database, which contains over 60,000 companies and 65,000 securities worldwide from the FTSE and Dow Jones universes. The coverage makes the database a comprehensive tool for global sector analysis.

In general, a clear-cut differentiation between all industry sectors could not be found. As discernible in Figure 2, the subset of the selected *FTSE100* stocks, whose trade durations can be successfully captured by an augmented ACD(1,1) model, can be separated in three clusters, as strongly supported by data.

Unfortunately, the first cluster contains too few stocks to allow for a reasonable

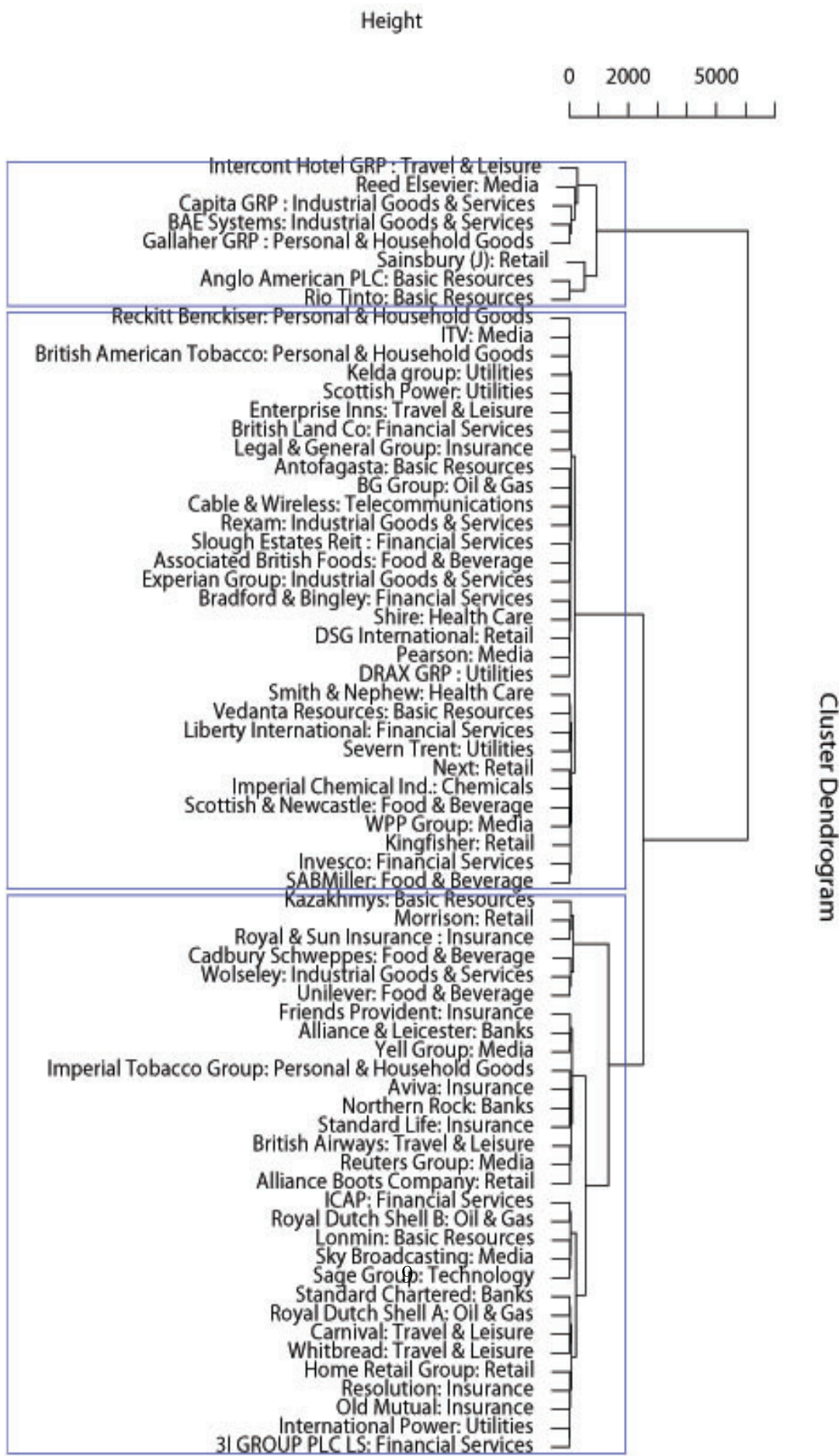


Figure 2: Clusters of stocks with similar duration patterns

interpretation, whereas cluster two and three include several stocks coming from different sectors. At first glance, these results seem confusing as they imply that generally companies from different sectors show similar trade duration patterns. However, when taking a closer look, Figure 2 reveals that stocks belonging to a certain sub-sectors also tend to go to the same cluster. For example, both cluster two and three contain stocks from the super-sector “financial industry”. Interestingly, cluster two mainly include those companies providing “financial services”, whereas cluster three contains first and foremost “insurance” companies and “banks” (with “3I Group” as exemption). Similarly, both cluster two and three include stocks from the super-sector “retail”. Searching for the economic sub-sectors in the ICB database, it will become clear that cluster two only contains “apparel retailer”, whereas cluster three comprises “drug retailers”. Likewise, cluster three comprises stocks from the sectors “travel and leisure” and “food”, while cluster two assimilates the sectors “health care”, “utilities” and “brewers”.

All in all, each cluster contains companies from several super-sectors, however on the sub-sector level a clearer picture appears. These results are very useful in high-frequency trading as they imply that a certain subset of assets have the same duration pattern, allowing a better scheduling of order placements when optimizing a specific trading strategy, e.g. pairs trading. Unfortunately, a clear mapping was not possible for “Media”, “Basic Resources” and “Industry Goods and Service” as these categories include companies from several various sub-sectors.

Figures 3 to 5 show the three clusters in more detail providing two types of p-values for each edge of the cluster (grey) according to the approach proposed by Shimodaira (2004) to test the reliability of the cluster. The numbers on the right of the edge (green) refers to the approximately unbiased p-value and the number on the left (red) to the common bootstrap p-value. The first one is computed by multi-scale bootstrap resampling and represents a better approximation to unbiased p-value than the latter one that is computed by normal bootstrap resampling.

4 Conclusion

This paper investigates whether or not whether different assets from different industry sectors have different duration patterns when it come to trading. The answer to this is essential in high-frequency trading as the similarity of durations will reduce the problem of asynchronous trading and improve the scheduling of order placement.

An augmented ACD model has been estimated to capture the duration cluster patterns for trade durations in a in a limit order book by analyzing the arrival process of trades in the electronic markets. Using transaction data of all 100 FTSE stocks traded at the London Stock Exchange, 69 stocks could be reasonably

modelled by an ACD(1,1) specification and, thus, selected for a subsequent cluster analysis to find similarities of the duration patterns across all stocks in our sample.

As expected, stocks belonging to a certain sub-sector also tend to go to the same cluster. These results are very useful in high-frequency trading as they imply that a certain subset of assets belonging to a certain economic sub-sector have the same duration pattern, allowing a better scheduling of order placements when optimizing a specific trading strategy, e.g. pairs trading. Interestingly, different super-sectors can have similar duration patterns as well, meaning that the speed of market activities and the intensity of information arrival are somehow similar, offering additional measures and indicators when deriving new trading schedules and order submission plans.

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Table 1: Descriptive statistics of raw durations

Stock	Mean	Std.Dev.	Dispersion	Skewness	Hill(0.95)	Hill(0.975)	Hurst	Q(10)	Q(25)
Alliance & Leicester	32.0776	47.3859	1.4772	3.5560	2.6854	3.3225	0.5471	11.2291	30.6064
Antofagasta	23.9655	39.3120	1.6404	3.5298	2.4636	3.2395	0.6272	11.3275	31.2127
DSG International	29.5557	108.1463	3.6591	108.4421	2.3000	2.5968	0.4585	10.0605	25.2911
BHP Billiton	9.4761	22.8550	2.4119	57.5728	2.4577	2.9593	0.6047	10.2377	26.0490
Invesco	22.3298	45.1964	2.0240	6.2851	1.9302	2.3137	0.6312	12.0775	35.7401
British Airways	17.5523	36.3033	2.0683	29.3853	2.2459	2.6127	0.6112	10.8580	29.0788
British Land Co	21.6298	39.4412	1.8235	20.9044	2.4412	2.8893	0.5597	10.5599	27.3935
Sky Broadcasting	28.4273	54.8296	1.9288	18.1461	2.3888	2.8413	0.5233	10.7655	28.8433
Northern Rock	29.9563	49.7446	1.6606	4.5716	2.4275	2.8315	0.5714	11.5322	31.7845
Cable & Wireless	30.6705	49.7356	1.6216	8.3954	2.6194	3.1471	0.5225	11.3514	31.1123
Capita GRP	34.2478	58.2928	1.7021	4.1258	2.3701	2.8985	0.5813	11.4941	32.3061
Aviva	14.1076	33.7643	2.3933	68.9601	2.6152	2.9156	0.5264	10.1915	25.8822
Bradford & Bingley	28.1188	50.4274	1.7934	11.9812	2.4247	2.7540	0.6109	11.2243	30.0589
Reuters Group	19.9384	36.8014	1.8458	7.5136	2.1679	2.5505	0.6481	11.5097	31.6773
Diageo	15.3505	22.6585	1.4761	3.6316	2.5618	3.2135	0.6101	11.6433	33.0756
BAE Systems	16.7979	49.2036	2.9292	111.3921	2.4244	2.8193	0.4825	10.0895	25.4368
British American Tobacco	17.0556	29.1838	1.7111	22.4489	2.5264	3.0821	0.5688	11.0349	29.8090
Gallaher GRP	46.7606	99.7751	2.1337	6.0637	2.0334	2.2562	0.5515	12.0824	34.1481
Hammerson	24.1234	39.3290	1.6303	4.2289	2.3527	2.8280	0.5790	11.2623	30.8847
Standard Chartered	16.9985	32.1418	1.8909	18.5410	2.2613	2.6113	0.5357	11.1262	30.0729
Rexam	35.5775	57.0397	1.6033	7.5966	2.5945	2.9430	0.6110	11.1001	30.1210
Resolution	34.6247	59.8716	1.7292	7.0364	2.4030	2.7089	0.5621	11.4646	30.8411
Imperial Tobacco Group	17.4270	40.5358	2.3260	35.8829	2.2073	2.4759	0.6081	10.4424	26.9694
Imperial Chemical Ind.	20.9629	34.7730	1.6588	4.1013	2.3733	2.8899	0.5259	11.2729	30.5627
Johnson Matthey	28.3259	45.3478	1.6009	5.2173	2.5152	3.0964	0.5888	10.9767	28.9741
SABMiller	25.5526	40.8151	1.5973	3.9273	2.3925	2.9390	0.6171	11.3182	31.4015
Anglo American PLC	10.3166	30.2749	2.9346	72.4484	2.2582	2.6244	0.5276	10.1344	25.5894
Compass Group	25.3253	39.6213	1.5645	3.8826	2.4638	2.9053	0.6471	11.3677	30.7042
HSBC Hldgs	9.8748	53.6198	5.4300	110.9745	2.6183	3.0273	0.4558	10.0041	25.0183
Legal & General Group	20.1606	33.3871	1.6561	8.7997	2.5070	3.0981	0.6376	11.1545	30.1633
Morrison	21.1674	34.6525	1.6371	10.2833	2.5004	3.0964	0.5909	11.0141	29.6804
Cadbury Schweppes	16.9663	60.0921	3.5419	112.9798	2.2481	2.5862	0.5865	10.1009	25.5094
International Power	20.6873	36.7035	1.7742	9.7074	2.3665	3.0312	0.5803	10.9211	29.0253
United Utilities	25.7519	43.5115	1.6896	17.1690	2.5691	3.2881	0.6108	10.7097	28.5189
Royal & Sun Insurance	25.6329	41.9091	1.6350	4.0115	2.5093	2.8740	0.5492	11.5411	32.3904
Associated British Foods	39.4500	64.6565	1.6389	3.8314	2.4383	2.7650	0.6015	11.5940	33.4557
Pearson	23.9888	42.0867	1.7544	12.0877	2.3189	2.7427	0.5512	11.1737	30.0228
Persimmon	29.4265	53.7923	1.8280	19.1198	2.6195	2.9042	0.5450	10.7057	28.2586
Liberty International	33.5247	61.9734	1.8486	10.0515	2.2829	2.5852	0.5141	10.8800	28.8566
Prudential	13.9179	21.8754	1.5718	5.3302	2.4552	2.7632	0.6624	11.7894	33.2317
Rio Tinto	9.4791	21.9674	2.3175	46.6364	2.3635	2.7441	0.5405	10.2811	26.2562
Reckitt Benckiser	18.6718	31.5161	1.6879	7.2312	2.2693	2.7716	0.5665	11.0969	29.9280
Reed Elsevier	25.6955	46.1912	1.7976	9.4046	2.3054	2.6922	0.5261	11.2170	30.3824
Old Mutual	23.6890	43.2535	1.8259	10.1568	2.2691	2.7359	0.5751	11.1389	29.8253
Royal Bank Of Scotland	8.5249	89.2760	10.4724	272.1152	2.6331	2.9190	0.6037	10.0004	25.0018
Scottish & Newcastle	25.3837	41.6945	1.6426	5.5385	2.6426	3.1398	0.6747	12.0661	36.1931
Scottish & Southern Energy	19.4285	197.6771	10.1746	133.1948	2.4862	2.7404	0.4781	10.0005	25.0021
BP	9.0793	59.2372	6.5244	213.3647	2.5907	3.0869	0.4621	10.0022	25.0092
Sage Group	29.0247	48.9532	1.6866	9.2827	2.6035	2.8108	0.5309	11.6370	31.9849
Slough Estates Reit	36.2567	56.9201	1.5699	4.2213	2.5631	3.0828	0.5902	11.3407	30.5036
Smiths Group PLC	28.7885	43.6173	1.5151	3.4372	2.6296	3.2697	0.5300	11.0571	30.3606
Lloyds TSB Group	12.1096	150.4842	12.4268	172.1376	2.7335	3.3085	0.5006	10.0001	25.0005
Tate & Lyle	25.6576	38.5962	1.5043	3.2802	2.7221	3.2564	0.6199	11.1646	30.0851
BG Group	16.9819	31.4357	1.8511	30.0193	2.4648	2.8974	0.6244	10.5884	27.5942
Tesco	12.1195	20.7948	1.7158	40.3550	2.7565	3.1891	0.5549	10.3673	26.5955
Smith & Nephew	25.2736	40.7230	1.6113	3.9840	2.3816	2.8180	0.5936	11.2522	30.6952

cont

Stock	Mean	Std.Dev.	Dispersion	Skewness	Hill(0.95)	Hill(0.975)	Hurst	Q(10)	Q(25)
GlaxoSmithKline	11.7995	98.9255	8.3839	158.5720	2.5981	3.0881	0.5270	10.0007	25.0029
Wolseley	20.2326	36.4425	1.8012	18.2316	2.2675	2.8095	0.5898	10.9932	29.0339
Kelda Group	37.1582	64.1677	1.7269	7.5332	2.4462	3.0647	0.4932	10.7990	28.9930
AstraZeneca	11.0601	26.8049	2.4236	66.8150	2.5367	3.1012	0.5889	10.1544	25.6609
Friends Provident	26.4942	39.3823	1.4865	4.0267	2.6233	3.1376	0.6630	11.6476	33.3251
HBOS	13.5907	124.2362	9.1413	216.2032	2.6013	3.0322	0.5415	10.0006	25.0022
BT Group	15.0042	74.7519	4.9821	183.2606	2.7540	3.1761	0.4680	10.0060	25.0258
Lonmin	25.2060	44.3191	1.7583	5.4590	2.2988	2.6501	0.5586	11.3220	31.1543
Carnival	20.9828	47.3449	2.2564	33.4623	2.1776	2.6328	0.4895	10.5282	27.1116
Marks & Spencer Group	18.6372	32.1965	1.7275	18.9202	2.4042	2.8567	0.5458	10.8251	28.5075
Barclays	8.2660	27.1128	3.2800	125.6167	2.4259	2.8258	0.5957	10.0622	25.2642
Xstrata	10.6699	25.0192	2.3448	41.6097	2.3237	2.8375	0.5242	10.2464	26.1108
Yell Group	33.4419	53.7214	1.6064	4.3403	2.4873	2.9629	0.5319	11.1563	29.4442
Land Securities Group	21.2727	39.2420	1.8447	22.5486	2.4637	2.6528	0.6031	10.4615	26.9234
Next	18.5173	37.0405	2.0003	19.0591	2.2562	2.6506	0.6196	10.7362	28.4105
Cairn Energy	28.1359	45.0323	1.6005	4.0290	2.3151	2.8199	0.6656	11.7298	33.3098
Rolls-Royce Group	19.9239	34.1615	1.7146	18.7517	2.4905	3.0451	0.5526	10.5184	27.0350
Kingfisher	21.1573	37.7000	1.7819	9.3582	2.3142	2.7518	0.6266	11.2888	31.6304
Vedanta Resources	27.8622	52.1867	1.8730	14.0456	2.3934	2.7863	0.5547	10.6850	27.8675
Hanson Company	27.0055	44.9090	1.6630	4.6645	2.4415	2.9280	0.5475	11.3218	30.7787
ICAP	28.7460	49.5832	1.7249	4.8012	2.2422	2.6540	0.5224	11.6296	32.5586
ITV	32.9747	49.5806	1.5036	3.7237	2.5869	3.2234	0.5923	11.5084	31.3504
Sainsbury (J)	19.2780	37.9328	1.9677	20.7754	2.3896	2.8267	0.5962	10.7928	28.7451
Centrica	19.1139	31.5312	1.6496	16.5668	2.4560	2.8848	0.6010	10.7163	27.8007
Royal Dutch Shell A	23.0459	46.2872	2.0085	13.1693	2.2032	2.5872	0.5403	11.7022	32.5976
Royal Dutch Shell B	13.5378	24.9097	1.8400	30.8547	2.5373	3.1023	0.5913	10.6537	28.0097
National Grid	19.1000	33.6703	1.7628	35.9257	2.6524	3.1435	0.5768	10.5255	27.2459
Kazakhmys	33.1500	55.2883	1.6678	4.1109	2.3494	2.8351	0.5353	11.0548	29.8287
WPP Group	19.6351	33.1865	1.6902	7.0040	2.2843	2.8078	0.6737	11.5284	31.7241
Shire	26.8486	48.6823	1.8132	5.7336	2.2747	2.6453	0.5266	11.8190	32.7098
Alliance Boots Company	18.6105	39.5202	2.1235	18.6989	2.1054	2.4384	0.6048	10.9456	29.2685
Unilever	17.9646	29.9723	1.6684	8.0180	2.5660	2.8899	0.6444	11.5257	32.3138
Scottish Power	14.8414	28.0012	1.8867	34.8035	2.5775	2.9312	0.5525	10.5189	27.2731
Intercont Hotel GRP	32.8640	82.7593	2.5182	58.7454	2.2740	2.7158	0.5298	10.3013	26.3107
Man Group	16.1084	26.7860	1.6629	4.9509	2.1795	2.6032	0.6703	11.9194	33.4016
Vodafone Group	10.5792	111.2353	10.5145	246.6701	2.6469	3.1082	0.4659	10.0004	25.0017
Standard Life	40.0484	71.1291	1.7761	6.6216	2.3752	2.7241	0.6441	11.9004	33.1019
3I GROUP PLC	24.8855	44.0638	1.7707	10.4275	2.3638	2.5914	0.6408	11.4834	31.1677
Home Retail Group	33.2263	55.1342	1.6594	5.7960	2.5058	2.8879	0.5592	11.7303	32.3973
Experian Group	30.6858	64.6820	2.1079	49.8401	2.5974	3.1237	0.4990	10.5085	26.9579
DRAX GRP	34.7121	58.8856	1.6964	5.0236	2.4121	2.6942	0.5766	11.2587	30.4060
Severn Trent	34.8031	60.2337	1.7307	10.0603	2.5606	3.0023	0.5236	11.0678	29.8376
Whitbread	28.1377	47.9939	1.7057	6.3269	2.4210	2.9334	0.6717	11.3224	31.0139
Enterprise Inns	34.8678	59.7333	1.7131	6.9767	2.3804	2.7861	0.5766	11.5040	31.9102

Table 2: Descriptive statistics of deseasonalized durations

Stock	Mean	Std.Dev.	Dispersion	Skewness	Hill(0.95)	Hill(0.975)	Hurst	Q(10)	Q(25)
Alliance & Leicester	0.9982	1.3739	1.3763	3.1115	3.0087	3.6701	0.2075	10.6664	27.8686
Antofagasta	1.0001	1.5389	1.5387	3.1527	2.7340	3.4362	0.6510	10.7369	28.2479
DSG International	1.0027	2.7857	2.7783	90.8945	2.5480	2.9266	0.5096	10.0707	25.2997
BHP Billiton	1.0017	2.2798	2.2758	56.5832	2.6056	3.1258	0.5686	10.1764	25.7283
Invesco	0.9959	1.8400	1.8476	5.5523	2.1239	2.6027	0.4196	11.5370	32.2544
British Airways	1.0018	1.9047	1.9012	26.5724	2.5236	2.9006	0.6389	10.7058	28.1911
British Land Co	1.0013	1.6578	1.6556	15.8248	2.6145	3.0605	0.5794	10.4065	26.6309
Sky Broadcasting	0.9995	1.8043	1.8052	21.2571	2.6320	2.9695	0.5810	10.3272	26.5225
Northern Rock	1.0002	1.5093	1.5091	3.8733	2.5224	3.0218	0.6237	10.8251	28.3194
Cable & Wireless	0.9992	1.4618	1.4630	6.7211	2.8107	3.3928	0.5774	10.6000	27.4217
Capita GRP	0.9988	1.5526	1.5544	3.5574	2.5473	2.9325	0.6355	10.8479	28.8318
Aviva	1.0014	2.1153	2.1124	60.2420	2.7981	3.2319	0.3647	10.1602	25.6802
Bradford & Bingley	1.0024	1.6544	1.6505	8.3949	2.5755	2.9307	0.6429	10.9211	28.5723
Reuters Group	1.0004	1.6595	1.6589	6.0529	2.4232	2.7708	0.6922	10.9886	29.0105
Diageo	0.9967	1.3581	1.3626	3.2244	2.8527	3.3090	0.5095	10.7648	28.2005
BAE Systems	1.0023	2.4456	2.4400	95.1829	2.6226	3.0752	0.3843	10.0957	25.4266
British American Tobacco	1.0000	1.6616	1.6617	29.2981	2.6881	3.3473	0.5872	10.5420	27.2490
Gallaher GRP	0.9973	1.9108	1.9160	5.6759	2.2170	2.5358	0.6249	11.3546	30.2278
Hammerson	0.9998	1.5081	1.5084	3.6139	2.6333	3.0056	0.6183	10.6938	27.9245
Standard Chartered	1.0000	1.8322	1.8323	21.1928	2.3824	2.7848	0.5565	10.7947	28.3783
Rexam	1.0009	1.4551	1.4538	5.2242	2.7312	3.3789	0.6592	10.6986	28.0913
Resolution	1.0009	1.6174	1.6160	5.8207	2.6406	3.0141	0.5903	11.0348	28.9167
Imperial Tobacco Group	1.0017	1.9770	1.9737	24.3424	2.3437	2.7327	0.4519	10.4980	27.1721
Imperial Chemical Ind.	0.9991	1.5532	1.5546	3.6339	2.4982	3.1354	0.5391	10.7815	28.1935
Johnson Matthey	1.0007	1.5393	1.5382	4.9421	2.6267	3.3268	0.5980	10.7265	27.8323
SABMiller	0.9974	1.5012	1.5050	3.5811	2.6530	3.0430	0.6520	10.7762	28.4741
Anglo American PLC	1.0029	2.4098	2.4029	57.9391	2.4991	2.9073	0.5621	10.1619	25.6554
Compass Group	0.9981	1.4650	1.4677	3.4130	2.6512	3.0682	0.6754	10.8401	28.1189
HSBC Hldgs	1.0004	3.5238	3.5226	98.4104	2.7694	3.2039	0.4509	10.0155	25.0681
Legal & General Group	0.9992	1.5406	1.5419	7.8263	2.7059	3.2373	0.6701	10.7309	28.0279
Morrison	0.9998	1.5841	1.5843	12.0399	2.7125	3.1945	0.6005	10.6504	27.7471
Cadbury Schweppes	1.0014	2.6923	2.6884	87.2915	2.3856	2.8354	0.6450	10.1743	25.8319
International Power	1.0003	1.6689	1.6684	8.1123	2.5159	3.0878	0.2686	10.6986	27.8796
United Utilities	0.9991	1.5655	1.5669	16.9968	2.8255	3.4171	0.6658	10.3284	26.4383
Royal & Sun Insurance	0.9994	1.4976	1.4985	3.7199	2.6671	3.0293	0.6013	10.7311	28.2355
Associated British Foods	1.0008	1.4753	1.4742	3.3057	2.6767	3.2061	0.6683	10.6759	28.5332
Pearson	1.0006	1.5913	1.5903	9.3064	2.5906	3.0527	0.5979	10.6923	27.5812
Persimmon	0.9998	1.7559	1.7562	21.9796	2.7016	3.2011	0.5659	10.3891	26.6817
Liberty International	1.0018	1.7210	1.7179	9.3699	2.4874	2.7568	0.5431	10.5896	27.3733
Prudential	0.9989	1.4831	1.4848	5.8398	2.6941	3.0683	0.6816	11.1327	29.7425
Rio Tinto	1.0015	2.0689	2.0657	40.9082	2.5994	3.0134	0.4977	10.2076	25.8320
Reckitt Benckiser	1.0002	1.5584	1.5581	6.1122	2.5532	2.9495	0.5908	10.5887	27.3546
Reed Elsevier	1.0004	1.6611	1.6604	9.0293	2.4624	2.9278	0.5637	10.8354	28.2472
Old Mutual	1.0008	1.6323	1.6310	7.5072	2.4962	3.0202	0.6221	10.6290	27.3190
Royal Bank Of Scotland	1.0025	7.8557	7.8365	267.1698	2.7261	3.1428	0.6297	10.0010	25.0042
Scottish & Newcastle	0.9988	1.5375	1.5393	4.8947	2.8041	3.2889	0.7128	11.5952	33.5685
Scottish & Southern Energy	0.9990	3.8055	3.8094	111.1431	2.6593	2.9899	0.3486	10.0181	25.0724
BP	1.0017	4.8512	4.8432	205.0974	2.8505	3.4296	0.5246	10.0033	25.0121
Sage Group	1.0008	1.5950	1.5938	8.6997	2.6445	3.1214	0.5523	11.1468	29.6083
Slough Estates Reit	0.9988	1.4677	1.4694	3.8225	2.7242	3.2622	0.6414	10.7597	27.9487
Smiths Group PLC	0.9983	1.4099	1.4123	2.9773	2.8149	3.5156	0.5595	10.5107	27.2981
Lloyds TSB Group	0.9995	6.5625	6.5655	165.5696	2.9022	3.4205	0.5467	10.0015	25.0055
Tate & Lyle	0.9972	1.4488	1.4528	3.0638	2.9263	3.3745	0.6271	10.7963	28.3150
BG Group	1.0008	1.7440	1.7425	27.6140	2.6080	3.0273	0.6493	10.4188	26.7677
Tesco	1.0002	1.6710	1.6706	44.6802	2.9324	3.4321	0.5537	10.1846	25.6794
Smith & Nephew	0.9996	1.4976	1.4981	3.4260	2.6345	3.2623	0.2901	10.7507	28.1498

cont

Stock	Mean	Std.Dev.	Dispersion	Skewness	Hill(0.95)	Hill(0.975)	Hurst	Q(10)	Q(25)
GlaxoSmithKline	1.0003	4.2283	4.2268	142.4248	2.8751	3.3176	0.5744	10.0074	25.0282
Wolseley	0.9998	1.7025	1.7028	16.0073	2.4033	2.9386	0.3996	10.7659	27.9601
Kelda Group	0.9984	1.6010	1.6036	7.3290	2.5600	3.1698	0.5254	10.4170	26.9170
AstraZeneca	1.0018	2.0650	2.0612	52.7831	2.7391	3.2014	0.4616	10.1518	25.5920
Friends Provident	0.9980	1.4227	1.4255	4.3427	2.7983	3.1119	0.6858	11.1174	30.4852
HBOS	1.0028	6.4248	6.4069	209.8382	2.8132	3.1838	0.5678	10.0019	25.0067
BT Group	1.0021	3.4320	3.4246	164.5762	2.9414	3.3708	0.5049	10.0154	25.0608
Lonmin	1.0004	1.6147	1.6140	4.3559	2.3958	2.8692	0.1907	10.7481	28.2477
Carnival	1.0020	1.7120	1.7086	8.6018	2.4159	2.8462	0.5485	10.6794	27.7002
Marks & Spencer Group	1.0003	1.6340	1.6334	20.5065	2.5958	3.1039	0.3602	10.5018	26.9177
Barclays	1.0020	3.1782	3.1718	126.5368	2.5932	2.9534	0.6166	10.0444	25.1738
Xstrata	1.0017	2.1589	2.1552	36.5146	2.4761	2.8153	0.2356	10.2286	26.0064
Yell Group	0.9999	1.4705	1.4706	3.5012	2.8948	3.3761	0.5675	10.6560	27.3571
Land Securities Group	1.0010	1.6674	1.6657	17.5785	2.5715	2.9164	0.6489	10.3124	26.1596
Next	1.0018	1.6841	1.6811	10.1375	2.6244	2.9553	0.6743	10.5717	27.5251
Cairn Energy	0.9964	1.4971	1.5024	3.7999	2.5627	2.9759	0.6981	11.1380	30.3493
Rolls-Royce Group	1.0005	1.5755	1.5747	12.6410	2.6988	3.1386	0.3459	10.3644	26.3142
Kingfisher	0.9994	1.6534	1.6544	11.4614	2.5256	2.9692	0.6667	10.7596	28.6827
Vedanta Resources	1.0007	1.7611	1.7599	11.0009	2.5177	2.8348	0.5819	10.5607	27.3090
Hanson Company	0.9984	1.5621	1.5647	3.9739	2.4787	3.0581	0.5660	10.8551	28.5390
ICAP	1.0010	1.6009	1.5993	3.9694	2.3856	2.9563	0.5490	11.0952	29.7144
ITV	0.9989	1.4189	1.4205	3.3784	2.7742	3.3024	0.6209	10.9519	28.7094
Sainsbury (J)	1.0020	1.8518	1.8481	19.3196	2.5034	2.8766	0.6195	10.6715	28.0106
Centrica	1.0005	1.5438	1.5430	14.0590	2.5938	3.0172	0.4528	10.4613	26.6677
Royal Dutch Shell A	0.9983	1.9195	1.9228	20.7801	2.3848	2.8215	0.1962	10.7717	28.1597
Royal Dutch Shell B	0.9998	1.8373	1.8377	39.1527	2.7509	3.2208	0.1555	10.3571	26.5555
National Grid	0.9995	1.6144	1.6152	31.1536	2.8408	3.3210	0.6186	10.3302	26.2233
Kazakhmys	0.9985	1.5979	1.6003	3.7216	2.6007	3.1929	0.5555	10.7489	28.2029
WPP Group	0.9995	1.6045	1.6052	6.5161	2.4409	2.9517	0.2894	11.1297	29.6691
Shire	0.9975	1.7334	1.7377	9.2781	2.3436	2.8002	0.2068	10.9664	28.6207
Alliance Boots Company	1.0023	1.9743	1.9699	16.7770	2.2520	2.6999	0.2303	10.7992	28.4962
Unilever	0.9982	1.5800	1.5829	9.9277	2.6539	3.0309	0.6787	10.7532	28.1985
Scottish Power	1.0007	1.6922	1.6910	25.5788	2.8406	3.1565	-0.0688	10.5574	27.2208
Intercont Hotel GRP	1.0013	2.0186	2.0160	39.3803	2.5313	3.1035	0.5928	10.3281	26.3324
Man Group	0.9987	1.5502	1.5522	4.4456	2.4023	2.7590	0.7009	11.3610	30.5654
Vodafone Group	1.0020	6.8185	6.8048	239.0955	2.7628	3.2855	0.3634	10.0015	25.0056
Standard Life	0.9978	1.7048	1.7085	7.1119	2.4818	2.7580	0.6583	11.4338	30.8470
3I GROUP PLC	1.0018	1.6899	1.6869	10.3176	2.4980	2.7463	0.2830	11.0637	29.2002
Home Retail Group	0.9991	1.4908	1.4921	3.9254	2.6548	3.1059	0.3246	11.0714	29.3143
Experian Group	1.0014	1.6339	1.6316	22.1195	2.7484	3.1652	0.5523	10.6194	27.2382
DRAX GRP	0.9990	1.5740	1.5756	4.2324	2.5283	2.8720	0.6125	10.8529	28.5189
Severn Trent	1.0001	1.6137	1.6136	10.5322	2.7061	3.1551	0.5638	10.5663	27.3923
Whitbread	0.9982	1.6177	1.6207	5.1591	2.5453	3.1173	0.1849	10.9694	29.2688
Enterprise Inns	0.9991	1.5460	1.5473	5.5943	2.6674	3.2077	0.2845	10.8743	28.7451

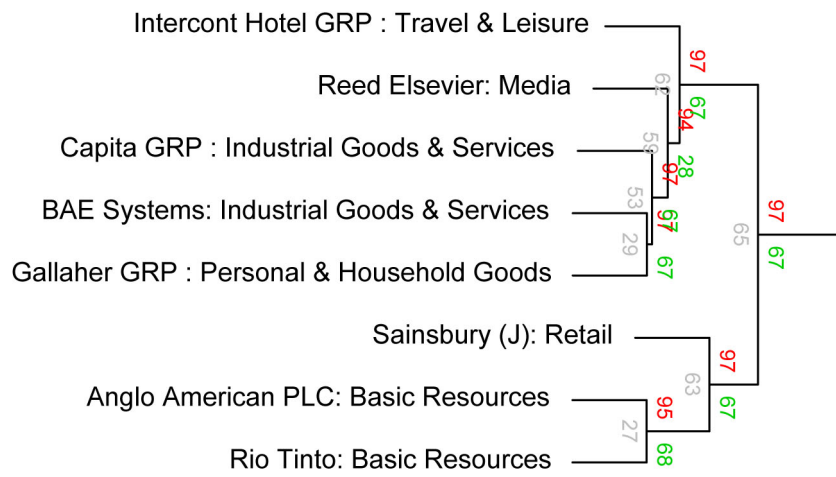


Figure 3: 1st Cluster of stocks with similar ACD parameter settings



Figure 4: 2nd Cluster of stocks with similar ACD parameter settings

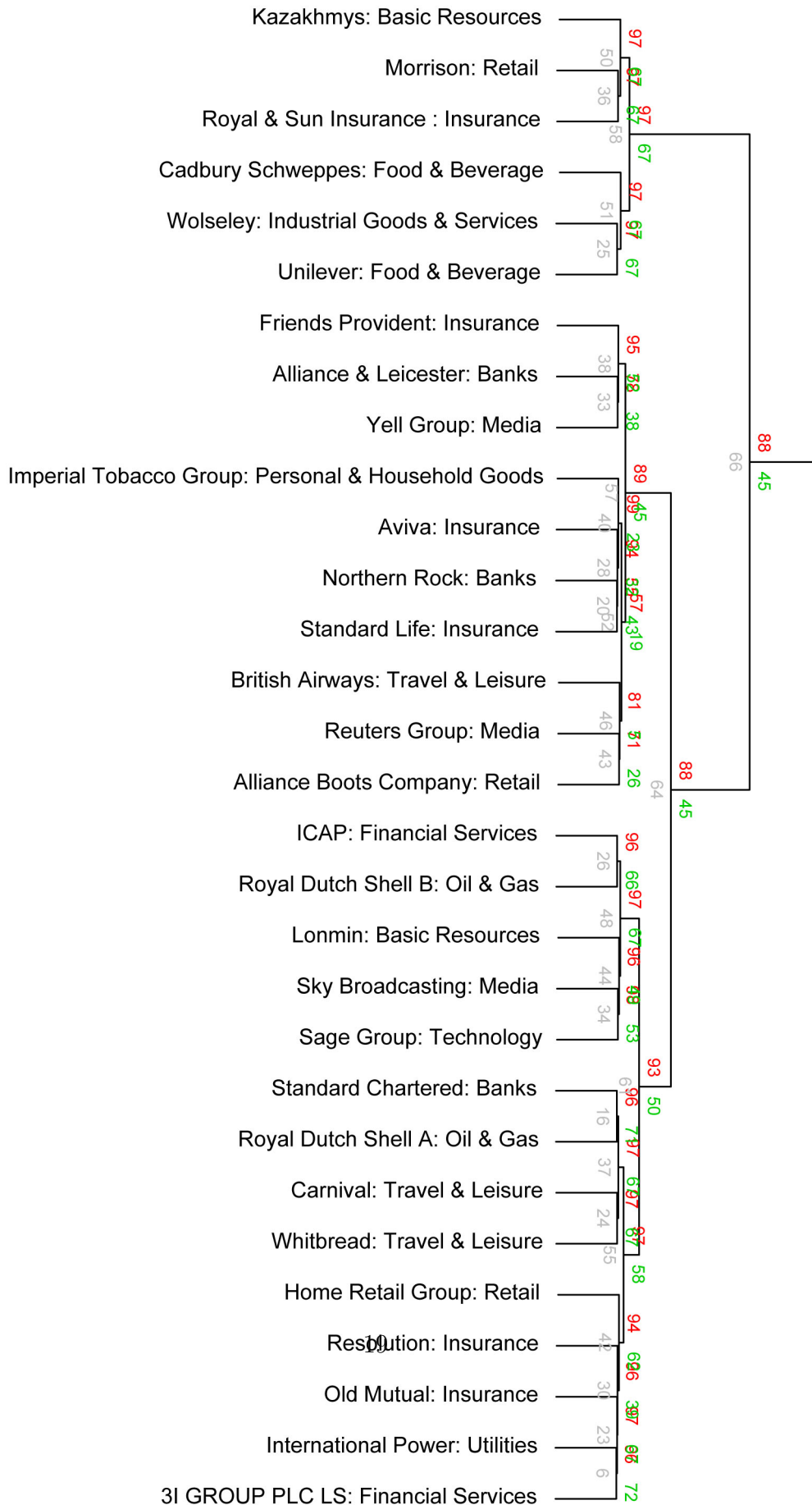


Figure 5: 3rd Cluster of stocks with similar ACD parameter settings

Table 3: Estimated parameters of Augmented ACD models in the first cluster

Sector	Stock	ω	α	β	b	c	δ	ν	γ	λ
Basic Resources	Anglo American PLC	0.0625 (0.0000)	0.2100 (0.0000)	0.7280 (0.0000)	0.0001 (0.0005)	-0.4910 (0.0000)	0.0036 (0.0000)	0.0018 (0.0000)	0.1000 (0.0000)	68.7000 (0.0000)
Basic Resources	Rio Tinto	0.0621 (0.0000)	0.7250 (0.0000)	0.2140 (0.0000)	0.0001 (0.0026)	-0.3670 (0.0000)	0.0102 (0.0000)	0.0016 (0.0000)	0.1040 (0.0000)	68.0000 (0.0000)
Industrial Goods & Services	Capita GRP	0.0545 (0.0000)	0.0039 (0.0000)	0.9420 (0.0000)	0.0509 (0.0000)	1.0000 (0.0000)	0.0149 (0.0000)	0.2690 (0.0000)	0.1280 (0.0000)	24.6000 (0.0000)
Industrial Goods & Services	BAE Systems	0.0444 (0.0000)	0.0630 (0.0000)	0.8950 (0.0000)	0.0001 (0.1120)	-0.3810 (0.0000)	0.0232 (0.0000)	0.0326 (0.0000)	0.1160 (0.0000)	44.6000 (0.0000)
Media	Reed Elsevier	0.0913 (0.0000)	0.1420 (0.0000)	0.7910 (0.0000)	0.1080 (0.0000)	0.5210 (0.0000)	0.2880 (0.0000)	0.2410 (0.0000)	0.1380 (0.0000)	23.7000 (0.0000)
Personal & Household Goods	Gallaher GRP	0.1250 (0.0000)	0.0900 (0.0000)	0.8020 (0.0000)	0.0181 (0.0000)	-0.2790 (0.0000)	0.0680 (0.0000)	0.1620 (0.0000)	0.1440 (0.0000)	19.3000 (0.0000)
Retail	Sainsbury (J)	0.0446 (0.0000)	0.5480 (0.0000)	0.4100 (0.0000)	0.0001 (0.4350)	-0.3400 (0.0000)	0.0191 (0.0000)	0.0037 (0.0000)	0.1150 (0.0000)	44.4000 (0.0000)
Travel & Leisure	Intercont Hotel GRP	0.0066 (0.0319)	0.1770 (0.9490)	0.3780 (0.9460)	0.0001 (1.0000)	1.0000 (0.9710)	7.2600 (0.8680)	1.9300 (0.8000)	0.1460 (0.7990)	21.8000 (0.9020)

Table 4: Estimated parameters of Augmented ACD models in the 2nd cluster

Sector	Stock	ω	α	β	b	c	δ	ν	γ	λ
Basic Resources	Antofagasta	0.0439 (0.0000)	0.0046 (0.0000)	0.9530 (0.0000)	0.0096 (0.0000)	-0.1670 (0.0000)	0.0168 (0.0000)	0.3120 (0.0000)	0.1900 (0.0000)	12.6000 (0.0000)
Basic Resources	Vedanta Resources	0.0918 (0.0000)	0.0463 (0.0000)	0.8680 (0.0000)	0.1440 (0.0000)	0.9470 (0.0000)	0.1580 (0.0000)	0.3070 (0.0000)	0.1400 (0.0000)	24.0000 (0.0000)
Chemicals	Imperial Chemical Ind.	0.0528 (0.0000)	0.0376 (0.0000)	0.9230 (0.0000)	0.0272 (0.0000)	-0.3850 (0.0000)	0.1130 (0.0000)	0.4400 (0.0000)	0.1170 (0.0000)	37.6000 (0.0000)
Financial Services	Invesco	0.0259 (0.0000)	0.0024 (0.0000)	0.9730 (0.0000)	0.0172 (0.0000)	-0.5000 (0.0000)	0.0078 (0.0000)	0.3520 (0.0000)	0.1370 (0.0000)	24.7000 (0.0000)
Financial Services	British Land Co	0.0401 (0.0000)	0.0040 (0.0000)	0.9570 (0.0000)	0.0197 (0.0000)	-0.5000 (0.0000)	0.0110 (0.0000)	0.3610 (0.0000)	0.2040 (0.0000)	13.0000 (0.0000)
Financial Services	Bradford & Bingley	0.0721 (0.0000)	0.0056 (0.0000)	0.9220 (0.0000)	0.0318 (0.0000)	0.9510 (0.0000)	0.0141 (0.0000)	0.2820 (0.0000)	0.1880 (0.0000)	14.3000 (0.0000)
Financial Services	Liberty International	0.1030 (0.0000)	0.0584 (0.0000)	0.8480 (0.0000)	0.0820 (0.0000)	0.4410 (0.0000)	0.1530 (0.0000)	0.3150 (0.0000)	0.1850 (0.0000)	12.4000 (0.0000)
Financial Services	Slough Estates Reit	0.0660 (0.0000)	0.2830 (0.0000)	0.7430 (0.0000)	0.0398 (0.0000)	-0.4790 (0.0000)	0.7130 (0.0000)	0.3030 (0.0000)	0.3280 (0.0000)	4.6100 (0.0000)
Brewer	SABMiller	0.0307 (0.0000)	0.1220 (0.0000)	0.8910 (0.0000)	0.0177 (0.0000)	-0.5000 (0.0000)	0.3660 (0.0000)	0.3260 (0.0000)	0.1550 (0.0000)	20.1000 (0.0000)
Brewer	Scottish & Newcastle	0.2290 (0.0000)	0.4880 (0.0000)	0.3730 (0.0000)	0.1240 (0.0000)	0.7350 (0.0000)	0.6940 (0.0000)	0.1590 (0.0000)	0.2680 (0.0000)	7.0200 (0.0000)
Food & Beverage	Associated British Foods	0.0180 (0.0000)	0.0472 (0.0000)	0.9530 (0.0000)	0.0079 (0.0000)	-0.5000 (0.0000)	0.2070 (0.0000)	0.4080 (0.0016)	0.3690 (0.0000)	3.5700 (0.0000)
Health Care	Smith & Nephew	0.0619 (0.0000)	0.0097 (0.0000)	0.9290 (0.0000)	0.0800 (0.0000)	0.9610 (0.0000)	0.0416 (0.0000)	0.3140 (0.0000)	0.1670 (0.0000)	17.7000 (0.0000)
Health Care	Shire	0.0780 (0.0000)	0.1160 (0.0000)	0.8400 (0.0000)	0.0431 (0.0000)	-0.2320 (0.0000)	0.3320 (0.0000)	0.4210 (0.0000)	0.1890 (0.0000)	14.2000 (0.0000)
Industrial Goods & Services	Rexam	0.0456 (0.0000)	0.0069 (0.0000)	0.9500 (0.0000)	0.0150 (0.0000)	-0.5000 (0.0000)	0.0218 (0.0000)	0.5220 (0.0000)	0.3990 (0.0000)	3.2500 (0.0000)
Industrial Goods & Services	Experian Group	0.0785 (0.0000)	0.0040 (0.0000)	0.9190 (0.0000)	0.0167 (0.0000)	-0.5000 (0.0000)	0.0080 (0.0000)	0.3990 (0.0000)	0.3250 (0.0000)	5.3600 (0.0000)
Insurance	Legal & General Group	0.0891 (0.0000)	0.0093 (0.0000)	0.9050 (0.0000)	0.0349 (0.0000)	-0.5000 (0.0000)	0.0183 (0.0000)	0.3430 (0.0000)	0.2000 (0.0000)	13.6000 (0.0000)

cont

Sector	Stock	ω	α	β	b	c	δ	ν	γ	λ
Media	Pearson	0.0510 (0.0000)	0.0072 (0.0000)	0.9420 (0.0000)	0.0594 (0.0000)	0.9970 (0.0000)	0.0477 (0.0000)	0.4890 (0.0000)	0.2350 (0.0000)	9.2300 (0.0000)
Media	ITV	0.1240 (0.0000)	0.0129 (0.0000)	0.8650 (0.0000)	0.0442 (0.0000)	0.2800 (0.0000)	0.0297 (0.0000)	0.3190 (0.0000)	0.3850 (0.0000)	3.6000 (0.0000)
Media	WPP Group	0.0700 (0.0000)	0.1590 (0.0000)	0.8000 (0.0000)	0.1170 (0.0000)	0.2320 (0.0000)	0.4640 (0.0000)	0.2420 (0.0000)	0.1630 (0.0000)	19.5000 (0.0000)
Oil & Gas	BG Group	0.0588 (0.0000)	0.0121 (0.0028)	0.9290 (0.0000)	0.0217 (0.0000)	1.0000 (0.0000)	0.0273 (0.4586)	0.2060 (0.0000)	0.1530 (0.0000)	24.7000 (0.0000)
Personal & Household Goods	British American Tobacco	0.0374 (0.0000)	0.0061 (0.0000)	0.9580 (0.0000)	0.2140 (0.0000)	1.0000 (0.0000)	0.0400 (0.0000)	0.3660 (0.0000)	0.2800 (0.0000)	7.2000 (0.0000)
Personal & Household Goods	Reckitt Benckiser	0.0169 (0.0000)	0.2920 (0.0000)	0.7310 (0.0000)	0.0662 (0.0000)	0.4940 (0.0000)	1.1200 (0.0000)	0.2100 (0.0000)	0.1000 (0.0000)	52.7000 (0.0000)
Retail	DSG International	0.0699 (0.0000)	0.0011 (0.0000)	0.9290 (0.0000)	0.0398 (0.0000)	0.6510 (0.0000)	0.0042 (0.0000)	0.3570 (0.0000)	0.2860 (0.0000)	5.8300 (0.0000)
Retail	Next	0.0359 (0.0000)	0.0063 (0.0000)	0.9590 (0.0000)	0.1430 (0.0000)	0.9920 (0.0000)	0.0403 (0.0000)	0.2530 (0.0000)	0.1470 (0.0000)	23.4000 (0.0000)
Retail	Kingfisher	0.0866 (0.9830)	1.0000 (0.0000)	0.4780 (0.9700)	0.0001 (1.0000)	-0.5000 (0.9690)	10.0000 (0.0000)	5.7900 (0.7690)	0.1570 (0.0000)	21.0000 (0.0633)
Telecommunications	Cable & Wireless	0.0242 (0.0000)	0.0011 (0.0000)	0.9750 (0.0000)	0.0269 (0.0000)	0.6650 (0.0000)	0.0078 (0.0000)	0.4450 (0.0000)	0.3500 (0.0000)	4.2700 (0.0000)
Travel & Leisure	Enterprise Inns	0.0797 (0.0000)	0.0047 (0.0000)	0.9180 (0.0000)	0.0165 (0.0000)	-0.4800 (0.0000)	0.0124 (0.0000)	0.4500 (0.0000)	0.4390 (0.0000)	2.6200 (0.0000)
Utilities	Kelda group	0.0116 (0.0000)	0.0359 (0.0000)	0.9570 (0.0000)	0.0315 (0.0000)	0.6380 (0.0000)	0.3570 (0.0000)	0.3130 (0.0000)	0.2380 (0.0000)	7.1900 (0.0000)
Utilities	Scottish Power	0.0763 (0.0000)	0.2390 (0.0000)	0.7600 (0.0000)	0.0298 (0.0000)	-0.5000 (0.0000)	0.2840 (0.0000)	0.2800 (0.0000)	0.1000 (0.0000)	62.8000 (0.0000)
Utilities	DRAX GRP	0.0895 (0.0000)	0.0048 (0.0000)	0.9060 (0.0000)	0.0656 (0.0000)	1.0000 (0.0000)	0.0146 (0.0000)	0.3180 (0.0000)	0.2250 (0.0000)	9.1900 (0.0000)
Utilities	Severn Trent	0.0431 (0.0000)	0.1810 (0.0000)	0.7720 (0.0000)	0.0309 (0.0000)	1.0000 (0.0000)	0.8070 (0.0000)	0.3990 (0.0000)	0.2120 (0.0000)	10.7000 (0.0000)

Table 5: Estimated parameters of Augmented ACD models in the 3rd cluster

Sector	Stock	ω	α	β	b	c	δ	ν	γ	λ
Banks	Alliance & Leicester	0.0458 (0.0000)	0.0015 (0.0000)	0.9530 (0.0000)	0.0141 (0.0000)	-0.4980 (0.0000)	0.0039 (0.0000)	0.4050 (0.0000)	0.3230 (0.0000)	4.8100 (0.0000)
Banks	Northern Rock	0.1100 (0.0000)	0.0157 (0.0000)	0.8800 (0.0000)	0.0129 (0.0000)	-0.5000 (0.0000)	0.0257 (0.0000)	0.3110 (0.0000)	0.1840 (0.0000)	14.1000 (0.0000)
Banks	Standard Chartered	0.0497 (0.0000)	0.2830 (0.0000)	0.7490 (0.0000)	0.0554 (0.0000)	-0.4710 (0.0000)	0.5600 (0.0000)	0.2550 (0.0000)	0.1370 (0.0000)	31.1000 (0.0000)
Basic Resources	Lonmin	0.0304 (0.0000)	0.3470 (0.0000)	0.6250 (0.0000)	0.0001 (0.0048)	0.8940 (0.0000)	0.0848 (0.0000)	0.0198 (0.0000)	0.1000 (0.0000)	46.7000 (0.0000)
Basic Resources	Kazakhmys	0.0730 (0.0000)	0.0653 (0.0000)	0.8700 (0.0000)	0.0649 (0.0000)	0.9140 (0.0000)	0.2390 (0.0000)	0.3140 (0.0000)	0.1520 (0.0000)	18.6000 (0.0000)
Financial Services	ICAP	0.0587 (0.0000)	0.0095 (0.0000)	0.9330 (0.0000)	0.0217 (0.0000)	0.1240 (0.0000)	0.0209 (0.0000)	0.2590 (0.0000)	0.1790 (0.0000)	14.6000 (0.0000)
Financial Services	3I GROUP PLC LS	0.0344 (0.0000)	0.0044 (0.0000)	0.9630 (0.0000)	0.0159 (0.0000)	-0.5000 (0.0000)	0.0132 (0.0000)	0.2830 (0.0000)	0.1340 (0.0000)	26.1000 (0.0000)
Food & Beverage	Cadbury Schweppes	0.0296 (0.0000)	0.3660 (0.0000)	0.6590 (0.0000)	0.2300 (0.0000)	0.7530 (0.0000)	1.0700 (0.0000)	0.2130 (0.0000)	0.1000 (0.0000)	58.4000 (0.0000)
Food & Beverage	Unilever	0.1570 (0.0000)	0.5640 (0.0000)	0.2800 (0.0000)	0.0001 (0.9700)	0.8960 (0.0000)	0.0007 (0.9800)	0.0002 (0.9800)	0.1450 (0.0000)	24.8000 (0.0000)
Industrial Goods & Services	Wolseley	0.0648 (0.0000)	0.0029 (0.0000)	0.9330 (0.0000)	0.0156 (0.0000)	-0.4620 (0.0000)	0.0055 (0.0000)	0.3140 (0.0000)	0.1420 (0.0000)	24.8000 (0.0000)
Insurance	Aviva	0.0479 (0.0000)	0.0188 (0.0000)	0.9390 (0.0000)	0.0333 (0.0000)	-0.5000 (0.0000)	0.0426 (0.0000)	0.3000 (0.0000)	0.1430 (0.0000)	31.1000 (0.0000)
Insurance	Resolution	0.0782 (0.0000)	0.9210 (0.0000)	0.0012 (0.0000)	0.0001 (0.9810)	0.9700 (0.0000)	0.0023 (0.5470)	0.0003 (0.5280)	0.2650 (0.0000)	6.4900 (0.0000)
Insurance	Royal & Sun Insurance	0.0897 (0.0000)	0.0165 (0.0000)	0.8950 (0.0000)	0.0582 (0.0000)	0.9920 (0.0000)	0.0474 (0.0000)	0.2820 (0.0000)	0.1740 (0.0000)	16.7000 (0.0000)
Insurance	Old Mutual	0.1390 (0.0000)	0.0022 (0.0000)	0.8580 (0.0000)	0.0169 (0.0000)	0.9700 (0.0000)	0.0024 (0.0000)	0.1790 (0.0000)	0.1360 (0.0000)	25.7000 (0.0000)
Insurance	Friends Provident	0.0319 (0.0000)	0.0170 (0.0000)	0.9580 (0.0000)	0.0203 (0.0000)	-0.4860 (0.0000)	0.0625 (0.0000)	0.4810 (0.0000)	0.4130 (0.0000)	3.2900 (0.0000)
Insurance	Standard Life	0.1200 (0.0000)	0.0069 (0.0000)	0.8730 (0.0000)	0.0331 (0.0000)	0.9960 (0.0000)	0.0132 (0.0000)	0.3200 (0.0000)	0.1980 (0.0000)	12.2000 (0.0000)

cont

Sector	Stock	ω	α	β	b	c	δ	ν	γ	λ
Media	Sky Broadcasting	0.0960 (0.0000)	0.3260 (0.0000)	0.6310 (0.0000)	0.1370 (0.0000)	0.5540 (0.0000)	0.6330 (0.0000)	0.2970 (0.0000)	0.2620 (0.0000)	7.1300 (0.0000)
Media	Reuters Group	0.0646 (0.0000)	0.0005 (0.0000)	0.9350 (0.0000)	0.0174 (0.0000)	0.7880 (0.0000)	0.0009 (0.0000)	0.2050 (0.0000)	0.1200 (0.0000)	37.2000 (0.0000)
Media	Yell Group	0.0812 (0.0000)	0.3210 (0.0000)	0.6500 (0.0000)	0.0349 (0.0000)	0.1410 (0.0000)	0.6930 (0.0000)	0.2430 (0.0000)	0.3080 (0.0000)	5.0300 (0.0000)
Oil & Gas	Royal Dutch Shell A	0.0399 (0.0000)	0.0632 (0.0000)	0.9070 (0.0000)	0.0350 (0.0000)	0.1590 (0.0000)	0.1280 (0.0000)	0.2160 (0.0000)	0.1210 (0.0000)	32.6000 (0.0000)
Oil & Gas	Royal Dutch Shell B	0.0852 (0.0000)	0.0710 (0.0000)	0.8560 (0.0000)	0.0843 (0.0000)	0.1910 (0.0000)	0.1720 (0.0000)	0.2900 (0.0000)	0.1260 (0.0000)	38.7000 (0.0000)
Personal & Household Goods	Imperial Tobacco Group	0.0398 (0.0000)	0.9600 (0.0000)	0.0015 (0.7300)	0.0001 (0.9050)	-0.4990 (0.0000)	0.0106 (0.0000)	0.0009 (0.0000)	0.1100 (0.0000)	42.0000 (0.0000)
Retail	Morrison	0.0824 (0.0000)	0.0002 (0.0000)	0.9170 (0.0000)	0.0051 (0.0000)	0.8740 (0.0000)	0.0005 (0.0000)	0.2490 (0.0000)	0.2120 (0.0000)	12.2000 (0.0000)
Retail	Alliance Boots Company	0.0469 (0.0000)	0.0084 (0.0000)	0.9440 (0.0000)	0.0961 (0.0000)	1.0000 (0.0000)	0.0521 (0.0000)	0.5150 (0.0000)	0.1040 (0.0000)	56.7000 (0.0000)
Retail	Home Retail Group	0.0439 (0.0000)	0.0009 (0.0000)	0.9550 (0.0000)	0.0330 (0.0000)	0.5330 (0.0000)	0.0037 (0.0000)	0.3940 (0.0000)	0.2750 (0.0000)	6.3700 (0.0000)
Technology	Sage Group	0.0699 (0.0000)	0.2680 (0.0000)	0.6970 (0.0000)	0.1770 (0.0000)	0.6610 (0.0000)	0.6530 (0.0000)	0.2630 (0.0000)	0.2300 (0.0000)	9.3800 (0.0000)
Travel & Leisure	British Airways	0.0000 (0.9650)	0.1670 (0.0000)	0.7820 (0.0000)	0.0001 (0.9970)	1.0000 (0.0000)	2.0100 (0.0000)	0.6980 (0.0000)	0.3000 (0.0000)	6.5800 (0.0000)
Travel & Leisure	Carnival	0.0510 (0.0000)	0.2930 (0.0000)	0.6570 (0.0000)	0.0001 (0.0000)	-0.4440 (0.0000)	0.0057 (0.0000)	0.0018 (0.0000)	0.1240 (0.0000)	33.5000 (0.0000)
Travel & Leisure	Whitbread	0.1240 (0.0000)	0.0378 (0.0000)	0.8460 (0.0000)	0.0827 (0.0000)	0.9770 (0.0000)	0.1070 (0.0000)	0.2180 (0.0000)	0.1820 (0.0000)	13.1000 (0.0000)
Utilities	International Power	0.0767 (0.0000)	0.0002 (0.0000)	0.9230 (0.0000)	0.1530 (0.0000)	1.0000 (0.0000)	0.0011 (0.0000)	0.3720 (0.0000)	0.1410 (0.0000)	26.4000 (0.0000)

Table 6: Diagnostics check of ACD residuals

Stock	Mean	LB(20)	P.val(LB(20))	D-Test	P.val(D-Test)	max(ACF)	min(ACF)
Alliance & Leicester	0.9710	22.1000	0.3330	1.5200	0.0640	0.0292	-0.0229
Antofagasta	0.9370	31.2000	0.0532	0.6620	0.2540	0.0290	-0.0172
DSG International	0.9630	57.4000	0.0000	1.1100	0.1340	0.0369	-0.0152
BHP Billiton	1.0200	248.0000	0.0000	6.1400	0.0000	0.0432	0.0031
Invesco	0.9460	86.3000	0.0000	1.1500	0.1250	0.0574	-0.0114
British Airways	1.0200	118.0000	0.0000	0.8420	0.2000	0.0358	-0.0243
British Land Co	0.9620	20.2000	0.4430	1.5600	0.0594	0.0249	-0.0172
Sky Broadcasting	0.9740	40.0000	0.0051	0.6550	0.2560	0.0397	-0.0156
Northern Rock	0.9410	53.9000	0.0001	1.3500	0.0884	0.0341	-0.0253
Cable & Wireless	0.9760	47.2000	0.0006	1.2400	0.1070	0.0388	-0.0277
Capita GRP	0.9160	51.4000	0.0001	0.8200	0.2060	0.0430	-0.0186
Aviva	0.9830	106.0000	0.0000	1.5300	0.0629	0.0326	-0.0177
Bradford & Bingley	0.9640	56.4000	0.0000	1.0400	0.1490	0.0333	-0.0253
Reuters Group	0.9550	76.7000	0.0000	1.0800	0.1410	0.0330	-0.0068
Diageo	0.9570	29.9000	0.0721	1.8700	0.0310	0.0337	-0.0136
BAE Systems	0.9650	113.0000	0.0000	0.8910	0.1870	0.0400	-0.0046
British American Tobacco	0.9910	75.1000	0.0000	0.9860	0.1620	0.0434	-0.0243
Gallaher GRP	0.9760	55.8000	0.0000	0.1100	0.4560	0.0533	-0.0159
Hammerson	0.9260	34.3000	0.0240	1.7700	0.0383	0.0334	-0.0108
Standard Chartered	0.9850	101.0000	0.0000	1.6000	0.0552	0.0498	-0.0031
Rexam	0.9790	38.0000	0.0089	1.1300	0.1300	0.0409	-0.0280
Resolution	0.9760	91.4000	0.0000	0.6940	0.2440	0.0391	-0.0239
Imperial Tobacco Group	0.9480	52.1000	0.0001	1.3100	0.0947	0.0380	-0.0118
Imperial Chemical Ind.	0.9520	30.2000	0.0671	0.9950	0.1600	0.0332	-0.0106
Johnson Matthey	0.9680	21.3000	0.3770	1.7000	0.0449	0.0253	-0.0210
SABMiller	0.9450	64.3000	0.0000	1.2800	0.0995	0.0507	-0.0157
Anglo American PLC	1.0300	317.0000	0.0000	1.0900	0.1380	0.0491	-0.0023
Compass Group	0.9670	27.5000	0.1210	1.6900	0.0454	0.0312	-0.0195
HSBC Hlds	0.9980	154.0000	0.0000	5.2400	0.0000	0.0458	-0.0069
Legal & General Group	0.9560	60.7000	0.0000	1.4100	0.0789	0.0470	-0.0151
Morrison	0.9620	43.3000	0.0019	1.6400	0.0508	0.0228	-0.0281
Cadbury Schweppes	0.9770	385.0000	0.0000	0.6990	0.2420	0.1020	-0.0080
International Power	0.9590	86.5000	0.0000	0.6740	0.2500	0.0397	-0.0110
United Utilities	0.9710	53.9000	0.0001	1.8700	0.0311	0.0378	-0.0143
Royal & Sun Insurance	0.9630	52.9000	0.0001	1.1800	0.1190	0.0406	-0.0196
Associated British Foods	0.9720	34.7000	0.0215	0.8200	0.2060	0.0398	-0.0253
Pearson	0.9600	27.6000	0.1200	0.8670	0.1930	0.0373	-0.0176
Persimmon	0.9420	73.6000	0.0000	2.5600	0.0052	0.0592	-0.0263
Liberty International	0.9300	56.8000	0.0000	0.5520	0.2900	0.0456	-0.0321
Prudential	0.9680	97.4000	0.0000	1.7200	0.0428	0.0483	-0.0167
Rio Tinto	1.0200	160.0000	0.0000	1.0900	0.1370	0.0317	-0.0017
Reckitt Benckiser	0.9660	118.0000	0.0000	0.0607	0.4760	0.0622	-0.0110
Reed Elsevier	0.9350	62.2000	0.0000	0.8960	0.1850	0.0376	-0.0188
Old Mutual	0.9450	81.7000	0.0000	0.8530	0.1970	0.0405	-0.0149
Royal Bank Of Scotland	1.0100	171.0000	0.0000	3.1600	0.0008	0.0457	-0.0047
Scottish & Newcastle	0.9210	121.0000	0.0000	0.0647	0.4740	0.0496	-0.0182
Scottish & Southern Energy	0.9400	56.8000	0.0000	2.3300	0.0099	0.0345	-0.0172
BP	1.0100	189.0000	0.0000	2.9100	0.0018	0.0321	-0.0104
Sage Group	0.9680	32.8000	0.0356	0.3140	0.3770	0.0394	-0.0145
Slough Estates Reit	0.9750	34.3000	0.0243	0.7510	0.2260	0.0348	-0.0270
Smiths Group PLC	0.9490	83.0000	0.0000	2.4700	0.0067	0.0702	-0.0215
Lloyds TSB Group	0.9840	49.7000	0.0002	2.9100	0.0018	0.0290	-0.0142
Tate & Lyle	0.9330	35.5000	0.0176	2.2000	0.0138	0.0304	-0.0138
BG Group	0.9650	67.4000	0.0000	1.1800	0.1200	0.0391	-0.0097
Tesco	0.9660	90.8000	0.0000	4.2000	0.0000	0.0415	-0.0128
Smith & Nephew	0.9470	43.8000	0.0016	1.0800	0.1390	0.0372	-0.0147

cont

Stock	Mean	LB(20)	P.val(LB(20))	D-Test	P.val(D-Test)	max(ACF)	min(ACF)
GlaxoSmithKline	0.9840	44.1000	0.0014	1.9100	0.0284	0.0273	-0.0151
Wolseley	0.9560	60.0000	0.0000	0.7560	0.2250	0.0323	-0.0202
Kelda Group	0.9320	56.3000	0.0000	1.0800	0.1390	0.0627	-0.0171
AstraZeneca	0.9990	150.0000	0.0000	2.0600	0.0196	0.0377	-0.0042
Friends Provident	0.9820	30.4000	0.0636	1.2500	0.1050	0.0335	-0.0217
HBOS	0.9730	49.0000	0.0003	6.7000	0.0000	0.0363	-0.0092
BT Group	0.9700	69.4000	0.0000	2.2600	0.0120	0.0302	-0.0196
Lonmin	0.9510	48.8000	0.0003	0.8620	0.1940	0.0407	-0.0207
Carnival	0.9590	98.5000	0.0000	0.9940	0.1600	0.0562	-0.0099
Marks & Spencer Group	0.9590	19.9000	0.4610	1.7600	0.0391	0.0336	-0.0156
Barclays	0.9980	218.0000	0.0000	3.8600	0.0001	0.0641	-0.0062
Xstrata	1.0300	215.0000	0.0000	2.0500	0.0203	0.0421	-0.0046
Yell Group	0.9680	29.1000	0.0866	1.2700	0.1030	0.0305	-0.0197
Land Securities Group	0.9660	38.9000	0.0069	1.8500	0.0324	0.0272	-0.0155
Next	0.9610	60.1000	0.0000	1.2200	0.1110	0.0432	-0.0138
Cairn Energy	0.9570	17.7000	0.6060	1.6700	0.0473	0.0341	-0.0180
Rolls-Royce Group	0.9510	21.6000	0.3620	1.8200	0.0340	0.0267	-0.0163
Kingfisher	0.8550	210.0000	0.0000	1.6300	0.0517	0.0514	0.0027
Vedanta Resources	0.9500	26.2000	0.1600	0.7090	0.2390	0.0426	-0.0129
Hanson Company	0.9450	42.5000	0.0024	1.6900	0.0454	0.0458	-0.0147
ICAP	0.9450	44.4000	0.0013	1.3100	0.0947	0.0305	-0.0305
ITV	0.9840	30.5000	0.0628	1.0100	0.1570	0.0364	-0.0219
Sainsbury (J)	0.9770	108.0000	0.0000	1.5800	0.0575	0.0494	-0.0014
Centrica	0.9540	82.8000	0.0000	1.9800	0.0238	0.0522	-0.0091
Royal Dutch Shell A	0.9510	96.3000	0.0000	1.0500	0.1470	0.0407	-0.0143
Royal Dutch Shell B	0.9830	85.5000	0.0000	1.1900	0.1170	0.0414	-0.0144
National Grid	0.9590	40.7000	0.0041	2.2600	0.0118	0.0272	-0.0196
Kazakhmys	0.9350	29.5000	0.0787	0.5390	0.2950	0.0507	-0.0103
WPP Group	0.9550	67.1000	0.0000	0.8870	0.1870	0.0338	-0.0089
Shire	0.9560	80.7000	0.0000	1.2000	0.1150	0.0509	-0.0153
Alliance Boots Company	0.9730	95.3000	0.0000	0.6160	0.2690	0.0417	-0.0045
Unilever	0.9670	136.0000	0.0000	1.5300	0.0628	0.0366	-0.0104
Scottish Power	0.9820	69.7000	0.0000	0.6840	0.2470	0.0340	-0.0260
Intercont Hotel GRP	0.9520	21.9000	0.3440	1.0300	0.1520	0.0404	-0.0255
Man Group	0.9710	111.0000	0.0000	1.8700	0.0308	0.0464	-0.0094
Vodafone Group	0.9760	105.0000	0.0000	2.1600	0.0156	0.0270	-0.0028
Standard Life	0.9730	71.5000	0.0000	0.0531	0.4790	0.0538	-0.0323
3I GROUP PLC	0.9360	65.4000	0.0000	1.4200	0.0785	0.0488	-0.0124
Home Retail Group	0.9670	21.6000	0.3600	0.9170	0.1800	0.0362	-0.0239
Experian Group	0.9820	27.0000	0.1350	0.7930	0.2140	0.0351	-0.0213
DRAX GRP	0.9550	22.7000	0.3060	0.6870	0.2460	0.0289	-0.0189
Severn Trent	0.9620	59.9000	0.0000	0.3420	0.3660	0.0482	-0.0185
Whitbread	0.9350	45.9000	0.0008	0.7160	0.2370	0.0334	-0.0254
Enterprise Inns	0.9870	23.8000	0.2530	1.3100	0.0943	0.0454	-0.0131