

Firstly, I would like to express my deepest thanks to the reviewer for taking the time to read and comment on my paper.

In relation to your comment, in which you stated that we introduced the definition of directional-change in our previous papers. I would like to highlight that this is the first paper that defines, in detail, the definition of the directional-change event approach for studying the financial time series. In actual fact, this paper illustrates, to the reader, the core mechanism of the directional-change event approach. In comparison, the previous papers briefly introduced the directional-change events approach; please can you refer to these papers. However, the main message of this paper, besides defining in details the directional-change event approach, is to show the usefulness of this approach for the study of the financial time series.

I would also like to respond to your comments regarding the lack of references mentioned in the paper, only one of which is not the author of the manuscript. This is due to the exceptionally few numbers of studies established for studying price time series beyond the notion of physical time changes, despite this being a problem for the last 40 years.

In section 2, you state that the explanation of the directional-change event approach is quite obscure to the reader. I would be grateful if you would be able to clarify which parts of section 2 you believe to be obscure to the readers? We attempted to make this paper very clear and easy to follow to the reader as it explains a very important approach, in our view, for the study of the financial time series.

In relation to your comments regarding the novelty of the presented results, in which you observe that the analysis of the length of the "price curve coastline" has already been presented in Glattfelder *et al.* (2011). Yes, such an analysis has already been presented in Glattfelder *et al.* (2011). However, in this paper we follow a different methodology in order to measure the length of the price curve coastline. The aim of this measurement is to compare the length of the price curve coastline measured under both intrinsic and physical time. In detail, the measurement in our paper is based on a fixed number of points in order to obtain a fair comparison, please refer to the paper for more information. This methodology was not presented by the Glattfelder *et al.* (2011) paper. In addition to this, in this section we also measured the total error of the length of the price curve coastlines under both intrinsic and physical time. Once again, this was not presented or mentioned in the Glattfelder *et al.* (2011) paper.

You also mentioned that the point on the usefulness of the event-based time had already been declared in a previous paper, by the same author. However, this is not true. This is the first piece of work that defines, in detail, the directional-change events approach and, most importantly, documents its usefulness for the study of the financial time series. Please refer to the references mentioned in the paper which present our previous work, with regards to the directional-change events approach.

Finally, your main criticism was concerning the relevance of the presented results, in which you pointed out that you were unclear as to what was the main economic message of the results. This paper highlighted the importance of studying the price time series, based on intrinsic time, which adopts an event-based system, rather than the physical time changes, which adopts a point-based system. Physical time is homogenous, which means equally spaced time scales in any chosen time scale. In contrast, intrinsic time is inhomogeneous as

time triggers only at periodic events, independent of the notion of physical time. Therefore, using physical time to detect periodic patterns in a time series, maps a variety of patterns with different magnitudes. This is due to the fact that the level of trading activity depends on the time of day. Therefore, the flow of market trading activity discontinues. In contrast, intrinsic time enables the analyst to capture stable patterns and, in addition to this, reduces the level of complexity of real-world time series.

Again, thank you so much for your efforts and time!