

# Do Real Estate Cycles Exist and, if so, Are They Predictable?

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**Abstract** A straightforward answer to the question comes from Lee’s paper entitled “Real Estate Cycles: They Exist... and Are Predictable” (2011). However, this essay intends to be critical, thus it investigates the various schools of thought on property cycles aiming at determining if they exist and, in the case of positive evidence, if they are predictable. The paper is divided into five sections: the introduction, a general definition of cycles, an analysis of the two opposite academic views on cycle existence, an overview on real estate forecasts, including techniques, evaluation of methods and challenges, and a final section where the findings are summarized and a conclusion is drawn.

**Keywords** Real estate · Property cycles · Forecast · Predictability · Consensus

## 1 Introduction

The existence of property cycles is largely assumed as a postulate in much of the research publications. This paper questions this assumption by reviewing a number of academic studies that adopted different approaches to this issue and took opposing viewpoints. In order to comprehend the body of knowledge presented here, it is first fundamental to define property cycles and their characteristics. In addition, it is necessary to identify their linkages with the real economy and the money economy, since both the business cycle and the credit cycle influence the property cycle. The paper then discusses the various arguments that support either the existence or the non-existence of property cycles in order to pursue the first aim of the paper, which is to verify if the property cycle theory is validated or rejected. Once the evidence leads to the recognition of the succession of diverse cycles throughout the history of the property market observed, the paper investigates the

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regularity of cycles. Indeed, the second aim of the paper is to understand whether cycles are predictable or not. The academic community is split into two opposing positions: those who elaborate complex techniques to forecast cycles and those fully convinced that to predict them in a reliable and consistent way is not possible. Nonetheless, the literature reviewed presents some indicators and indexes that anticipate economic turns enabling for short-term predictions. However, it is acknowledged that cycle forecasts are difficult, to say the least, due to the complexity of mathematical models, data availability, and, most of all, investors' behavior and experts' reliability. This is illustrated by both the unpredictability of investors' reactions to market fluctuations and the role of consensus and smoothing in forecasting. In particular, it is shown that these aspects increase the uncertainty of forecast formulation. In order to obtain more accurate forecasts that take into account these critical factors, it is finally suggested to elaborate prediction models that integrate both behavioral and mathematical variables.

## 2 Property Cycle Definition

Property cycles are “international and global forces” constituted by “a logical sequence of recurrent events reflected in factors such as fluctuating prices, vacancies, rentals and demand in the property market” (RICS 2014). In particular, the physical cycles of supply and demand drive rents and affect financial cycles that in turn influence property prices through the capital flows to real estates (Mueller 1995).

Pyhrr et al. (1999) define real estate cycles as the interaction between the physical cycles of supply and demand. Physical cycles are local since the demand for space depends on the space needed for residential and business purposes, and the supply of space is determined by actual space, space under construction, and prospective need for space. The relation between supply and demand is defined through the definition of the occupancy/vacancy rate, which is a fundamental factor in affecting rents (Muller 2005). Typically, the rent cycle matches inversely to the vacancy cycle and is lagged by  $\frac{1}{4}$  of the cycle periodicity, as shown in Fig. 1 (Wheaton 1987).

In Fig. 2, the intersections of the two curves represent the points of the equilibrium between supply and demand.

The general property curve is obtained by connecting these points, so that Bs constitute the peaks and As constitute the troughs (Jing 2010), as reported in Fig. 3. Mueller and Laposa (1994) identify four phases in the cycle: recession, recovery, expansion, and contraction. Investors indicate recovery and expansion as the up-cycle or the cycle upside, because the occupancy rate increases in these phases, whereas they label contraction and recession the down-cycle or the cycle downside, due to the fall of the occupancy rate. The equilibrium-rate line intercepts the curve at the inflection points where the curve changes its concavity and it marks the different positions and directions of the cycle (Pyhrr et al. 1999).

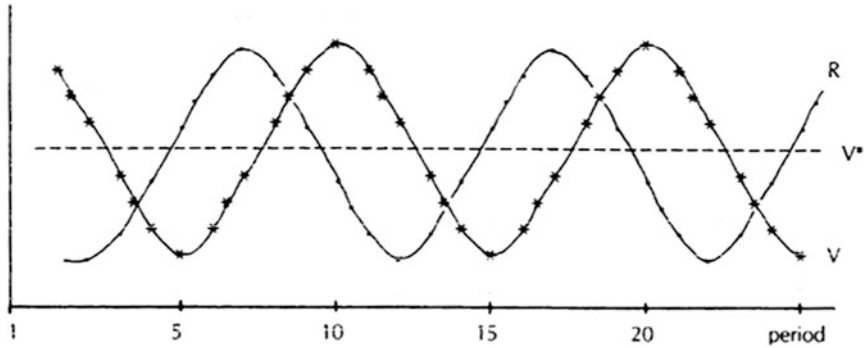


Fig. 1 Vacancy and rent cycles (Wheaton 1987)

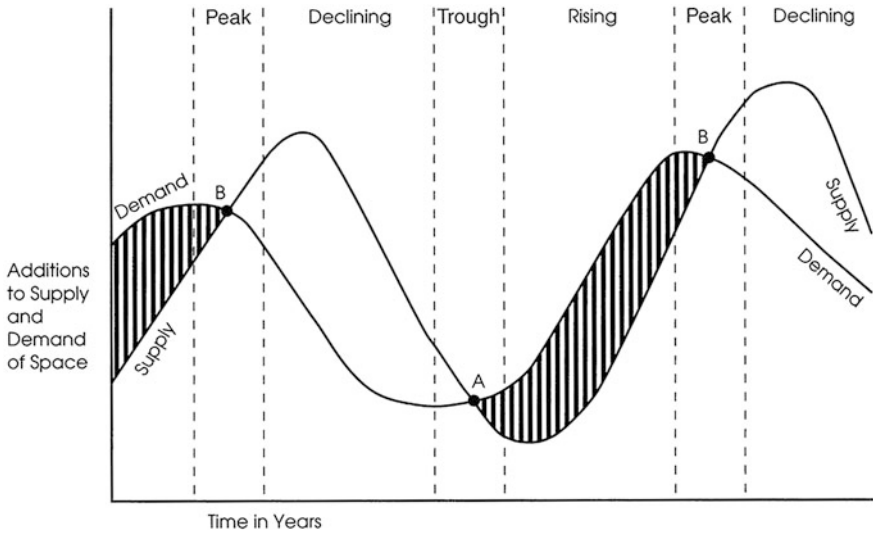


Fig. 2 Supply and demand cycles (Pyhrr et al. 1990)

However, the periodicity of the cycle is not always the same and Barras (1994) listed four types of property cycles identified by the literature: short cycles lasting for four to five years, long cycles lasting for nine to ten years, long swings lasting up to 20 years, and long waves of 50 years.

The conceptual model elaborated by Barras (1994) and reported in Fig. 4 shows how the property cycle is influenced by the business cycle in the real economy and by the credit cycle in the money economy. Indeed, real estate prices, and consequently total property returns, are mainly determined by capital flows. In particular, as capitals flow in prices increase (Muller 2005). In addition, interest rates have an impact on prices as well (Mueller 1999). Mueller (1995) refers to these movements as financial cycles. The distinction between physical and financial cycles is useful to

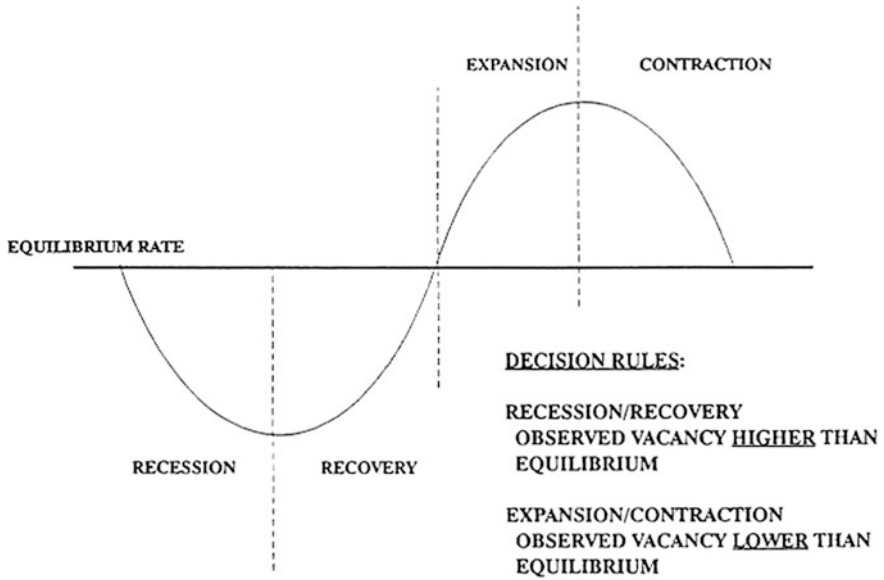


Fig. 3 General property curve (Mueller and Laposa 1994)

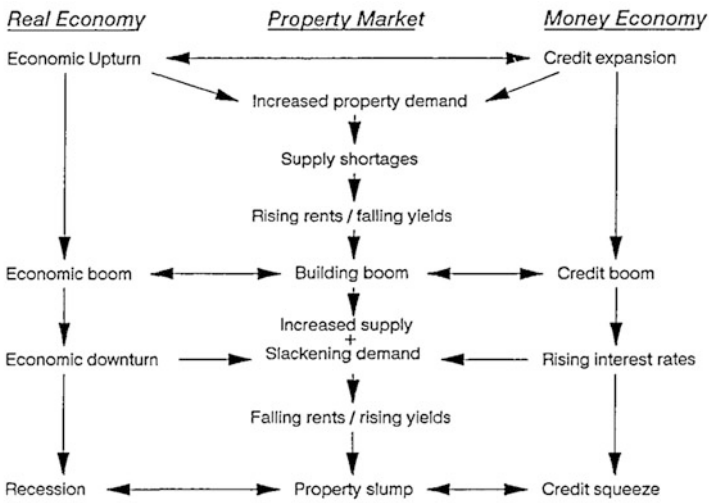


Fig. 4 Interactions among cycles (Barras 1994)

understand the lag between market movements and real estate prices (Mueller and Pevnev 1997).

When discussing cycles, real estate academics and practitioners identify three markets in which they occur: use, investment, and development. In this way, they distinguish the rental cycles, the yield cycles, and the construction cycles (Tiwari and White 2014). In this context, another useful definition considers cycles as the “tendency for property demand, supply, prices and returns to fluctuate around their long term trends or averages” (Baum 2000).

### 3 The Two Academic Positions

Even though numerous studies have been conducted on property cycles, there is considerable controversy about their existence in the academic world. It is possible to divide researchers into two opposing groups: one that is deeply convinced that cycles exist and that, by putting a sufficient effort, they can be predicted; and one that compares the reliability of forecasts to astrologers’ reliability (Fama 1965) and the predictability of future trends to the predictability of the results of a fair roulette wheel or of the toss of a coin (Cootner 1962).

In the last group can be placed the studies conducted by socialist economists and reviewed by Allsopp (1971) that rejected the idea of natural periodicity of property cycles. Indeed, Nove (1967) sees the cause of cyclical effects in political and natural shocks, while Brody (1967) and Goldmann (1969) see the cause in planning processes and political pressure to over-invest.

Fama and Blume (1966) stated that price “changes are independent random variables” and thus supported the theory of random walks elaborated by Bachelier (1900) according to which future trends cannot be predicted on the basis of past series because fluctuations depend on innumerable factors including both earlier trends and actual market position. This model has been tested by numerous researchers through various different techniques. One of the most notable examples is Kendall’s work (1953), which analyzed 22 price-series and experimentally proved that both serial correlation within series and lag correlation between series were low, which implies that forecasts cannot be inferred.

Nevertheless, Alexander (1961) re-examined Kendall’s series and found confirmation of the theory of random walk over the time dimension, but not in the move dimension. Indeed, he verified that a move, once started, tends to persist. In addition, Hautthakker (1961) specify that randomness can only be disproved but not proved as tests can only detect the absence of specific researched patterns, but cannot exclude the presence of unknown ones.

Concerning the view that sustains cycle existence, Harris (2000) explained that cycles would not exist if a perpetual equilibrium between demand and supply could be maintained. However, the lag between the demand emergence and the supply availability determines the cycle’s existence (Harris 2000).

Baum (2000) had no doubt in asserting that property cycles can be demonstrated both in UK and European real estate markets. Zarnowitz (1992) points out that after every crisis new theories on property cycles emerge in an attempt to explain the causes. The last one does not constitute an exception, so Jadevicius et al. (2010) stated that the existence of cycles both in the general economy and in the property sector is quite evident after the housing market crash of 2008 and the subsequent global economic crisis. Actually, it is possible to recognize cycles since the dawn of time. Sheppard et al. (1979) traced the building activity in London over the two-century period between 1714 and 1900, and they produced strong evidence for the existence of the classical pattern of property cycles characterized by the alternation of booms and busts, as illustrated in Fig. 5.

Later, McGregor and Schwann (1999) proved the presence of cycles and co-cycles in property markets in various British regions by analyzing the data from 39 of them. Simultaneously, Wilson and Okunev (1999) recognized the existence of property cycles thanks to the analysis of the assets through conventional spectral-analysis techniques. More recently, Brown and Liow (2001) investigated the office market and the property stock prices in Singapore through cross-spectral analysis and univariate spectral analysis and demonstrated the presence of an eight-year cycle in both markets. Wang (2003) applied the econometric procedures of cointegration and common trend to the analysis of data of the property and non-property sectors and highlighted the presence of cyclical patterns both in the property sector and in its relation to the other economic sectors.

Even though both positions presented have quite strong arguments to prove their validity, evidence leads to an assertion that property cycles exist. It has to be said that it might be easier to prove their existence rather than not, as their non-existence can only be disproved and not proved. Nonetheless, since a significant number of studies have demonstrated their presence through the application of different

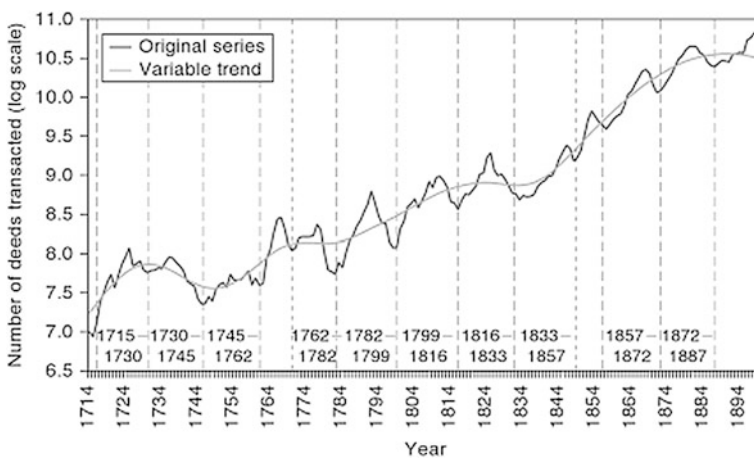


Fig. 5 London real estate market trends (Sheppard et al. 1979)

methods to various data, their existence has to be recognized. The following section will debate whether they are predictable or not, what are the methods adopted to forecast them, how forecasts are evaluated, and what are the limitations associated with forecasts.

## 4 Cycle Forecast

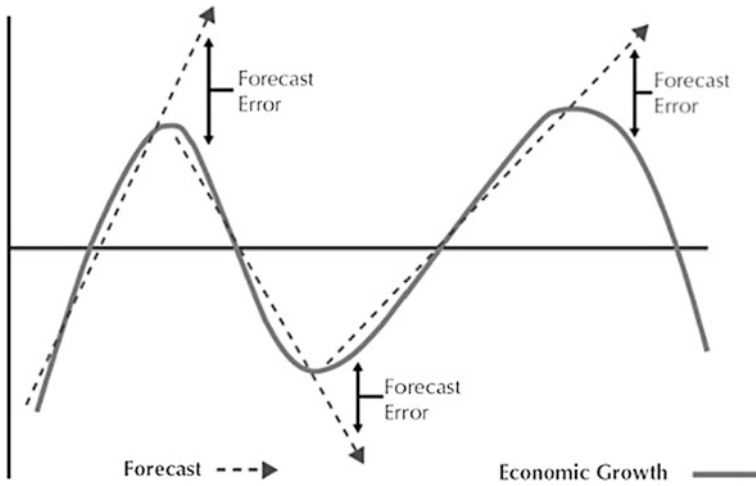
Forecasting the physical cycles is not very complicated, thanks to the abundance of data on both supply and demand. On the contrary, predicting the financial cycles is much more complicated because data on the property capital market is quite scarce, and the whims of investors have never been documented (Mueller 2005). Barras (1994) confirmed that research is able to forecast future demand, but cannot predict the competitors' reactions to this information. The physicist Isaac Newton, after a loss in the stock market, confessed that he could "*calculate the motions of heavenly bodies, but not the madness of people*" (O'Farrell 2007).

Barras (1994) highlighted that real estate booms tend to "*occur in every second long cycle of development and in every fourth short cycle of business activity*". Nevertheless, he also stated that this is just a tendency and specific economic and political conditions might alter it. Solomou (1998) illustrated that a long-run historical perspective is necessary in order to be able to sensibly predict future trends. However, he clarified that the usefulness of historical knowledge has not to be valued as an inescapable precedent, but rather in the explanation of the evolution of business cycles that make it possible to understand the mechanisms that determine the change and so lead to sensible forecasts.

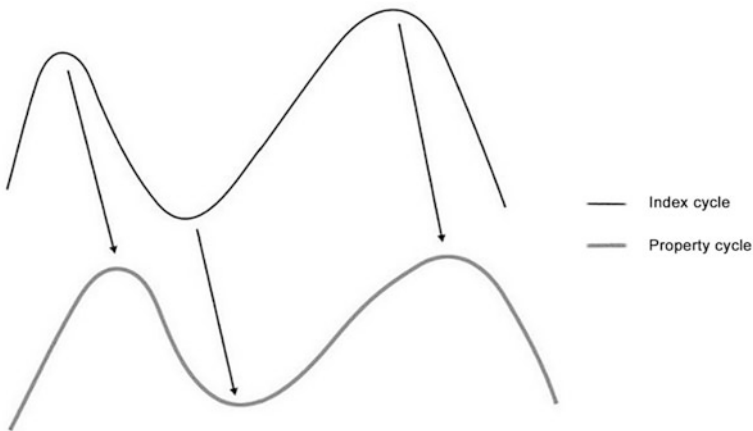
Starting from this point, Achuthan and Banerji (2004) detailed that the difficult task is to predict turning points, because they do not occur in regular intervals, and the simplistic projection of past cycles into the future leads to blunders as shown in Fig. 6. Tonelli et al. (2004) argued that, even though several econometric models have been elaborated to forecast cycles, to predict them in a reliable and consistent way is not possible yet.

Despite this, Wheaton et al. (1997) noticed a relationship between cycles and economic shocks. Coherently with this study, Achuthan and Banerji (2004) identified more than one hundred cyclical indexes that precede economic turns, so that it is possible to elaborate correct near-term predictions. Figure 7 shows how property cycles follow indicators cycles. Among these indicators, Festa et al. (2012) identified prices and the number of transactions.

Various quantitative models have been elaborated to forecast property cycles. In their book, Brooks and Tsolacos (2010) book provide a thorough explanation on many of them. Reid (1968) and Bates and Granger (1969) developed the first models that combine single forecasts techniques in order to achieve results that are more accurate. Since these studies, a lot of research has been conducted on this subject, and Clemen (1990) catalogued all the contributions, reaching the conclusion that a combination of forecasts ensure higher accuracy. Jadevicius et al. (2012)



**Fig. 6** Forecast errors (Achuthan and Banerji 2004)



**Fig. 7** Indicator cycles and property cycles (Achuthan and Banerji 2004)

tested the performance of a large number of single-forecast techniques and subsequently used simple averaging and regression to combine them in couples and verified that the accuracy is higher in model combinations than in single models.

Foldvary (1997) forecasted the recession of 2008 thanks to a prediction model that integrated the Austrian theory and the geo-economic theory of cycles. In 2007, he noticed that recessions and depressions start two years after the peak, and, since he identified the previous peak in 2006, he confirmed his prediction for 2008 adding that he expected a severe recession and depression due to the high rise of property prices and to the economic distortions caused by the growth of the money supply.



It is clear that mathematical approaches have enormously improved (De Gooijer and Hyndmanb 2006), but Barras (2009) admonished researchers for being too focused on theories rather than on reality, so that they tend to represent the reality they think should exist instead of the one they can observe. However, reality observation is quite difficult due to data availability and expert reliability (Dayananda et al. 2002). In addition, the forecasting process is further complicated by various influences that affect them. For example, Gallimore and McAllister (2004) highlighted the role of human judgment that leads forecasters to censor themselves in the name of reputation protection, forecast credibility, and acceptance among clients. The latter leads to forecast inefficiency, according to Nordhaus (1987). He suggested that efficiency probably exists in the original forecasts, but vanishes in the published ones due to the need to slowly prepare the public for the new reality in order to maintain the previously reached consensus.

Performances of forecasting methods have been evaluated over time through various accuracy measures (De Gooijer and Hyndmanb 2006). Among others, McAllister et al. (2008) measured the accuracy and disagreement among forecasts. They analyzed and compared the performances of various property and non-property forecasting organizations and they evidenced forecast consensus and smoothing. More specifically, their study suggests that forecasters tend to produce projections similar to each other and to limit the differences among them. In addition, forecasters restrain volatility by underestimating total returns in improving performances and overestimating them in deteriorating performances. The causes of homogenization in results are not clear and are supposed to lie in herding behavior among forecasters and in the use of non-property forecasts as inputs. Volatility limitation is ascribed by Nordhaus (1987) to the willingness to avoid big “jumps”, and Gallimore and McAllister (2004) elaborated this explanation by attributing it to scepticism about big numbers.

Actually, informal conversations held with professionals working in real estate consultancies revealed that, by the time they write formal reports on future trends, they have already had contacts and exchanges of views with their colleagues in other firms. Consequently, it appears completely normal to them to publish forecasts that do not differ much from each other. However, this is not due to the willingness to present to the public a unique vision, but rather it is determined by group reasoning and discussion that smooth over the differences and lead to similar conclusions. According to them, a certain level of smoothing, consensus, and homogenization is unavoidable when data are analyzed in groups, since participants influence each other.

## 5 Conclusions

This paper is based on thorough research conducted on property cycles and presents a wide literature review, which identified different argumentations on both the existence and predictability of property cycles, aiming at validating or rejecting the

property cycle theory and at determining if property cycles are predictable or not. It is divided into five sections: the introduction; a general definition of cycles; an analysis of the two opposite academic views on cycle existence; an overview on real estate forecasts; and this conclusion.

The introduction explains the starting point of the research, the aims of the paper, and both its content and structure.

The second section provides a definition and description of the cycles. It illustrates the four phases of the cycle and explains that the phases of recovery and expansion are also labelled the up-cycle because of the increase of the occupancy rate, whereas the contraction and recession phases are also called the down-cycle because of the fall of the occupancy rate. It also emphasizes that property cycles are not fixed cycles that simply repeat themselves over time. On the contrary, they are variable cycles influenced by economic and monetary cycles. In this regard, four main kinds of cycles are identified: short cycles lasting for four to five years, long cycles lasting for nine to ten years, long swings lasting up to 20 years, and long waves of 50 years.

The third section illustrates the two opposing positions regarding the existence of property cycles. On the one hand, there are the researchers who produced numerous studies that illustrate the presence of cyclical patterns in the real estate market. On the other hand, there are the scholars who assert the complete randomness of price fluctuations. Since the inexistence of cycles can clearly only be disproved and not proved, it might appear banal to share the first perspective, but the literature reviewed provides strong evidence in support of property-cycle existence by reporting numerous studies on various data analyzed through various techniques and methods.

The fourth section is the most complicated because it deals with numerous questions concerning the predictability of cycles. The main findings are the application of a historic perspective to identify signals for turning points and the formulation of constantly improved integrated techniques to predict cycles. In particular, more than one hundred cyclical indexes have been identified to elaborate near-term predictions, and it is seen that the combination of various single models ensure higher accuracy in forecast evaluation. However, two critical points are highlighted in this task: consensus and smoothing. It is reported that real estate professionals tend to influence each other and to censor themselves, causing inefficiency.

To conclude, it can be argued that property cycles exist and are predictable. However, even though very efficient mathematical methods have been elaborated for their prediction, forecast reliability might be compromised by the search for consensus, the fear of big changes and the consequent tendency to smooth over the results in order to obtain predictions closer to actual reality and easier to be accepted by clients. In addition, interaction among professionals from different firms influences data interpretation, so that they reach similar conclusions.

Consequently, it is recommended to develop new models that integrate mathematical and behavioral variables and to conduct further research to verify if they are able to provide more accurate forecasts.

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