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Common socio-economic cycle periods ☆

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ABSTRACT

We present a meta-analysis of cycle periods in historical socio-economic data found in the K-wave literature. The literature on stochastic and deterministic cycles in variables such as the consumer price index, employment, interest rates, commodity prices, GDP, war and hegemony is huge and scattered. However our meta-analysis reveals various commonalities. Our key finding is that there is a common set of cycle periods that is common across most socio-economic variables.

1. Introduction

The literature on cycles that are found in economic data is large and scattered. Most well-known cycles are those named after of Kitchin, Juglar, Kuznets and Kondratieff, but there are many more. Cycles can be deterministic or stochastic or both. Cycles have been documented for a wide variety of economic variables like the consumer price index, employment, interest rates, commodity prices, GDP and so on. Also, a range of methods for identifying these cycles has been used, from simple graphical analysis to advanced econometric tools like fractional integration models.

The literature does not provide any consensus on which method is the best to use, and neither will we do so. Also, there is no consensus on which variables are most interesting and important to consider. There is consensus, however, on the notion that economic variables experience cycles with certain reasonably constant cycle periods, and that many economic variables have more than one such cycle. In this paper we build on this important consensus, and we provide a meta-analysis of the documented cycles in most of the available literature.

In Section 2 we review documented cycles in economic variables, where our review is based on chronological developments in the relevant literature. In Section 3, we meta-analyze these cycles and we study their commonalities. Our key finding is that there clearly is a set of cycle periods that is common across economic variables. Section 4 concludes our study and suggests a topic for further research.

2. Cycles in economic variables, a chronology

It is remarkable to observe that in times of economic prosperity there is little attention for the potentially long swings in the economy whereas in times of economic despair the debate thrives. When Parvus (alias A. Helphand) [89] and Van Gelderen and J.

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(alias J. Fedder) [110] published their articles in the booming economy of the early 20th century they encountered little resonance. In fact, the long wave debate really started by [46] and flourished during the depression before the Second World War. [95] ensured the further distribution of the long wave principles. After the Second World War had finished and the economy got back on track researchers again lost interest in the long wave discussion until the depression of the seventies revived the debate. Interestingly, also the start of the 3rd millennium marked an increased research activity.

The long wave discussion regained momentum in the 1970s and 1980s after a stalemate in the 1950s and 1960s. Various theories have been developed during that first period. Mandel, as the most important Marxist author, confronted his ideas with the ideas of the Schumpeterians and Neo-Schumpeterians like Mensch, Kleinknecht, van Duijn, Freeman, Tylecote and Perez who have dominated these schools of thought. Furthermore Rostow, Forrester, Goldstein, Gordon and Boyer each made a contribution from other angles. As the discussion progressed, it could be noticed that differences between schools of thought became smaller and more hybrid theories integrating principles from all schools arose.

Also at the time of writing, a little after the change of the millennium, there is a revived focus on long and short run cycles in economic variables. Various authors propose new and innovative theories, and also the use of advanced econometric tools is fashionable. In this section we give a chronology of all important contributions in the literature on cycles in economic variables.

2.1. Prior to 1925, the pioneers of the long wave debate

The pioneers of the long wave debate are Clarke, Jevons, Juglar, Marx, Tugan Baranosky, Parvus and Van Gelderen.

Clarke [14] distinguished a 54-year cycle in crop and famine and Lord William Henry Beveridge [13], discovered in the 1920's and described a long cycle with a period of 54 years in agricultural price cycles, as it is written in Mager [56].

Juglar [40] discovered a cycles with a period varying between 7 and 11 years. This cycle is now commonly known as the "ordinary medium term business cycle". In his 1862 book "Des crises commerciales et de leur retour periodique en France, en Angleterre et aux Etats-Unis", Juglar writes that the fluctuation in the economy is not the consequence of forces from outside of the economy but from the inside, hereby indicating that there must be an endogenous explanation. Juglar discerned three stages in this cycle, that is, a period of progress, of crisis, and of liquidation. He did not formulate an explicit theory, but he did present historical and statistical data.

2.2. The long wave debate starts in 1925

Long waves or Kondratieff cycles concern surges in economic development that last for about half a century. In 1929 Rolf Wagenfuhr was the first to pay attention to Kondratieff's [46] findings. It was Schumpeter [95], see also Kuznets [51] who gave names to the various cycles ([47] Kitchin, Juglar and Kuznets) and took a lead in the debate although his approach differed. Schumpeter put theory before empirics while Kondratieff did this the other way round. Furthermore, Schumpeter applied Walras' general equilibrium theory while Kondratieff relied on Marshall's partial equilibrium theory.

The long wave debate seems to start with [48]. Kondratieff stated that the dynamics of economic life in the capitalist system is not linear but has a complex cyclical character. He concluded in his empirical research, in which he used data from England, France, Germany and the US, that long waves with an average period of 50 years exist in prices and other variables such as interest rates, wages, consumption, foreign trade and the production of coals, pig iron and lead. According to Kondratieff, these long waves were inherent to the capitalist system. He also stated that the timing of these long waves had just about synchronized internationally. From 1780 until the 1920's, Kondratieff recognized two and a half such a long wave cycle. The long wave was considered by Kondratieff to be an exogenous phenomenon. That is, he conjectured that changes in technology, wars and revolutions, the assimilation of new countries into the world economy and fluctuations in gold production were consequences of the wave, thus endogenous.

Kondratieff indicated that he formulated this theory in the period between 1919 and 1921 and published it in 1922. He writes he was unaware of Van Gelderen's work from 1913. In 1926 he was first informed about its existence when he read an article by the Dutch Marxist de Wolff who referred to Van Gelderen's article.

The Kitchin stock cycle was discovered in 1923. Kitchin [41] found a pattern of fluctuations that lasted for about 3 to 4 years. He explained these fluctuations by stating that after a recession, firms had too little stock of raw materials, parts, half fabricates and final products. While aiming to get their stock at an acceptable level, firms create a demand that influences the entire economy. Demand increases until the firms find out that their expansion has been too exuberant and their stock has become too large. In order to diminish the excess stock, firms will cut back on their stock orders and will lower their output. This in turn can drag the economy into a recession.

The Kitchin cycle is considered an endogenous cycle [108]. There has been relatively little criticism on this cycle in particular as there has always been much empirical support for this cycle. Tylecote conjectures that it is unlikely that the cycle still exists in its original form. Furthermore, Tylecote refers to the 4-year presidential cycle which matches well with the period of the original Kitchin cycle, which suggests that there are more possible reasons for finding 4-year cycles.

Kuznets [49,50]) investigated "secondary secular movements" in fifty-nine time series which encompassed both output and price components for particular commodities. He concluded that the secondary secular movements in prices are similar to those in production. The period of the cycle was, according to Kuznets, around 22 years for production and 23 years for prices. He furthermore argued that the term "cycle" was too strict and he preferred to refer to the movements as historic incidences.