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CYCLICITY OF GROWTH IN UKRAINE: BIPHASIC ECONOMY

Nataliia Servetnyk.
Taras Shevchenko Kyiv National University

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Introduction. The cyclical character of economic development is one of the most interesting problems today. Researchers not only study its features, but also predict its effects and the possible development measures to smooth its negative influence. This problem becomes more important because of increasing of integration and openness of Ukraine to external markets.

Cyclicity is shown in the following forms:

- 1) Classic forms: periodicity, trend, multidimensionality;
- 2) Modern forms: modified amplitude, increased seasonal fluctuations, synchronization, globalization, interconnection and interdependence of cycles. [7, p.64]

Principals of cyclical development are systematized by professor Galchynskiy. The first principle says the cyclicity always corresponds to history of any social phenomenon whereby all systems have its own beginning and end.

All cycles are interdependent and subordinated. It is the second principle.

The third principle divides cycles on types: global civilization cycles, social cycles and economic cycles. Economic cycles are divided into short-, medium- and long-term cycles, financial and monetary cycles and cycles of technological changes.

And the last fourth principle is: a synchronization of cyclical fluctuations is formed by itself. But it does not exclude the influence of external factors. They can stimulate or restrain the amplitude of fluctuations. [2, p.231]

Literature review. There has been a substantial amount of research on real business cycles since the seminal paper of Finn Kydland and Edward Prescott published in 1982. To forecast the next phase of cycle it is necessary to know the leading indicators of economy. The most significant researches of last decades are "Business Cycles, Indicators and Forecast" by J. Stock, "Turning points in International Business Cycle: Analysis of Leading Indicators of Great 7" by M. Artis, "Basic Economic Indicators" by R. Yamarone. [9, p.17]

It became apparent that in order to identify economic cycles, one had to remove from the series seasonal fluctuations, associated with short-term behavior, and the long-term secular trend, associated mostly with technological progress. Burns and Mitchell provided perhaps the first main reference point for much of the posterior research. Statistical measurement of the cycle was broadly seen as capturing the variation of the series within a range of frequencies, after the series has been seasonally adjusted and detrended. (Burns and Mitchell suggested a range of frequencies associated with the cycles with in the period of, roughly, 2 and 8 years.)

Statistical methods were devised to estimate cyclical variation, and these gradually evolved towards methods fundamentally based on the application of moving average filters to the series; see, for example, Bry and Boschan. These moving-average filters were "ad-hoc" filters, in the sense that they were fixed, independent of the particular series being analyzed. The last 20 years have witnessed methodological research on two broad fronts. The first front dealt with further development of the moving-average type of approach; the second front was the development of more complex statistical approaches oriented towards capturing cyclical features, such as asymmetries and varying period lengths that could not be captured with univariate linear filters. Examples of research in both directions can be found in Sims, Lahiri and Moore, Stock and Watson and Hamilton, Hodrick and Prescott. Although the first approach is known to present serious limitations, the new and more sophisticated methods developed in the second approach are at an early stage, and have proved to be still un-

reliable, displaying poor behavior when moving away from the sample period. [3, p.5 - 6]

Problem. There is a great number of classifications of cycles. The most common of them are: short-term, medium-term and long-term.

Short-term cycles are manifest in the periodic increase and decrease of buying activities. They are manifest in fluctuations of economic growth rates. These are not significant since the absolute majority of the population has no idea about the stage of the cycle in which the economy of the country is at this or that particular moment. Neither have they any idea about the existence of such cycles. But in market economy they are easily distinguishable by constructing the dynamic lines of macroeconomic indications: the volumes of GDP, retail trade, industrial production, etc.

Medium-term cycles are most thoroughly researched in scholarly literature. They are connected with periodic loss of correspondence between demand and offer on the macrolevel, this being manifest in overproduction of merchandise as compared with the demand with the ensuing decline in production.

It is known that the material foundation of a long-term cycle lies in the life cycle of production infrastructure. According to the first "correctness" of N. Kondratiev, at the beginning of the cycle's increase stage there is a considerable change in the life of society due to scientific and technical progress that causes mass replacement of production infrastructure and bringing in accordance with it the active and passive parts of principal funds. Since the replacement of equipment happens after 7-11 years with the production infrastructure remaining unchanged for 40-60 years, there is a conflict between the active and passive parts of principal funds which is aggravated with every equipment replacement. This results in the situation where, after a definite period of time, the relatively obsolete production infrastructure does not permit to implement the potential of economic growth in full, that potential which the active part of funds has. As a consequence, the economy passes to the decrease stage of the long-term cycle. Just that is happening today.

However, there are a number of circumstances modifying the action of the long-term cycle mechanism in such a way that they can altogether remove its material foundation. The establishment of information society, replacing the industrial stage of development, leads to the state when the production infrastructure stops playing an important part in determining the rates of economic development since, on the one side, a considerable part of working processes can take place without any buildings with long lifespan and, on the other hand, even those new buildings that are used are mobile, relatively cheap and designed to be exploited during ten years. All this makes the economic theory reconsider the "long wave" mechanism taking into account the transition to new economy. [4, p.6 - 12]

Schumpeter proposed a typology of business cycles according to its periodicity:

- Kitchin cycle of 3–5 years. This is also termed as the minor cycle which is of just about forty five months gap. It is well-known after the name of British economist Joseph Kitchin who made a differentiated a major and a minor cycles (in nineteen twenty three). On the basis of his research he concluded that a major cycle is composed of two or three minor cycles of forty five months.
- Juglar cycle of 7–11 years. This cycle is also termed as the major cycle. It is defined "as the fluctuation of business presentation among successive crises." Clement Jugler, French economist presented those periods of prosperity, crisis and liquidation adopted each other always in the same order. Later economists have come to the end that a Jugler cycle's duration is on the average nine and a half years.
- Kuznets cycle of 15–25 years. Simon Kuznets propounded a new type of cycle the secular swing of sixteen to twenty two years which is so propounded that it dwarfs the seven to eleven years cycle into associated insignificance. This has come to be known as the Kuznets cycle.
- Kondratieff wave or cycle of 45–60 years. N.D.Kondratieff, the Russian economist came to the conclusion that there are longer waves of cycles of more than fifty years duration made of six Jugler cycles. A very long cycle has come to be known as the Kondratieff wave.

There is another one interesting but debatable and not purely classical approach to time scale systematization of economic cycles in four groups (the super long cycle with duration averages 53-54 years; the long cycle with length of about 18 years; the medium cycle coverings approximately 10 years and the short term cycle averaging 5 years). [1, p.6]

Cycles of different periodicity overlap each others; it complicates the procedure of their identification. The choice of statistical tools also influences the identification of cycle's type.

Results. In this research GDP was chosen as the main indicator of business activity. We have sufficient data, so we can use such algorithm:

1. To build regression $y_t = a_0 + a_1 t_r + \varepsilon_t$ for the group of n first observations, where t_r - trend, a_0, a_1 - regression coefficients, ε_t - resid.
2. To make step 1 again, changing the sample at one-time period. The process is finished, when the last regression includes the last observation.
3. The value of coefficient a_1 is analyzed. The value of the coefficient form the new time series. If the components of new series are higher than a mean trend, there is a positive phase of cycle, inverse situation indicates negative phase. The mean trend means slop of the trend in the long run, built on all observations.

The main advantage of this method lies in the fact that the sequence of values a_1 can be easily forecasted by using standard methods. So we can get forecasts of initial time series for the future. The Hodrick-Prescott filter is an alternative, but it cannot make predictions as to further changes.

The choice of the necessary number of situations and lags depends on such factors:

- Stability of model. i.e. invariance model coefficients;
- The average prediction error on previous data;
- The error of the most probable forecast.

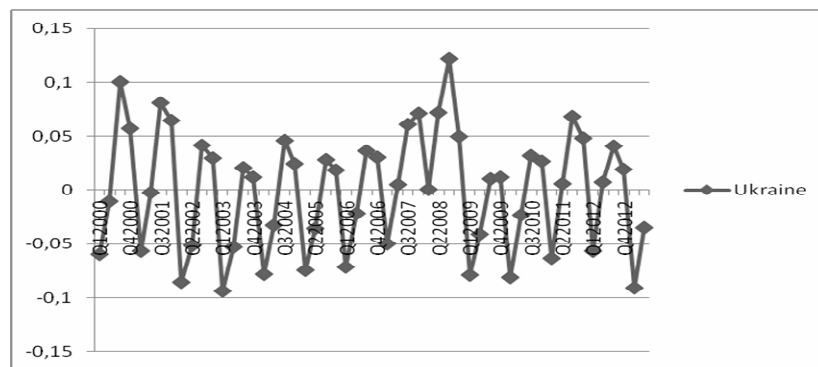


Fig. 1. GDP cycle in Ukraine

Source: <https://www.bank.gov.ua>

In biphasic economy cycles of growth and recession periodically replace each other.

Table 1. Coefficients estimation

	Transition matrix		Coefficients				
			β_0	β_1	β_2	β_3	β_4
Situation 1	0,32	0,68	0,13	1,03	-0,25	0,69	-0,32
Situation 2	0,64	0,36	0,03	1,17	-1,19	0,91	0,09

Source: authorial calculations

For biphasic economy we have identified such periods:

Period 1 (1996 – 1998). From mid-1996 to the 2nd quarter of 1998 the GDP growth rate increased. In the 1st quarter of 1998 some inhibition was observed.

Period 2 (1999). During this period inhibition took place. The reason for this was world financial crisis. But devaluation and import restrictions led to the rapid growth during the next period.

Period 3 (early 2000 – end of 2001). This period is characterized by significant recovery of economy. GDP and other important macroeconomic indicators increased. Inflation rate was lower than expected. The credibility to hryvna rose and currency reserves increased. At the same time incomes and wages increased too. [3, p.21]

Period 4 (2002). Inhibition lasted for 4 quarters of 2002.

Period 5 (2003 – 3d quarter of 2004). At this period another recovery occurred. But in the 4th quarter of 2004 growth rate decreased. It was the start of the next reduction phase.

Period 6 (end of 2004 – 2005). The significant political changes led to economic transformations. The structure of GDP was changed, and the growth rate reduced.

Period 7 (2006 – early 2008). The next growth phase began.

Period 8 (mid-2008 – 2011). This period was the beginning of growth rate reduction. The world financial crisis has played a significant role.

Table 2 contains a forecast for the next 5 periods.

Table 2. Forecast

	1	2	3	4	5	Probability
Situation 1	313058	344651	371487	386679	414837	
Situation 2	272302	257393	266902	286344	288197	
Avaraged	313009	284942	345085	295665	392474	
Most probable	313058	257393	371487	238012	436596	

Source: authorial calculations

Despite the taken measures reduction continues. There are such ways to overcome negative effects of crisis:

1. To improve the control of banking;
2. To provide government guarantees to banks as to foreign debts in foreign currency;
3. To demand from banks the lending of the most strategic sectors of economy;
4. To return the credibility of banks;
5. To help small and medium businesses.
6. To focus on such important points as employment, salary, financial stability and currency exchange.

Conclusions. This method lets identifying phases of economic cycles. But it has its disadvantages

1. Analyzing the nominal values the coefficient \hat{a}_1 can increase even with decreasing phase of cycle. To avoid this it is necessary to use only normalized values.
2. The method identifies a phase of the cycle, after which identification of a few years place. So the researcher gets the information with delay. It is a significant problem for actual calculations. On the other side, we can use the method of identification with previous data.

The application of this method was intended for biphasic form of business cycle (growth – fall). For other forms (3 or 4 phases) there is another algorithm of formalization of the parameter.

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Nataliia Oleksandrivna Servetnyk, a post-graduate student, Taras Shevchenko Kyiv National University. **Cyclicality of growth in Ukraine: biphasic economy.** The paper studies the length of GDP cycles in Ukraine. The statistical techniques of cycle measurement are analyzed. The research gives recommendations as for overcoming the financial crisis influence.

Keyword: cyclicality, periodicity, gross domestic product, crisis, growth rate.

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Серветник Наталія Олександрівна, аспірант кафедри економічної кібернетики, Київський національний університет імені Тараса Шевченка. **Циклічність економічного зростання в Україні: двофазна економіка.** У статті досліджується тривалість українських циклів ВВП. Аналізуються статистичні методи вимірювання довжини циклів. Надано рекомендації щодо подолання негативних наслідків кризи.

Ключові слова: циклічність, періодичність, валовий внутрішній продукт, криза, темп зростання.

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Серветник Наталия Александровна, аспирант кафедры экономической кибернетики, Киевский национальный университет имени Тараса Шевченка. **Цикличность экономического роста в Украине: двухфазная экономика.** В статье исследуется продолжительность украинских циклов ВВП. Анализируются статистические методы измерения длины циклов. Даются рекомендации по преодолению негативных последствий кризиса.

Ключевые слова: цикличность, периодичность, валовой внутренний продукт, кризис, темп роста.