Dating Moroccan Business Cycle.

Auteur 1 : FANCHY Hajar.
Auteur 2 : EL MZABI Amal.
Auteur 3 : HEFNAOUI Ahmed.

FANCHY Hajar, (Economics Phd student, Researcher)
Economic Performance and Logistics Laboratory
Faculty of Law, Economics and Social Sciences, Mohammedia
Hassan II University Casablanca

EL MZABI Amal, (Professor)
Economic Performance and Logistics Laboratory
Faculty of Law, Economics and Social Sciences, Mohammedia
Hassan II University Casablanca

HEFNAOUI Ahmed, (Professor)
Economic Performance and Logistics Laboratory
Faculty of Law, Economics and Social Sciences, Mohammedia
Hassan II University Casablanca.

Déclaration de divulgation : **L'auteur n'a pas connaissance de quelconque financement qui pourrait affecter l'objectivité de cette étude.**

Conflit d'intérêts : **L'auteur ne signale aucun conflit d'intérêts.**

Pour citer cet article : **FANCHY. H, EL MZABI.A, HEFNAOUI.A (2024) « Dating Moroccan Business Cycle», African Scientific Journal « Volume 03, Numéro 26 » pp: 0842– 0856.**

Date de soumission : Septembre 2024

Date de publication : Octobre 2024

DOI : 10.5281/zenodo.14036016

Abstract

This article examines methods for extracting and dating the Moroccan business cycle, emphasizing their importance for the formulation of economic stabilization policies. It compares the result of three filters—Hodrick-Prescott (HP), double HP, and Christiano-Fitzgerald (CF)— in extracting the cyclical component of Morocco's quarterly GDP data from 1998 to 2023. The CF filter is found more effective in identifying expansion and recession phases via the BBQ algorithm. The study reveals thirteen peak-to-peak and twelve trough-to-trough cycles, with recession phases being longer and more volatile than expansion phases. These findings underscore the need for targeted strategies to mitigate recession impacts and promote economic stability.

Keywords : Moroccan Business Cycle, Business Cycle extraction, Business Cycle dating, CF filter, BBQ algorithm,

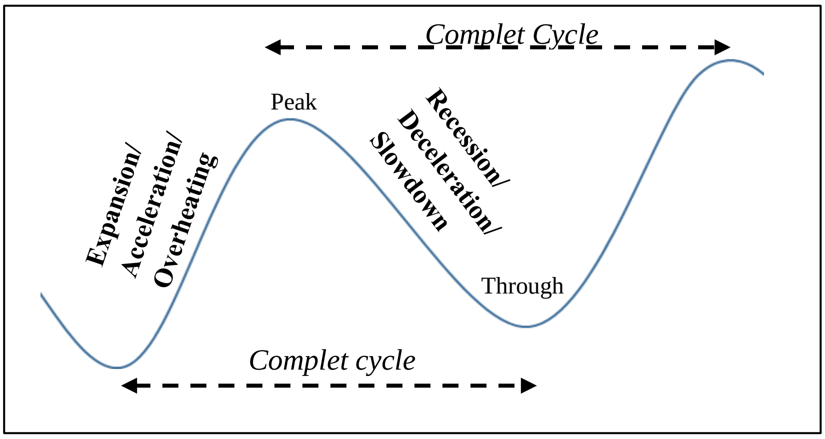
African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

Introduction

Given the high level of uncertainty associated with recent events such as the global financial crisis, the covid19 crisis and the prevalence of geopolitical conflicts, it becomes, over the past decades, imperative to examine the cyclical fluctuations in order to enhance insights and implement strategies that can ensure a certain degree of economic stability.

These fluctuations are emphasised by the concept of the business cycle, which can be defined in various approaches, as illustrated in the literature. The classic cycle comprises alternating phases of expansion and recession (Burns & Mitchell, 1946). In contrast, the growth cycle describes short-term fluctuations in economic activity relative to its long-term trend and identifies phases of overheating and slowdown (Lucas, 1977). The acceleration cycle examines fluctuations in economic growth, focusing on changes in the rate of the growth process, particularly periods of acceleration and deceleration. The business cycle can be generally illustrated as shown in Figure 1.

Figure 1: Business Cycle Illustration



Source : Authors

The article aims to examine the outcomes of principal methodologies for extracting the cyclical component of the business cycle, as defined by Lucas. This addresses our key question : ***which approach provides the most accurate estimation of the Moroccan business cycle ?*** The answer will present an analytical framework for business cycle dating, with a particular focus on one of the cyclical components extracted using the evaluated methodologies.

Therefore, the objective of this study is to contribute to both national and international literature by presenting a comparative analysis of methods for extracting the cyclical component and providing new insights into business cycle dating. The findings of this study could also provide useful guidelines for researchers and decision-makers engaged in developing economic policies

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

and forecasting trends. The paper is organised as follows. The next section reviews various techniques for extracting the cyclical component and determining turning points. The second section describes the adopted methodology and evaluates the results obtained, including the datasets used, the criteria for selecting the reference indicator, and the characteristics of the Moroccan business cycle. The last section provides concluding remarks.

1. Literature review

1.1. Business Cycle measuring

A survey of existing research reveals the existence of a number of techniques for extracting the cyclical component of a time series. However, three methods in particular are frequently employed : Hodrick-Prescott (HP), double Hodrick-Prescott (DHP) and Christiano-Fitzgerald (CF).

1.1.1. Hodrick Prescott filter

The most widely recognised tool for isolating the trend component from the cyclical one (Gyomai & Guidetti, 2012 ; Mazzi & Scocco, 2003 ; Nilsson & Gyomai, 2011 ; Wolf et al., 2020). The HP filter is considered to be the simplest of the advanced filtering techniques (Benes & N'Diaye, 2004) that can be applied to any time series (Hodrick & Prescott, 1997). In order to apply this technique, it is first necessary to impose a constraint on the sum of the deviations between the original series and its trend as follows :

$$\min_{\{\mathbf{T_t}\}} \sum_{\mathbf{t=1}}^{\mathbf{T}} \left((\mathbf{y_t} - \mathbf{T_t})^2 + \boldsymbol{\lambda}[(\mathbf{T_{t+1}} - \mathbf{T_t}) - (\mathbf{T_t} - \mathbf{T_{t-1}})]^2 \right) \quad \textit{(1)}$$

Where $\mathbf{y_t}$ is the observed value of the time series at time, $\mathbf{T_t}$ is the smoothed or trend value of the time series at time t and $\boldsymbol{\lambda}$ represents the smoothing parameter or penalty term.

The first term in the expression represents the sum of the squares of the observed values minus the estimated trend values, while the second term represents the penalty applied to changes in the trend rate. This term favours the maintenance of a smooth, gradual rate of change in the estimated trend. The parameter λ, which serves as a smoothing parameter, determines the sensitivity of the trend component to short-term variations. An increase in the value results in a more gradual trend, whereas a decrease permits a more exact alignment with the original series.

The HP filter is distinguished by its symmetry in the data smoothing process, thereby ensuring a degree of consistency in the treatment of data at different points in the time series. In other words, to estimate the trend at a given point, the filter utilises information both before and after that point. However, as the data period draws to a close, the filter becomes increasingly asymmetric (Hamilton, 2018). In other words, the filter is prone to underestimating or

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

overestimating the trend towards the end of the series, contingent on its response to the loss of information from future data. This potential bias must be taken into account when interpreting the results obtained from the Hodrick-Prescott filter, particularly when analysing long-term data where the end of the period can have a significant influence on the conclusions drawn.

1.1.2. Double Hodrick Prescott filter

This is an extension of the traditional HP filter approach formulated to enhance the precision of the cycle estimate by executing two consecutive smoothing operations (Gyomai & Guidetti, 2012). In the initial phase, the standard HP filter is employed to derive an initial approximation of the trend. Subsequently, the initial estimate is subjected to a second smoothing iteration using the same smoothing parameters λ employed in the first iteration. This aims to further reduce fluctuations in the estimated trend, thereby obtaining a more refined and potentially more accurate estimate of the time series trend. The second application of the HP filter is as follows:

$$\min_{\{C_t\}} \sum_{t=1}^{T}\left((R_t - T'_t)^2 + \lambda'[(T'_{t+1} - T'_t) - (T'_t - T'_{t-1})]^2\right) \qquad (2)$$

The cyclical component, represented by $R_t = y_t - T_t$, is the result of the first iteration of filtering, and the new trend by the variable T'_t.

It should be noted that the use of double HP can also induce oversmoothing, which is characterised by an excessively regular estimated trend that may not faithfully reflect the actual variations in the time series.

1.1.3. Christiano-Fitzgerald filter

It is an advanced time series filtering technique based on spectral analysis of the time series. The filter aims to overcome some of the limitations of the Baxter King filter, taking into account the specific characteristics of macroeconomic data. Gyomai and Guidetti (2012) and Nilsson and Gyomai (2011) asserted that CF outperforms BK over a long series. CF filter, unlike the BK filter, is defined to be optimal for a specific time series, rather than being universally applicable. This specificity allows the CF filter to offer greater precision in extracting the cyclic component. The CF filter employs a bandpass to isolate the frequencies corresponding to business cycles, while eliminating trend components and irregular fluctuations. The bandwidth is typically set to encompass business cycles with periods between 6 and 32 quarters, in accordance with the definitions of Baxter and King. A general formula for the CF filter is presented below :

$$\hat{y}_t = \sum_{k=-N}^{N} \omega_k y_{t+k} \qquad (3)$$

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

Where : $\hat{y}_t$ is the filtered series, ω_k is the filter weights and N is the number of observations used for filtering. The weights ω_k are calculated by minimising the filtering error, taking into account the specific characteristics of the time series.

In order to prevent the introduction of a phase shift between the initial series and the filtered series, the CF filter is designed to be symmetrical. This symmetry ensures that the time lag introduced by filtering is minimised, thus preserving the synchronisation of the phases of the business cycle in the filtered series.

In contrast to the Baxter-King filter, which is universal and independent of the specific characteristics of the time series, the CF filter is adaptive. This adaptability represents a significant advantage, as it allows the CF filter to more effectively capture the distinctive dynamics of each time series. The CF filter employs optimisation techniques based on the statistical properties of the series to calculate the weights ω_k, enhancing the precision of the extracted cyclical component.

Compared to alternative filters like the HP filter and the BK filter, the CF filter provides greater flexibility and accuracy in adapting to particular datasets. Although the HP filter is often criticised for excessively smoothing data and the BK filter has limitations in terms of the number of observations required, the CF filter manages to balance these aspects by offering a robust and adaptable solution.

1.2. Business cycle dating

It involves the identification of turning points and the delimitation of transitions between different phases of the economy. This approach is based on a range of techniques, which can be divided into parametric and non-parametric categories. Parametric techniques offer a more rigorous structure and enable more sophisticated analyses of economic dynamics, but they require specific assumptions about the shape of business cycles. In contrast, non-parametric techniques are simpler to implement and less sensitive to model specification errors. However, they may be less accurate in certain contexts. Nevertheless, Chauvet and Piger (2008) and Hamilton (2011) demonstrate that the regime-switching model and the Bry-Boschan algorithm match the NBER dates with remarkable precision. Consequently, this paper will focus on non-parametric methods.

1.2.1. The Bry Boschan algorithm

The Bry Boschan algorithm is a non-parametric algorithm applied to monthly data, which is the benchmark for identifying turning points in a business cycle. This technique is considered the most traditional and relatively simple to apply, preferred for its greater transparency compared

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

to other methods. In their 2020 publication, Colombo and Lazzari describe the Bry Boschan (BB) algorithm as a means of automating the cycle dating procedure in accordance with the NBER tradition. The implementation of the algorithm is based on certain rules imposed by the definition of the cycle. According to this definition, a recession occurs from peak to trough, while an expansion occurs from trough to peak (cf. Burns & Mitchell, 1946).

The process of detecting turning points with the BB algorithm is comprised of several distinct steps. Initially, the algorithm identifies local extreme points, such as peaks and troughs, which are considered potential candidates for turning points. The determination of these points is based on a comparison of the values with those of neighbouring periods over a defined period. Subsequently, false signals are filtered out in order to ensure temporal consistency regarding the identified turning points. In this phase, the algorithm may remove reversals that are closely spaced or adjust the dates to ensure a minimum distance between successive reversals.

Subsequently, the identified turning points are refined in order to enhance their accuracy, using supplementary criteria or manual adjustments based on further analysis of the data.

It should be noted that the BB algorithm is based on two main rules : the minimum duration to be respected for each of the two phases and the entire cycle, which are five months and fifteen months, respectively ; and the alternation between peaks and troughs.

However, it is important to acknowledge that the BB algorithm has its limitations. In particular, it may be susceptible to the influence of irregular fluctuations if the data are not sufficiently smoothed. Furthermore, it does not automatically adapt to structural changes in economic series, necessitating manual adjustments.

1.2.2. BBQ algorithm

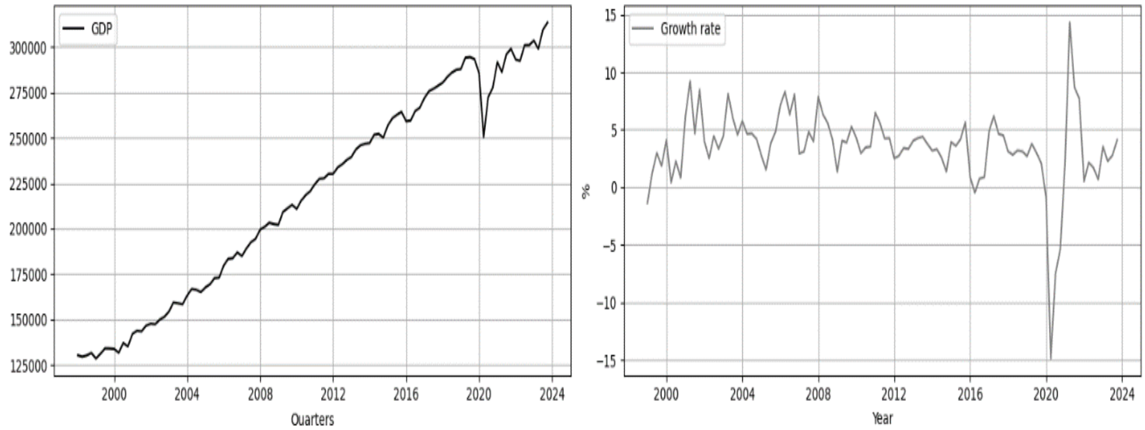
The extension of the BB algorithm is in line with non-parametric techniques. It was developed by Harding and Pagan (2002 and 2006) to be applied to quarterly data under the name of BBQ. The extension must generally meet three requirements : a minimum number of peaks and troughs must be identified, the peaks and troughs must be distinct from one another and vary over time, and the phases identified and the entire cycle must satisfy certain minimum duration conditions, such as those set out in the BB algorithm. Expansion and recession phases must last at least two quarters, and a complete cycle is made up of at least five consecutive quarters.

As this study will focus on the determination of short-term cycles, as in Drehmann et al. (2012), the censoring rules will be defined according to Harding and Pagan (2002).

2. Methodology & results

2.1. Data presentation

Figure 2: Moroccan quartely GDP growth



Source : Authors, HCP

In the context of analysing the reference cycle for a given country, it is customary to utilise gross domestic product (GDP) as the reference indicator. GDP provides a global and representative measure of economic activity, facilitating the comprehension of macroeconomic fluctuations and trends.

Our analysis uses GDP expressed in volume terms at the previous year's chained prices, adjusted for seasonal variations. Data is taken from the quarterly accounts published by the High Commission for Planning from the first quarter of 1998 until the last quarter of 2023, comprising a total of 104 observations.

Since the first quarter of 1998, Moroccan GDP has shown a consistent growth trajectory. However, this trend was significantly impacted by the emergence of the covid-19 pandamic. Moroccan economy has reached its lowest level in relation to its average over the last five years. Negative growth rates of 14,9% were recorded in the second quarter of 2020, as a result of the lockdown and the others measures introduced to deal with the spread of the virus. The national economy started to recover in the first quarter of 2021, but GDP did not return to its pre-crisis level until the end of 2023.

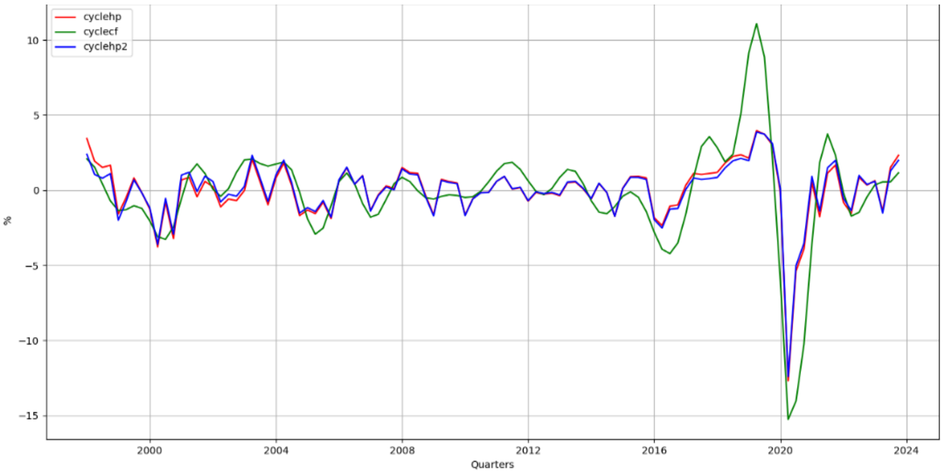
2.2. Cyclical component

In order to extract the cyclical component of GDP, a number of methods were employed, including the HP filter, the Double HP filter and the CF filter. A benchmark of methods for

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

extracting the cyclical component was established. Figure 2 illustrates a comparison of business cycles. The cycle extracted using the CF filter demonstrates greater precision in tracing the peaks and troughs. Those extracted by the HP filter and the double HP filter exhibit similar trends with minimal smoothing.

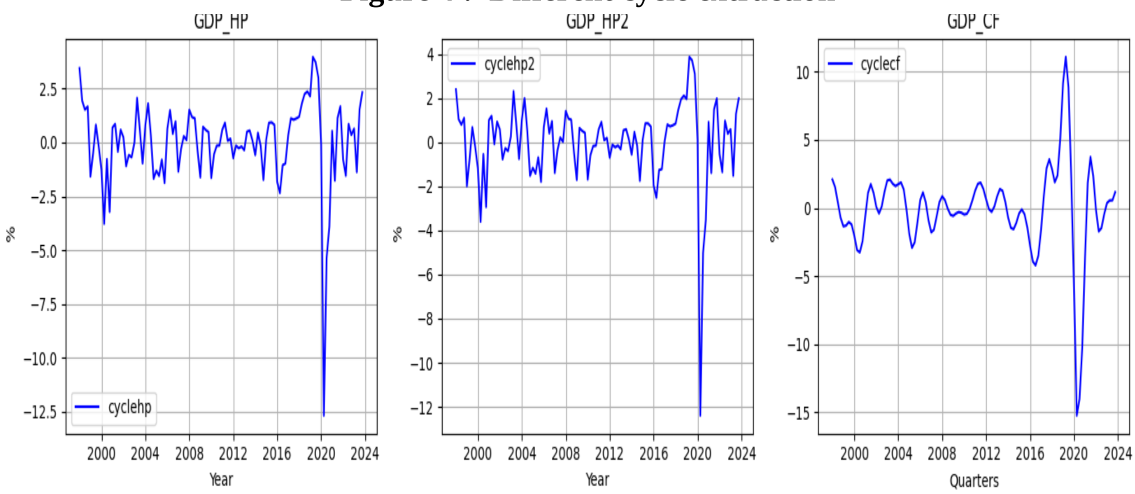
Figure 3: Juxtaposition of different results



Source : Authors estimation

The examination of the characteristics of the various cycles provided further insight and corroborated the findings presented above. The cycle obtained by the CF filter exhibits a greater average amplitude and higher regularity than those obtained by the HP and Double HP filters. This indicates that the CF filter is more sensitive to economic fluctuations and able to capture cyclical variations with greater detail. Consequently, the business cycle extracted by the CF filter may offer a more accurate representation of business cycle's phases, thereby facilitating a more comprehensive and precise analysis of economic dynamics.

Figure 4 : Different cycle extraction



Source : Authors'estimations

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

The superior accuracy and regularity of the mean amplitude achieved by the CF filter serves to reinforce its effectiveness in identifying business cycles. This method provides a more nuanced understanding of the distinctions between business cycle's phases, offering a more robust basis for economic policy formulation and business cycle forecasting. These findings are corroborated by a detailed analysis of the characteristics of the cycles, which confirms the robustness and relevance of the CF filter in extracting the cyclical component of GDP (table1).

Table 1 : overview of the key characteristics of the results obtained through the application of different methods

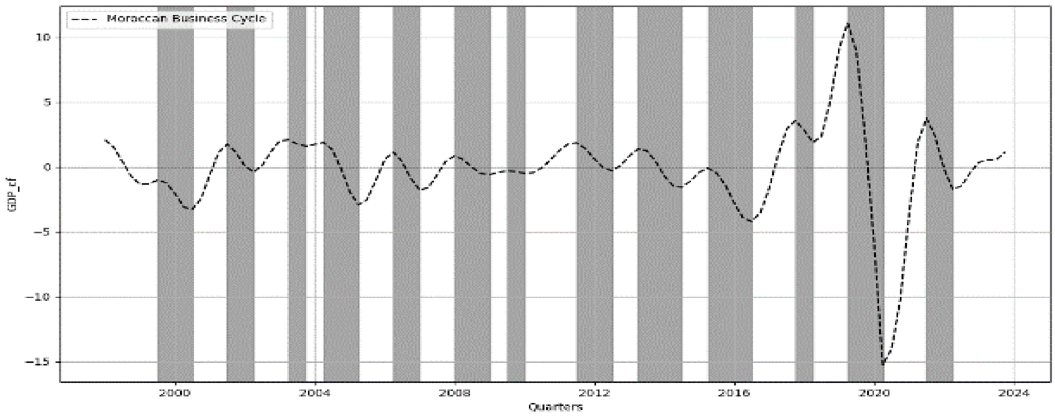
Method	Regularity	Mean amplitude
Filtre de Hodrick-Prescott (HP)	1,96	0,29
Filtre Double Hodrick-Prescott (DHP)	1,88	0,20
Filtre de Christiano-Fitzgerald (CF)	3,33	5,47

Source : Authors' calculations

2.3. Dating Business cycle

The application of the BBQ algorithm to the cyclical component derived from the CF filter has revealed the identification of thirteen peak-to-peak and twelve trough-to-trough cycles, with average durations of 7,2 and 7,3 quarters, respectively, over the period of our study (1998Q1-2023Q4) (see Figure 5).

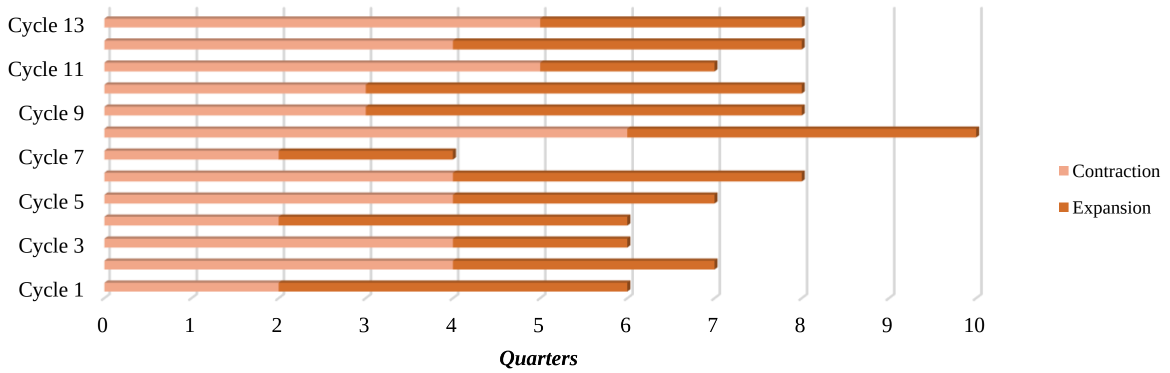
Figure 5: Dating the Moroccan business cycle



Source : Authors' calculations

The duration of a slowdown (peak to trough) fluctuates between two and six quarters, while that of an overheating (trough to peak) varies between two and five quarters. The mean duration of slowdown phases (3,7 quarters) is slightly longer than that of overheathing phases (3,5 quarters) (see Table 2). However, slowdown persist for a longer duration than overheathing in 46,2% of the identified cycles (see Figure 6).

Figure 6: Cycle duration in quarters



Source : Authors' calculations

It should be noted that the longest peak-to-peak or trough-to-trough cycle lasts ten quarters, from the first quarter of 2010 to the second quarter of 2012, and from the second quarter of 2015 to the last quarter of 2017, respectively.

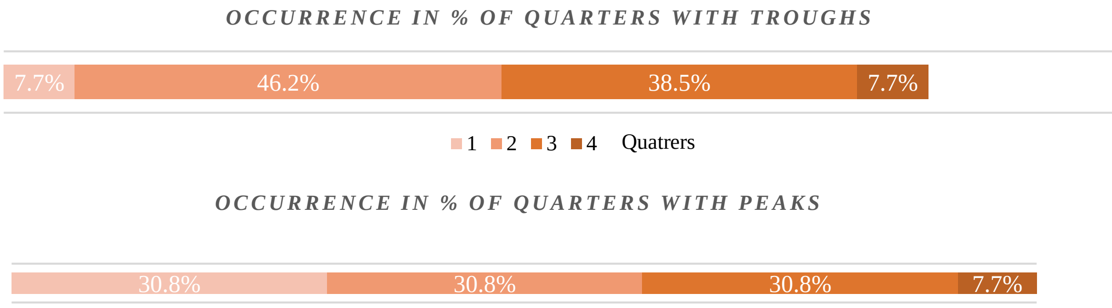
Table 2: BBQ algorithm results

BBQ dates		**Duration in quarter**			
Trough (T)	**Peak (P)**	**Expansion**	**Contraction**	**Cycle**	
		T to P	**P to T**	**T to T**	**P to P**
1999 Q1	**1999 Q3**	2	4	6	-
2000 Q3	**2001 Q3**	4	3	7	8
2002 Q2	**2003 Q2**	4	2	6	7
2003 Q4	**2004 Q2**	2	4	6	4
2005 Q2	**2006 Q2**	4	3	7	8
2007 Q1	**2008 Q1**	4	4	8	7
2009 Q1	**2009 Q3**	2	2	4	6
2010 Q1	**2011 Q3**	6	4	10	8
2012 Q3	**2013 Q2**	3	5	8	7
2014 Q3	**2015 Q2**	3	5	8	8
2016 Q3	**2017 Q4**	5	2	7	10
2018 Q2	**2019 Q2**	4	4	8	6
2020 Q2	**2021 Q3**	5	3	8	9
Mean		3,7	3,5	7,2	7,3
Median		4,0	4,0	7,0	7,5
Standard deviation		1,3	1,1	1,5	1,6

Source : Authors' calculations

Peaks during the study period were frequently reached in the first, second and third quarters, while troughs were generally identified in the second and third quarters (see Figure 7).

Figure 7 : Occurrence in % of turning points by quarter



Source: Authors' calculations

The identified recession phases generally coincide with a contraction or slowing of agricultural value added, except for the last two marked primarily by the effects of the covid-19 crisis and the inflationary pressures resulting from the bottleneck in world supplies and the Russian invasion of Ukraine.

Furthermore, these phases are more volatile than those of expansion, with average amplitudes of 4,4 and 4,3, respectively, and standard deviations of 6,8 and 5, 2, respectively.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

Conclusion

The ability to identify the business cycle and its turning points enables policymakers to define and adjust their stabilisation policies in a timely and effective manner. A comparative analysis of the principal methods for extracting the cyclical component, namely the HP, double HP and CF filters, has demonstrated that the CF filter offers a superior representation of the expansion and recession phases of the Moroccan economic cycle. Indeed, the CF filter is distinguished by its capacity to accurately capture economic fluctuations, due to a higher average amplitude and greater regularity than the other methods.

The BBQ algorithm was employed to ascertain the duration and intensity of the expansion and recession phases of the Moroccan business cycle from 1998 to 2023. The results indicated that recession phases tend to last slightly longer than expansion phases, and that contraction phases are generally more volatile. Furthermore, the cyclical fluctuations determined confirm that the national economy is highly dependent on supply shocks (Fanchy & al. 2023).

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

REFERENCES

Burns, A. F., & Mitchell, W. C. (1946). Measuring business cycles. *National Bureau of Economic Research*, *64*(2), 311–318. https://doi.org/10.2307/1882698

Benes, J., & N'Diaye, P. (2004). A multivariate filter for measuring potential output and the NAIRU: application to the Czech Republic.

Bry, G., & Boschan, C. (1971). Front matter to" Cyclical Analysis of Time Series: Selected Procedures and Computer Programs". *In Cyclical analysis of time series: Selected procedures and computer programs (pp. 13-2). NBEr*.

Chauvet, M., & Piger, J. (2008). A comparison of the real-time performance of business cycle dating methods. *Journal of Business & Economic Statistics, 26(1), 42-49.*

Drehmann, M., Borio, C. E., & Tsatsaronis, K. (2012). Characterising the financial cycle: don't lose sight of the medium term!.

Fanchy, H., El Mzabi, A., & Hefnaoui, A. (2023). Identification of fluctuations origins in the Business Cycle in Morocco: Reduced DSGE modelling. African Scientific Journal.

Gyomai, G., & Guidetti, E. (2012). OECD system of composite leading indicators-April 2012.

Hamilton, J. D. (2011). Calling recessions in real time. *International journal of forecasting, 27(4), 1006-1026.*

Hamilton, J. D. (2018). Why you should never use the Hodrick-Prescott filter. *Review of Economics and Statistics, 100(5), 831-843*.

Harding, D., & Pagan, A. (2002). Dissecting the cycle: a methodological investigation. *Journal of monetary economics, 49(2), 365-381*.

Hodrick, R. J., & Prescott, E. C. (1997). Postwar US business cycles: an empirical investigation. *Journal of Money, credit, and Banking, 1-16.*

Lucas, R. E. (1977). Understanding business cycles. *Carnegie-Rochester Confer. Series on Public Policy*, *5*(C), 7–29. https://doi.org/10.1016/0167-2231(77)90002-1

Mazzi, G. L., & Scocco, M. (2003). Bussiness cycles analysis and related software applications. *Luxemburgo: Office for Official Publications of the Europeans Communities*. Recuperado el, 26

Nilsson, R., & Gyomai, G. (2011). Cycle extraction: A comparison of the phase-average trend method, the Hodrick-Prescott and Christiano-Fitzgerald filters.

Wolf, E., Mokinski, F., & Schüler, Y. S. (2020). On adjusting the one-sided Hodrick-Prescott filter. Available at SSRN 3536248.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

Apendix :

A1 : Expansion phase characteristics

Start	End	Duration	Amplitude	Severity
1999-01-01	1999-07-01	2	0,32	0,16
2000-07-01	2001-07-01	4	5,02	1,25
2002-04-01	2003-04-01	4	2,48	0,62
2003-10-01	2004-04-01	2	0,27	0,14
2005-04-01	2006-04-01	4	4,07	1,02
2007-01-01	2008-01-01	4	2,65	0,66
2009-01-01	2009-07-01	2	0,29	0,14
2010-01-01	2011-07-01	6	2,34	0,39
2012-07-01	2013-04-01	3	1,68	0,56
2014-07-01	2015-04-01	3	1,46	0,49
2016-07-01	2017-10-01	5	7,79	1,56
2018-04-01	2019-04-01	4	9,20	2,30
2020-04-01	2021-07-01	5	18,99	3,80

A2 : Characteristics of the recession phases

Start	End	Duration	Amplitude	Severity
1999-07-01	2000-07-01	4	-2,24	-0,56
2001-07-01	2002-04-01	3	-2,15	-0,72
2003-04-01	2003-10-01	2	-0,48	-0,24
2004-04-01	2005-04-01	4	-4,80	-1,20
2006-04-01	2007-01-01	3	-2,94	-0,98
2008-01-01	2009-01-01	4	-1,44	-0,36
2009-07-01	2010-01-01	2	-0,18	-0,09
2011-07-01	2012-07-01	4	-2,15	-0,54
2013-04-01	2014-07-01	5	-2,95	-0,59
2015-04-01	2016-07-01	5	-4,11	-0,82
2017-10-01	2018-04-01	2	-1,69	-0,84
2019-04-01	2020-04-01	4	-26,33	-6,58
2021-07-01	2022-04-01	3	-5,47	-1,82

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 26, Octobre 2024

A3 : Complete peak-to-peak cycle characteristics

Start	End	Duration	Amplitude	Severity
1999-01-01	2000-07-01	6	2,24	0,37
2000-07-01	2002-04-01	7	2,15	0,31
2002-04-01	2003-10-01	6	0,48	0,08
2003-10-01	2005-04-01	6	4,80	0,80
2005-04-01	2007-01-01	7	2,94	0,42
2007-01-01	2009-01-01	8	1,44	0,18
2009-01-01	2010-01-01	4	0,18	0,05
2010-01-01	2012-07-01	10	2,15	0,21
2012-07-01	2014-07-01	8	2,95	0,37
2014-07-01	2016-07-01	8	4,11	0,51
2016-07-01	2018-04-01	7	1,69	0,24
2018-04-01	2020-04-01	8	26,33	3,29
2020-04-01	2022-04-01	8	5,47	0,68