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A Business Cycle Indicator for Abu Dhabi

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According to the Abu Dhabi Economic Vision 2030, the main objective is to diversify its production base, and widen non-oil production. In addition to this growth strategy cyclical fluctuations are also a concern. Economic measures to increase the periods of economic prosperity and reduce the slowdown periods are implemented. To do so there is also a need for reliable tools to monitor the cyclical economic development. The composite indicator approach for economic change assessment, therefore, is seen as a proper method taken up by the Department of Economic Development (DED) in Abu Dhabi as a tool to assess actual short-term economic changes. However, there are no quarterly national accounts for Abu Dhabi at the moment and only a few short-term statistics. A suitable quarterly reference series for indicator assessment has to be constructed with temporal disaggregation methods. Since Abu Dhabi has a huge oil sector real income is used as a reference, because it reflects the economic situation better than real GDP. For the construction of the composite indicators various data sources are exploited.

Keywords: business cycle indicators, composite indicators, Abu Dhabi economic development, terms-of-trade, business tendency surveys, quarterly national accounts

Introduction

The aim of this paper is to use the composite business cycle indicator's approach to monitor and evaluate patterns in the development of Abu Dhabi's economy, in order to assess the current economic situation. Timely information on the state of the economy is a precondition for setting policies in a way that periods of economic recovery and boom are respectively extended; and recessionary periods shortened. At present published official statistics in Abu Dhabi, have a far too long time lag to fulfill the requirement of policy-making. The cycle indicator's approach is a methodology for timely monitoring economic change. It is used worldwide extensively in research papers, and is widely known in the applied literature[1]; it proved its reliability and

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[1] The OECD publishes for example composite indicators for all OECD member countries and a few emerging countries. The methodology of the OECD is discussed in OECD (2008).

advantages compared to theory-based econometric models particularly in assessing (and forecasting, an objective of this methodology at a later stage) cyclical turning points and short-term economic developments. Given the limited amount of data and the time lag of their availability in Abu Dhabi, this paper is trying to exploit as much as possible the existing information by developing a composite coincident indicator (CCI) designed to monitor the Abu Dhabi economy on a quarterly basis. The results of the project show that this endeavor is applicable in Abu Dhabi—like in many other countries in the world. However, it has to be stressed, that due to data limitations the presented composite indicator for Abu Dhabi is still of a preliminary nature. Improvements as well as refinements will be necessary as soon as the data basis becomes richer.

This new indicator confirms empirically and timely that the economy of Abu Dhabi was recovering from the effects of the global recession, but very recently faced a slowing down situation. Despite this slowdown is a very recent tendency, the general conclusion still would be that policy-making now should consider stimulating the economy, e.g., by increasing expenditure for productive infrastructure programs and avoiding measures which may reduce private consumption.

After careful further monitoring of the economic tendency, this policy may be enforced or reduced, depending on the cyclical behavior of the economy.

Background of the Paper

In modern economics, business cycles are defined as deviations of aggregate output from its long-run growth path (trend). Each market economy is affected by cyclical fluctuations. If this is not considered for economic monitoring, false conclusions might be drawn considering the strength or weakness of the economy. Timely information about the cyclical economic development is on the one hand very important for policy makers. They need timely information to adapt their policy. On the other hand the information is important for businesses and also for employees.

Motivation for the CCI Research

The main idea of the paper is to develop a data frame that can be used in a timelier monitoring of the economic situation in the Emirate of Abu Dhabi. The signals arriving from such systems may have an important impact on formulating policy recommendations and thus supporting decision makers in government but also—and this is equally important—in the business community. Composite indicators condense information contained in single indicators. Single indicators are summed up into one or a few indicators to get reliable signals. An example of a composite indicator and its construction is given in De Bondt and Hahn (2010). The OECD lists the following advantages of composite indicators (OECD, 2008, pp. 13-14):

- Can summarize complex, multi-dimensional realities with a view to supporting decision-makers;
- Are easier to interpret than a battery of many separate indicators;
- Can assess progress of countries over time;
- Reduce the visible size of a set of indicators without dropping the underlying information base;
- Thus make it possible to include more information within the existing size limit;
- Place issues of country performance and progress of the center of the policy arena;
- Facilitate communication with the general public (i.e., citizens, media, etc.) and promote accountability;

- Help to construct/underpin narratives for lay and literate audiences;
- Enable users to compare complex dimensions effectively.

These advantages motivated the DED in Abu Dhabi to construct a composite indicator for the cyclical development of the economy of Abu Dhabi.

Data Situation

With the growing importance of producing and using proper, accurate, and reliable economic information, there is an increasing demand for economic statistics with greater coverage and quality, and in a more timely fashion. The amount of data on the Abu Dhabi economy is limited in terms of available indicators and suffers of a lack of long-time series and high frequency data.

The collected data can be divided into two categories: firstly, desk data, which are collected from several official entities such as Statistical Centre of Abu Dhabi (SCAD), Abu Dhabi Securities Exchange (ADX), the National Bureau of Statistics in UAE and others, most of these data are annual and only few series are on a monthly base. Second, results of business and consumer opinion surveys, carried out on a quarterly basis, are used. These are collected by the Development Indicators and Future Studies Division within the DED, focusing on the perception of consumers and businessmen of the economic performance in Abu Dhabi. Economic tendency surveys are a well-established tool for monitoring economic cycles. There is a harmonized program of survey within the European Union (European Commission, 2006). The OECD also uses this kind of survey data heavily for their composite indicators. The OECD has also drafted a handbook with standards for the conduct of the surveys (OECD, 2003).

Procedures to Build a Composite Indicator: Construction of a Reference Series as a First Step

As a precondition for building composite indicators in this context reference series is needed. This reference series permits historical comparisons of individual candidate indicators as well as with the composite indicator. The comparison is required in a sense of quality assessment. Only by comparison indicators can be qualified as leading, lagging, or coincident. The reference series as a rule should:

- be reliable;
- contain a broad/important range of economic activity;
- beat least in a quarterly frequency.

As a reference measure of overall economic activity, the CPI deflated GDP (nominal annual GDP data as well as CPI data as published regularly by SCAD) is used. CPI deflated nominal GDP can be seen as a measure of real income. Because the economy of Abu Dhabi is very dependent on oil, real income reflects the economic situation better than real GDP. Real GDP underestimates the growth of real domestic income (GDI) whenever an increase of oil prices leads to an improvement in the external terms of trade. The distinction between real GDP and real GDI implies differences between the corresponding deflators for nominal GDP (Kohli, 2004).

Quarterly nominal GDP figures, actually for construction of the reference series required, are not yet available. However, this problem can be overcome by statistical procedures called “temporal disaggregation methods”. For transforming annual GDP figures in higher frequency reference series the internationally established Chow and Lin (1971) procedure is applied. The general idea behind this disaggregation method is

as follows: A relationship between the annual GDP and a suitable set of annualized high frequency indicators is estimated, usually with linear regression methods. Then the empirically based assumption is made that the estimated coefficients also hold on a finer time scale (in other words, they function as another reference series). The high frequency indicators then can be utilized to estimate a high frequency GDP. An important feature of this method is that the annual GDP figures are maintained in the high frequency data. The indicators modulate the sub-annual development.

The approach chosen for Abu Dhabi is based on a regression between the yearly oil price (spot Abu Dhabi) and the yearly nominal GDP. It is built on the hypothesis that the quarterly series of the oil price provides a correct depiction of a quarterly series of nominal GDP. The disaggregation is calculated with the software package ECOTRIM (Barcellan & Buono, 2002) which is supplied by Eurostat.

Finally, the estimated quarterly series for nominal GDP is deflated with the quarterly consumer price index (CPI) for Abu Dhabi.

Construction of the Composite Coincident Indicator for Abu Dhabi

General Procedure

The composite indicator construction algorithm consists of the following steps:

In the beginning as many as possible indicators with likelihood to provide actual information have to be collected and their characteristics be described. Then a first classification of the candidates must be made. A more sound assessment of indicators uses a statistical comparison with a reference series.

The single indicators qualifying for the construction of composite indicators must be selected by a stepwise procedure. This work is guided by the general characteristics of good indicators. Good indicators should be:

- meaningful and reliable;
- timely available;
- not revised considerably after publication;
- leading or coincident for the business cycle, so that timely signals are given;
- in a stable relationship with the reference series;
- able to give clear signals with minor “noise”.

Therefore, data which are available only annually are excluded from further analyses. Since a composite business indicator has to be available timely the used data should have a minor publication lag only and must not suffer from large revision after their first publication.

Meaningful, reliable, timely data which are not revised heavily are considered as potential business cycle indicators. To assess these data with the help of statistical methods, as explained above, a reference series for comparison is required.

Before individual indicators can be compared with the reference series, one has to examine, if statistical transformations are needed. Transformation requirements might be seasonal and trend adjustments. Since business cycles are fluctuations around a growth trend, business cycle indicators must be trend free (de-trended). High frequency fluctuations with a frequency below one year (or usually 1.25 or 1.5 years) are not considered as business cycles. Seasonal fluctuations fall in this category.

For the development of the Abu Dhabi composite indicators only sound statistical methods are used. Simple calculations like first differences or yearly growth rates, trend adjustments often have to be done. A

common filter which is applied to trend adjustment is the Hodrick-Prescott filter (Hodrick & Prescott, 1997). For seasonal adjustment, a standard international technique, the X-12-ARIMA procedure, is chosen (Findley et al., 1998).

Such prepared individual indicators can be analyzed statistically. They can be visually compared with the reference series and cross-correlations be calculated. These comparisons are used to restrict the list (numbers) of single indicators qualifying for the composite indicator.

The Composite Indicator for Abu Dhabi

According to the basic principles shown above, the selection of adequate indicators focuses on coincident indicators:

- with almost no publication lag (timeliness);
- of high correlation with the reference series and with pairwise correlations;
- which are at least quarterly available.

After choosing sensible transformation methodologies and processing through the selection method explained in the "General Procedure" part in this paper. The following individual quarterly indicators could be identified:

- Business permissions (seasonally adjusted, HP-de-trended) (Source: ADCCI);
- Firms' assessment of current business situation (source: Business Tendency Survey of DED);
- Personal income, current situation (source: Consumer survey of DED);
- Stocks end of quarter (Y-Y change in %; source: Abu Dhabi Security Exchange), CPI deflated (Source: SCAD and Statistical Office of UAE);
- Oil price (spot Abu Dhabi, Y-Y change in %; source: IEA), CPI deflated.

For further processing, all time-series are standardized, that means each individual indicator X is transformed to $Z = (X - \mu)/\sigma$ with μ—mean and σ—standard deviation of the observed indicator values. All transformed indicators have a zero mean and a standard deviation of one.

The Results of the Index

Figure 1 presents the composite indicator for Abu Dhabi. By the end of 2005 local financial markets collapse in the UAE, led to huge cash out flow (about 318 billion dirham) which led to the reversal negative on the movement of the market during the second half of the year 2005 and prices adjustment take over then.

By the beginning of 2007 the global demand for oil has increased with the economic improvement of the performance of some major countries such as China, India, and other Asian countries, the favorable conditions of the global economy increased oil prices, and oil countries revenues also, and creates a state of economic recovery in the emirate, allows the government to follow expansionary fiscal policy which coupled with huge efforts for diversifying the economy, and boasting FDI environment in Abu Dhabi, led to large FDIs injected in Abu Dhabi economy.

By the last quarter of 2008 the emergence of the global financial crisis and lower oil demand and lower oil prices economy entered in the case of a slowdown in growth closer to the economic recession continued until the beginning of 2009.

By stimulus measures taken by the government next to global financial crisis, the economy responses were well in 2009, compared to other emerging economies.

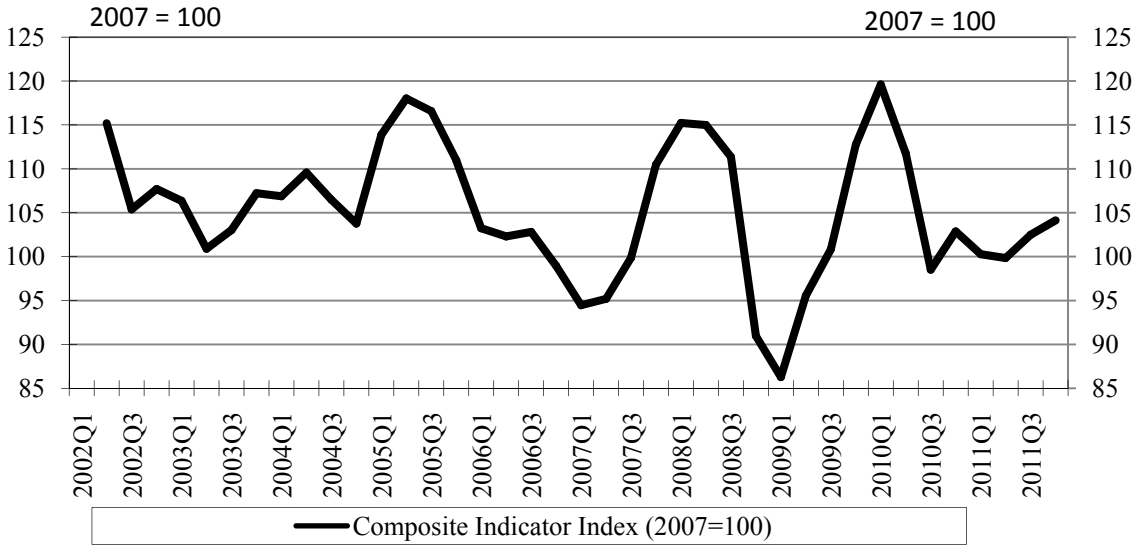

Figure 1. Composite indicator for Abu Dhabi (2007 = 100).

Where the government doubled the size of expenditure development and net loans and capital contributions in 2009 taking advantage of the volume of oil surpluses achieved in 2008, in order to stimulate aggregate demand and support the economic performance of the Emirate of Abu Dhabi in the face of financial crisis, which impacted on the achievement of the emirate for the fiscal deficit during the year 2009.

As a result of this deficit has pursued the Abu Dhabi government in 2010, a contractionary fiscal policy by reducing the size of development expenditure and net loans and capital contributions.

Until the end of December 2010 there were sub-indices except the index of new business licenses suggest an improvement in the performance of the economy of the Emirate of Abu Dhabi, however, the direction of the general index showed shallow economic recovery.

With the beginning of 2011, the political events in the Middle East influenced negatively on the optimism of the business community in the emirate and with the high prices of some inputs to production and shipping costs next to rising world food prices and fears of individuals from altitudes successive food prices all had an impact on the low level of optimism among individuals about their financial condition, which has had an impact on the pace of the re-economy to slow down.

By the end of 2011 the local government of Abu Dhabi announced intent to resume all unaccomplished projects that have been postponed since 2010, besides that the government announcing new mega projects in energy, transportation, free zones, tourism industry, and infrastructure in 2012, which contributed significantly to raising optimism among investors and businessmen in particular.

We can conclude that the performance of the Abu Dhabi economy had improved with the start of the third quarter of 2011, compared to the beginning of the year, as the value of the index rose from 99.8 points during the second quarter, to 102.5 points during the third quarter, ending the year at 104.12 points. The indicator shows a clearly cyclical behavior and noise is not too large.

With regard to the index sub-indicator concerning licenses issued to new members of the Abu Dhabi Chamber, the average annual rate of change for 2011 registered an increase of 15.5% compared to 2010, as shown in Figure 2.

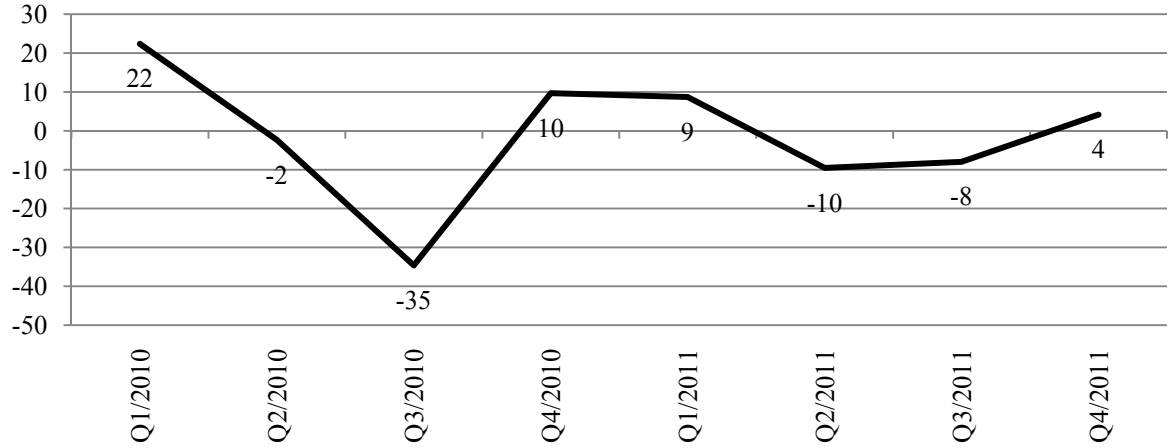

Figure 2. New business permissions (Q-Q change in %).

The general tendency of the data showed that most types of new licenses increased during the last quarter of the year; including business, industrial, crafts, and "Mubdia'a"[2] licenses, while professional licenses declined in number.

The number of licenses is shown in Figure 3. After the drop in the number of commercial licenses at the beginning of the year from 1,666 licenses during the first quarter to 1,499 licenses during the second quarter of the year, commercial licenses increased during the third quarter of 2011 from 1,408 licenses to 1,485 in the fourth quarter of the same year. Industrial licenses dropped from 31 licenses during the first quarter of 2011 to 19 licenses in the second quarter, then rose to 20 licenses during the third quarter and 21 licenses in the fourth quarter of the same year.

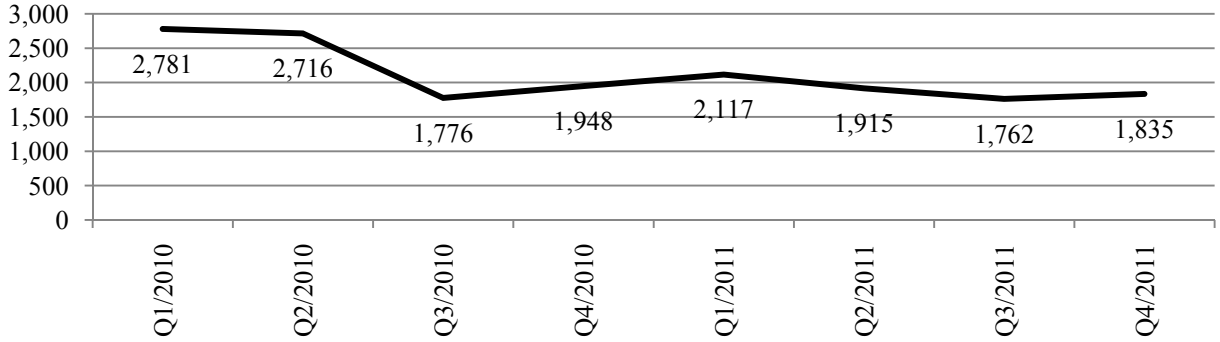

Figure 3. New business permission.

As for professional (crafts) licenses they also dropped from 256 licenses during the first quarter of 2011 to 237 licenses during the second quarter, and dropped further to 203 licenses during the third quarter. However;

[2] "Mubdia'a" program is one of the major initiatives proposed by the Abu Dhabi Businesswomen Council by a decision of the Executive Council in 2005. The program aims to provide an opportunity for the Emirati women to practice a number of commercial activities through the house by issuing license creative, also seeks to provide all the causes and factors of success of projects executed by citizens such as training opportunities and marketing, which contribute to strengthening the role of Emirati women in economic and commercial activities in the state. The program targets mainly women exercising slides business from home, such as households and producing graduates and housewives, divorcees, and widows. The program also works to support the ideas and initiatives Emirati women in specific areas, consistent operational nature with the privacy of the home.

they increased at the beginning of the fourth quarter of the year, to register 234 licenses during the fourth quarter of the same year.

"Mubdia'a" licenses dropped from 22 licenses during the first quarter, to 14 licenses during the third quarter, and rose to 15 during the fourth quarter of the same year. Professional licenses continued to decline in number from 127 licenses during the first quarter of 2011 to 118 licenses during the third quarter, and decreased further to 113 licenses during the fourth quarter of the same year.

The sub-index of Abu Dhabi Murban crude oil prices is given in Figure 4. Murban crude prices continued to rise during the fourth quarter of 2011 compared to the fourth quarter of 2010 as the Murban prices reached $108.4 to $85.6 in the two periods respectively.

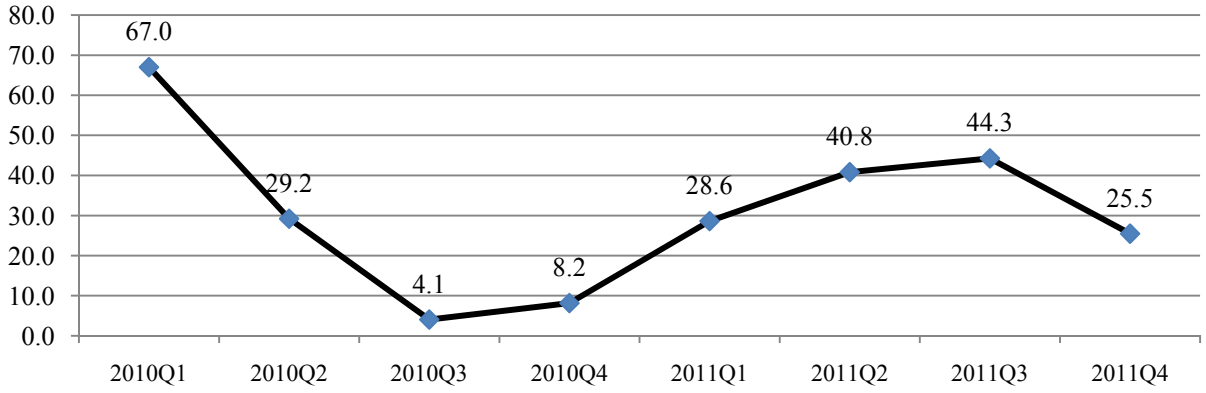

Figure 4. Oil price (spot Abu Dhabi, Y-Y change in %, CPI deflated) (USD/Barrels).

These hikes in oil prices were due mainly to the events and political upheavals witnessed by the Arab region, since the beginning of last January; which contributed directly to the rise in prices. Oil prices began to fall at the beginning of the fourth quarter of 2011, compared to the third quarter of the same year, as a result of Libya's return to the list of oil producers, with the improvement of the political situation. At the same time, the data indicated the presence of a gap between global supply and demand.

With respect to the sub-index of the financial status of individuals (shown in Figure 5), the index showed a rise in the level of optimism during the fourth quarter of 2011, compared to the period (January-September 2011) where the index scored 119 points, up from 105 points registered during the first quarter, whereas it scored 111 points during the second quarter and 100 points during the first quarter of the year. This was a result of the huge efforts exerted by the government to curb the rapid hikes in food prices.

With regard to the index sub-indicator concerning the firms' assessment of current business situation which is given in Figure 6, firms showed a remarkable confidence on current business situation after Q1 2011. This was attributed mainly to the high level of optimism among the economic establishment, about the future economic conditions in the Emirate, during the fourth quarter of 2011, compared to previous periods during the same year.

Figure 7 shows that the businessmen were optimistic about the economic performance of emirate of Abu Dhabi. The local government of Abu Dhabi had announced intent to resume all unaccomplished projects that have been postponed since 2010 such as transportation, tourism industries, infrastructure, energy, and free zones.

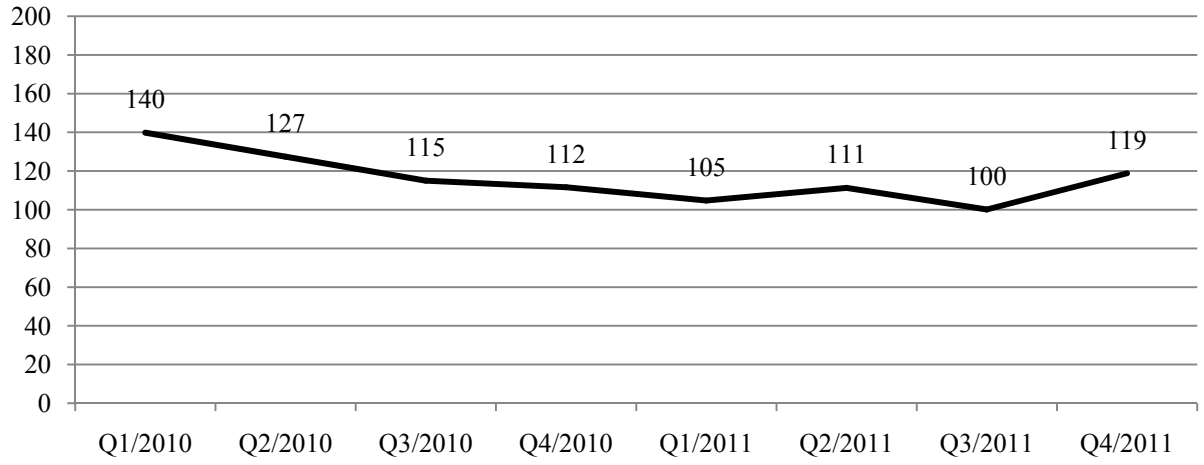

Figure 5. Personal income indicator.

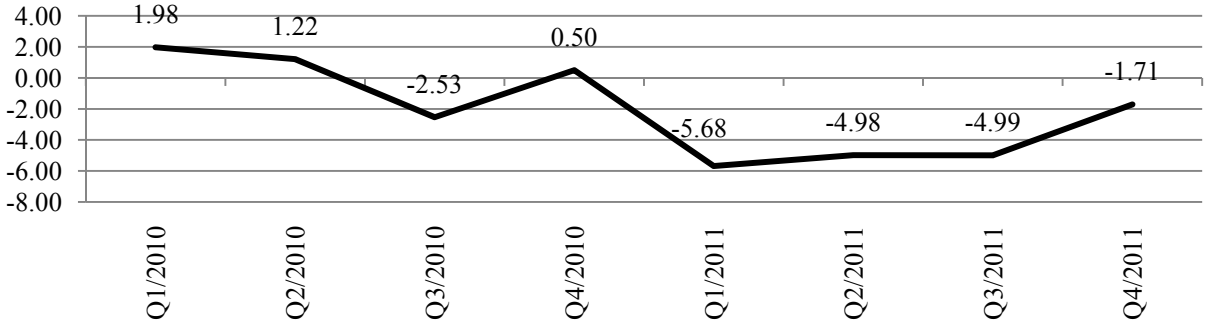

Figure 6. Firms' assessment of current business situation (Q-Q change in %).

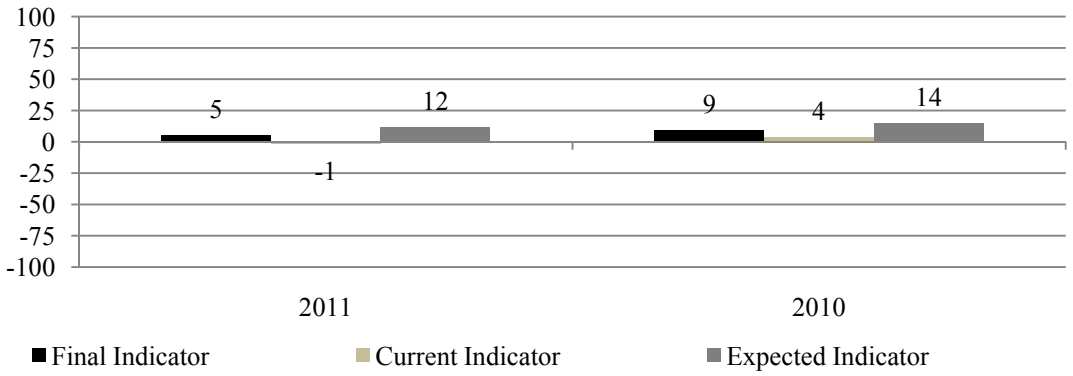

Figure 7. Final indicator and sub-indicators of firms' assessment.

With respect to the sub-index on the Abu Dhabi securities market index (as shown in Figure 8), the index experienced a sharp decline in performance during the current year, as it recorded 2,456.33 points during the last quarter of the year, the lowest since the first quarter of 2009, during the global financial crisis. Figure 8 shows that Abu Dhabi Securities Market general index tended to decline during 2011, reaching its lowest at the end of the last quarter of the same year, as a result was subjected to financial markets to external pressures, both companies credit rating which has issued reports that the challenges may face banks some companies, semi-government next year or from Morgan Stanley, which postponed its decision to upgrade the UAE stock

market to “emerging market status”, instead of a “frontier market” and to keep it under review for a potential upgrade during 2012, in order to allow more time for investors to evaluate the effectiveness of new models and systems in place in the market; and to allow time for regulators and stock exchanges to address the growing concerns of foreign investors on dealings.

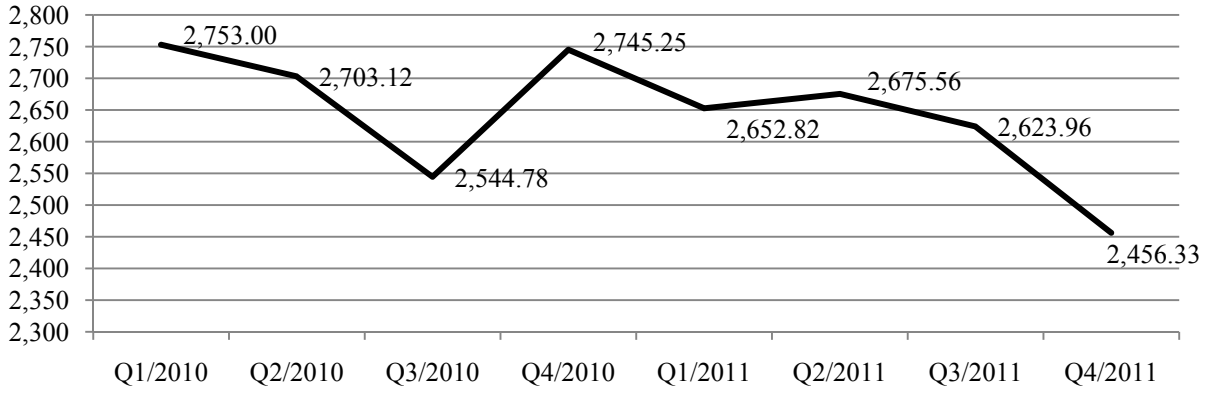

Figure 8. Abu Dhabi securities exchange index.

Summary

To monitor short-term economic fluctuations composite indicator can be used. Various indicators for many countries are calculated by different institutions. A well-known system of composite indicators is compiled by the OECD. In this paper a composite indicator for Abu Dhabi is presented. The circumstances in Abu Dhabi are different from many countries, especially the classical industrialized economies. Abu Dhabi is oil rich so that production is not used here as a measure for the economic situation. Instead, we focus on real national income. In addition the data situation is regarding quarterly data quite poor at the moment. GDP is available annually and only other statistics are often rarely. Despite these circumstances this paper shows that a composite indicator for Abu Dhabi can be constructed. The results seem to be reasonable so far. Further improvements are indeed possible, especially when further data are becoming available.

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