



Using the annual growth rate of exports palm from the Kingdom to the United States

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Doi: 10.21608/ajwe.2023.294557

استلام البحث : ٢٨ / ٩ / ٢٠٢٢

قبول النشر: ٢٧ / ١٠ / ٢٠٢٢

AHMED ,ABUZAR YOUSEF ALI (2023). Using the annual growth rate of exports palm from the Kingdom to the United States. *Arab Journal of water ethics*, AIESA, Egypt, April 6(6), 49-62.

<http://ajwe.journals.ekb.eg>

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Abstract:

Among the most important indicators that are usually used are those related to the level of growth, such as growth in profits, number of customers, growth in market share.....etc. The Main Objectives How can we measure Compound growth rates from year to year . The Steps to Calculate Compound Annual growth rate , Calculate Growth Rate then estimate the current year , Calculate the amount of constant growth , Compound Annual Growth Rate (GAGR) . The Result of The Study : Total growth rate = 188.2% , The Average annual growth = 37% , The Compound annual growth rate = 24% (Positive Value , Increasing) , predict the value of the end of 2021 =14632508.77 . The Study Recommended : Using the annual growth rate of exports palm from the Kingdom to the Other Countries , Conducting more similar studies to develop palm exports from the Kingdom of Saudi Arabia to various countries of the world , Increasing palm exports from the Kingdom to the United States of America to raise the value of the annual growth rate .

Key Word : compound , annual , growth rate , investors , internal rate , of return

Introduction Of the Study

What is the compound annual growth rate?

<https://www.businessinsider.com/personal-finance/cagr>

- CAGR stands for compound annual growth rate, and it is a measure of an investment's average past performance over a long period of time.
- CAGR doesn't predict how an investment will perform in the future.
- CAGR has its limitations and doesn't necessarily reflect an investment's actual performance.

By their very nature, markets fluctuate constantly, making it difficult to know which investments are worth sinking your money into. While there's no way to reliably predict what's going to happen in any given market, there are some indicators that can give you an idea of what opportunities might be worth exploring.

Compounded annual growth rate (CAGR) is one such measure. Here is a closer look at what CAGR is and what it means in terms of investments.

What is compound annual growth rate (CAGR)?

CAGR is a formula that calculates how the value of an investment has changed over the course of a specific time period, assuming all earnings have been reinvested and no deductions have been made. This calculation allows investors to look at how much an investment has gained or lost over one or more years as a way to determine overall performance. It's a useful tool for comparing multiple investments to see what might be worth buying into, whether it's securities, property, business, or anything else of value.

How CAGR works

CAGR is calculated by looking at the initial and final values of an asset over a period of time in order to evaluate performance or growth in value. This formula is relatively simple and assumes that any value earned or revenue — through interest or dividends in the

case of financial securities — has been reinvested and compounded into the investment.

"The CAGR measure can be used in any industry," explains Daniel Garza, Chartered Financial Analyst and Senior Research Analyst with Intercontinental Wealth Advisors. "However, it can be used in the investment world to complement other widely used measures, such as time-weighted return. This is because some assets are not publicly traded and it's harder to know their value at a specific time every month/year to evaluate growth or rate of return."

Garza says that CAGR is useful when applied to assets that don't have publicly available data to determine performance, such as property or physical assets.

"This is because having an initial value for a physical asset and a final value for the same asset, regardless of the time frame, allows you to calculate it," he says. "There is no need to constantly know the value of this asset to get to CAGR."

CAGR formula

To calculate CAGR, use the following formula:

Compound annual growth rate (CAGR) formula

$$\text{CAGR} = \left(\frac{\text{Final value}}{\text{Starting value}} \right)^{\frac{1}{N}} - 1$$

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CAGR formula Alyssa Powell/Insider

- Divide the final value of an investment by its starting value.

- Apply the exponent of $1/N$ to that quotient. The value of N will be the timeframe you're evaluating, such as a number of years.
- Finally, subtract 1 from the value you get from applying the exponent.

Let's see how this works when you put it all together. To keep things simple, we are going to determine the CAGR for an investment that has grown from \$100 to \$108 in value over five years. Your formula would look like this when you plug in all of the values:

$$\text{CAGR} = (108/100)^{1/5} - 1 = .015511 \text{ or } 1.5511\%$$

This tells us that on average, the investment gained 1.5511% in value each year during the selected five-year period. Some years may have seen more growth and others less. But it smooths out to this rate when you look at the timeframe as a whole.

Quick tip: There are many CAGR calculators available online but you can also use Microsoft Excel. The program's XIRR function will calculate CAGR, or you can input the following formula into a spreadsheet cell: $=((V2/V1))^{(1/t)}-1$. This can save a lot of time and get you a quick calculation, taking some of the legwork out of your research.

How investors use CAGR

One of the most common reasons investors use CAGR is to compare investments. Though you're not seeing the actual gains and losses from year to year, CAGR shows you how an investment has historically performed. You can use this information to learn about one or more investments, see how they measure up to one another, and make informed decisions about where you want to put your money.

You can also use CAGR to track business performance as a result of measures a company takes, such as policy changes or new products introduced to market. It can also give you an idea of a business's strengths and weaknesses. For example, a CAGR that shows a steady decline over a number of years might indicate that internal or external issues are impacting profitability and the business is struggling to overcome them.

Disadvantages of CAGR

- CAGR doesn't tell you anything about an investment's risk. It's simply a measure of past performance. It doesn't account for varying degrees of risk that all investments are vulnerable to. If you want to determine the risk-return reward of an investment, you can use other calculations, such as Sharpe's Ratio and Treynor's Ratios, both of which adjust for risks that CAGR doesn't.
- CAGR is a "smoothed" value, meaning it doesn't show the history of highs and lows an investment has seen. Growth is assumed to be constant throughout the given timeline, even though that's not necessarily the case.
- CAGR can't predict how an investment will perform in the future. You can look at past performance and make a guess as to whether or not an investment is likely to continue that pattern of growth. But it is in no way a guarantee, no matter how steady growth has been in the past. In fact, Garza says the shorter the time frame used in your analysis, the less likely it will be that the expected CAGR performance will be repeated.
- Representation of data can be limited when you're talking about CAGR because you're only looking at performance during a specific time frame. There can be a lack of context that skews the interpretation of CAGR. For example, if you're looking at a stock that was hit hard during a recession and experienced rapid growth in the years recovering from a significant loss, the CAGR is going to seem overly high. That rate of increase will most likely slow as the company levels out.

CAGR vs. internal rate of return (IRR)

CAGR is a simplified, overall look at past performance. The internal rate of return (IRR) calculation takes more factors into consideration than starting and ending values over time. It looks at inflows and outflows of cash and multiple time periods. If you have added to or taken out money from the investment, using IRR is a better measure of return rate.

The bottom line

Looking at the CAGR of an investment can be useful in evaluating past performance. Because it assumes that growth is consistent from year to year within the evaluation period, it may not accurately reflect the volatility an investment experiences. It's a smoothed average that doesn't tell the whole story but can be used to quickly compare how different investments stand up to each other.

You'll find CAGR applied to all kinds of industries and to just about anything of value. Make sure to fully understand the context of how CAGR is calculated so you can make an informed opinion about what it means for your goals.

And remember that while this average uses data based on events that have already taken place, it is not necessarily an accurate predictor of how an investment will perform moving forward. View it as one of many data points in your larger research about opportunities you're interested in investing in.

Analysis :

Among the most important indicators that are usually used are those related to the level of growth, such as growth in profits, number of customers, growth in market share.....etc.

How can we measure growth rates from year to year, so two things must be alerted: The first is the growth rate, which is the percentage of growth, not the growth rate. The rate is not multiplied by percent, and this is a common mistake. The second mistake is that we say growth, and this is wrong because it can grow or decrease. But we say the percentage of change, if it is positive, there will be an increase, and if it is negative, there will be a decrease

Percentage change (growth rate): it is (the value of the previous period – the value of the current period) divided by the value of the previous period in percent %

How to Calculate Growth Rate = $(\text{Present}-\text{Past})/\text{Past} * 100 =$

Growth rate (GR) is a useful indicator for several reasons, including:

1/ Ease of comparing the performance of entities of different sizes, such as the child and his father, all of whom eat and grow, but the growth rate of the child differs from the growth rate of the father.

Avoid seasonal fluctuations

We cannot compare each quarter with the previous quarter because there is seasonality, so we compare each quarter with the corresponding quarter.

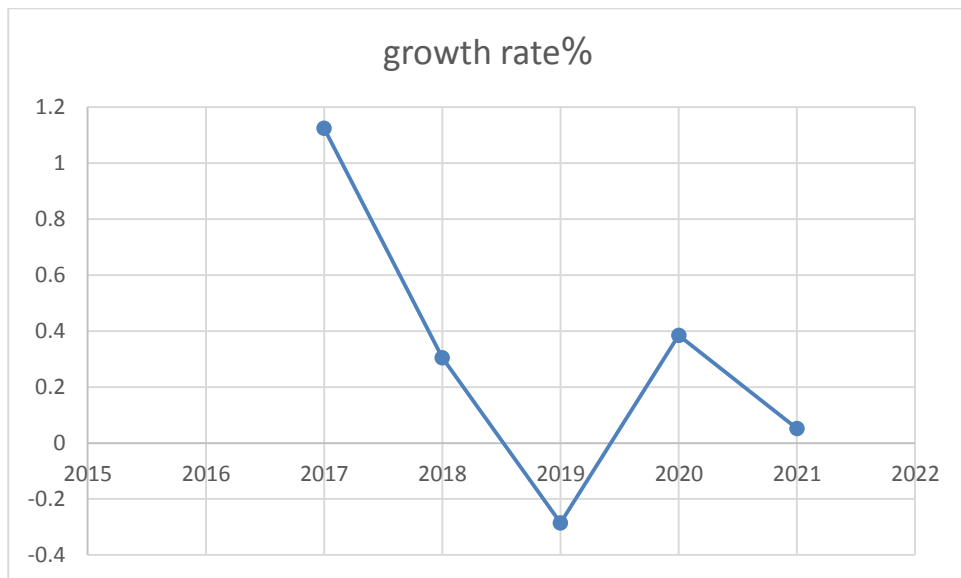
How to calculate the growth rate for more than one period:

Time series data, number of years 6 and leaps 5 leaps, 1/ We calculate the growth rate for every two years in a row, the growth rate is uneven and the leaps are uneven, we multiply the growth rate * the previous value gives us the amount of increase that occurred and we add it to the previous value to give us the next value

Or we multiply the previous value $\times (1 + \text{growth rate}) =$ it gives us the next value directly

There are two methods for calculating these percentages. They are estimated percentages (generally summed up in one number to facilitate the calculation).

The Kingdom's exports to the United States of America		
growth rate%	Value (in riyals)	year
	4991262	2016
1.123622	10599552	2017
0.30472	13829452	2018
-0.2857	9878403	2019
0.384656	13678187	2020
0.051512	14382775	2021



From the above figure, we notice that the growth rate increased in 2017 by 1.12% and decreased in 2019 by -0.28%. We note that the value of exports in 2016 was 4,991,262, and it grew to 14,382,775 in 2019, with different rates in the form of uneven jumps and different growth rates.

There are two other ways to calculate these ratios, not the real ratios, but the simpler estimated ratios (we generally say the growth rate was like this, we summarize it in one number) that is a fixed amount:

If we want to estimate the current year = the previous year + 1878302
 2/ The second case: the amount of constant annual growth: not the constant growth rate, how is it calculated: the amount of constant growth we take the first period as a previous period and the last as the current period and calculate the constant growth rate = (the last period – the first period) / the first period * 100, the total percentage Growth for 6 years 5 periods (jumps) =

- Total growth rate (change rate from 2016 to 2021) = $(14382775 - 4991262) / 4991262 * 100 = 188.2\%$

- Average annual growth = $188.2 / 5 = 37\%$.

- Average annual growth rate = $4991262 * 0.37 = 1878302$
- If I want to predict 2022 = $4991262 + 6(1878302) = 4991262 + 11269814 = 16261074$

Average annual growth rate	Value (in riyals)	year
	4991262	2016
١٨٧٨٣.٢	10599552	2017
١٨٧٨٣.٢	13829452	2018
١٨٧٨٣.٢	9878403	2019
١٨٧٨٣.٢	13678187	2020
١٨٧٨٣.٢	14382775	2021

3/ The third case: we assume that there is a fixed rate of change from year to year and not an amount of change, so what is the percentage that if we put it and increase it, but one year we reach the last year = 14382775

This ratio is called the Compound Annual Growth Rate (GAGR):
 Compound annual growth rate = (value of the last period/first period) raised 1/number of periods)-1 =
 $(1 - (\text{final}/\text{Start})^{1/y}) * 100$

Compound annual growth rate : $(1 - (\text{final}/\text{Start})^{1/y}) * 100$:

We need 3 things: 1/ the value of the first period 2/ the value of the last period 3/ the number of periods

the number of periods (y)	the value of the last period	the value of the first period
5	14382775	4991262

$= (14382775/4991262)^{1/6} * 100 = 24\% = 0.24 =$ The amount of change increases each year, but the rate of change is constant

growth rate%	Value (in riyals)	year
	4991262	2016
0.24	10599552	2017
0.24	13829452	2018
0.24	9878403	2019
0.24	13678187	2020
0.24	14382775	2021

Other way to Calculate CAGR in Excel by using function =RRI(A7;E2;E7) (<https://www.excel-easy.com/examples/cagr.html>)

There's no CAGR function in Excel. However, simply use the RRI function in Excel to calculate the compound annual growth rate (CAGR) of an investment over a period of years.

5. The RRI function below calculates the CAGR of an investment. The answer is 0.24

Note: the RRI function has three arguments (number of years = 5, start = 100, end = 147).

2. The CAGR measures the growth of an investment as if it had grown at a steady rate on an annually compounded basis. We can check this.
 $A1 * 1.24 * 1.24 * 1.24 * 1.24 * 1.24 = 14382775$

which is the same as: $A * 1.24^5 = 14382775$

Note: again, number of years or n = 5, start = 4991262, end = 14382775, CAGR = 24%.

3. Knowing this, we can easily create a CAGR formula that calculates the compound annual growth rate of an investment in Excel.

$A2 = A1 * (1 + CAGR)^n$

$end = start * (1 + CAGR)^n$

$end/start = (1 + CAGR)^n$

$(end/start)^{1/n} = (1 + CAGR)$

$CAGR = (end/start)^{1/n} - 1$

4. The CAGR formula below does the trick. $=(B7/B2)^{(1/A7)}-1$

Note: in other words, to calculate the CAGR of an investment in Excel, divide the value of the investment at the end by the value of the investment at the start. Next, raise this result to the power of 1 divided by the number of years. Finally, subtract 1 from this result.

We can predict the value of the end of 2021 = $4991262(1.24)^5=14632508.77$

Research hypotheses: We say that the rate of change in the value of exports is positive (there is an increase).

Statistical decision-making: Since the value of the compound annual growth rate is positive (0.24), we reject the null hypothesis and accept the alternative hypothesis.

Value (in riyals)	Year
4,991,262	2016
10,599,552	2017
13,829,452	2018
9,878,403	2019
13,678,187	2020
14,382,775	2021
Value	compound growth rate
24%	

188.2%	Percentage change from 2016 to 2021
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5.2%	Percentage change over the last two years
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24%	cumulative growth rate
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Results

1/ growth rate increased in 2017 by 1.12% and decreased in 2019 by - 0.28%. We note that the value of exports in 2016 was 4,991,262, and it grew to 14,382,775 in 2019, with different rates in the form of uneven jumps and different growth rates.

2/ If we want to estimate the current year = the previous year + 1878302

3/ Average annual growth = $188.2/5=37\%$.

3/ Average annual growth rate = $4991262*0.37=1878302$

4/ If I want to predict 2022 = $4991262+6(1878302+=4991262+11269814=16261074$

5/ Compound annual growth rate= $(14382775/4991262)^{1/6}*100 =24\% = 0.24 =$ The amount of change increases each year, but the rate of change is constant

Notice : The Value Compound annual growth rate= 0.24 (Positive Value) That Means Increased exports

6/ We can predict the value of the end of 2021 = $4991262(1.24)^5=14632508.77$

Recommendation :

1/ Using the annual growth rate of exports palm from the Kingdom to the Other Countries

2/ Increasing palm exports from the Kingdom to the United States of America to raise the value of the annual growth rate

3/ Conducting more similar studies to develop palm exports from the Kingdom of Saudi Arabia to various countries of the world

References :

- 1/ Hacking Growth: How Today's Fastest-Growing Companies Drive Breakout Success Paperback – 27 April 2017
- 2/ Compound Annual Growth Rate Second Edition Paperback – June 18, 2022 by Gerardus Blokdyk (Author)
- 3/ The HOOF Approach and Compound Annual Growth Rate , SAGE Publications, Incorporated, 2021 , Stephen Ko , ISBN 1071853120, 9781071853122
- 4/ Compound Annual Growth Rate (CAGR): Overview & Calculation <https://www.freshbooks.com/en-au/hub/other/compound-annual-growth-rate>
- 5/ Compound Annual Growth Rate 29 Success Secrets - 29 Most Asked Questions On Compound Annual Growth Rate - What You Need To Know <https://www.goodreads.com/>
- 6/ CAGR of e-book and print book revenue worldwide 2010-2020 Published by [Amy Watson](#) , Oct 14, 2022 .