

Newly Established Israeli High-Tech Companies: Methodology

OVERVIEW

In its upcoming July 2022 Tech Review periodical report, IVC will begin to include an estimation of newly established Israeli Start-Up companies. Uncovering this pattern is crucial for a better understanding of the Israeli Tech ecosystem in general and for painting a clearer picture about future trends in funding or liquidation of companies in particular.

For more than two decades, IVC has been collecting data points about new Israeli Tech companies. While the methodology and tools used to characterize this population has changed dramatically, the challenges remain the same: How to correctly uncover the number of new companies in a universe where almost everyone can have a technology-based “side gig”, which might (but chances are it won’t) turn into a real company one day?

The simple answer is to try and spot this “side gig” when it starts conducting business like a “real company” and develops the same behavioral patterns. That is when it begins to look for employees/investors/clients/strategic alliances/service providers, and draws attention through marketing/PR activity, or stands out in a technology exhibition hall, etc.

These sorts of behavioral preferences can be recognized with the hands-on dedicated work of information-specialists who follow media channels, company websites, tech exhibitions, social networks content, blog posts and many more information channels. When new information is uncovered, either by a specialist or an online automatic tracker, the information team approaches the company or a stockholder in it for validation.

While those methods might offer a concrete picture about the current situation, they serve as a lagging indicator for the full picture of the market participants. When IVC’s Information team spots a new company in a media article or tech exhibition, these companies are already running for some time and probably have several established quarters behind them. The real challenge then is how to draw a picture of the market activity in real time?

In this Methodology, we explain IVC’s approach to this important issue. As always, we try to be as transparent and open as possible. If something is not clear enough, please reach out to us at info@ivc-online.com

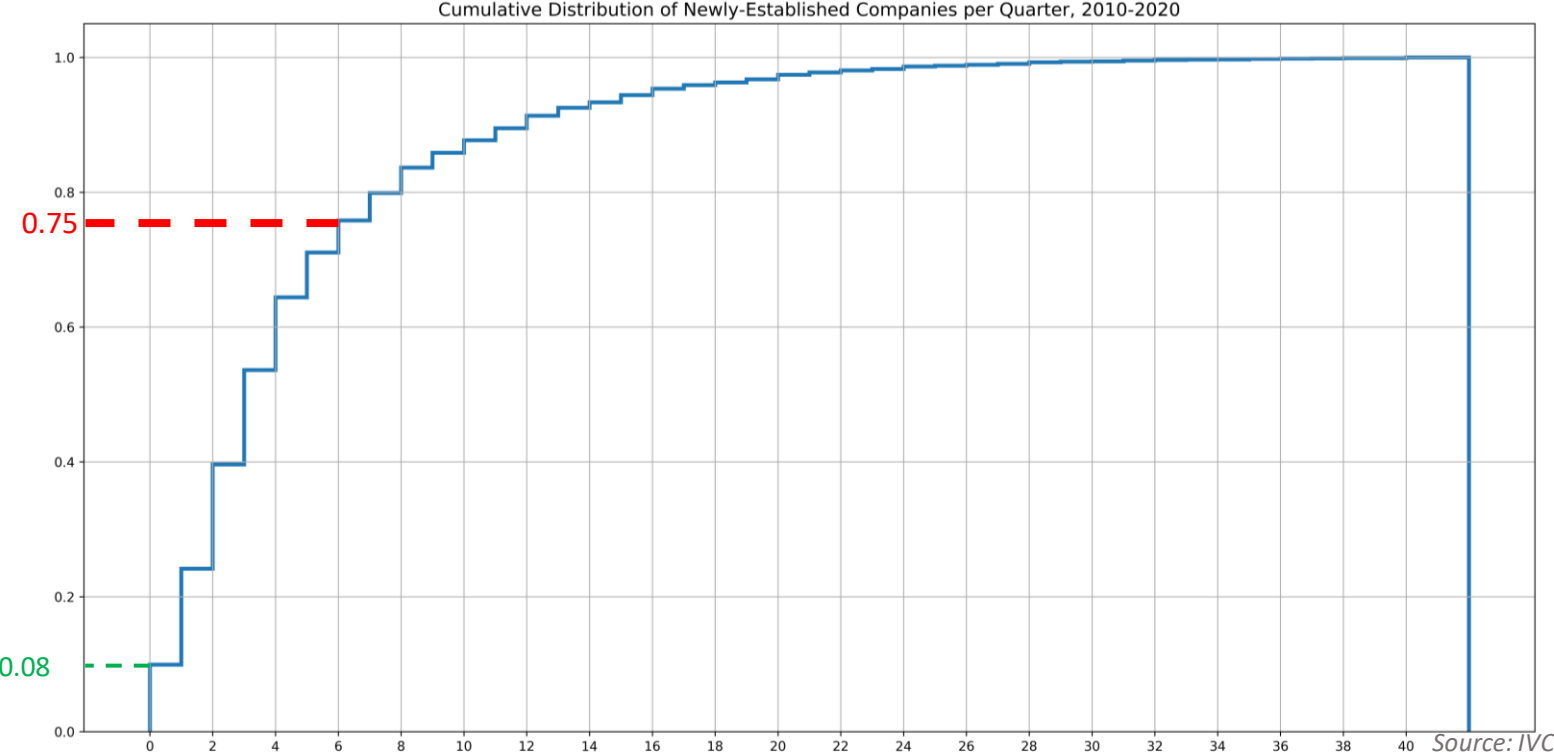
NEW COMPANY CUMULATIVE INFORMATION OVER QUARTERS

With the above-described dynamics in mind, it's clear that to assess the absolute number of companies for each period (e.g., quarter), we need to look at several more quarters.

The new company cumulative information graph plotted here, based on IVC's information gathering over the course of eleven years, from 2010 to 2020, suggests that, to discover the final number of new companies for a period takes on average 28 to 42 quarters.

Most of the information about the new population of companies is available after 6 quarters (see the dotted red line) after which, on average 75% of the companies are already known. From this point forward, the effect of added information wanes.

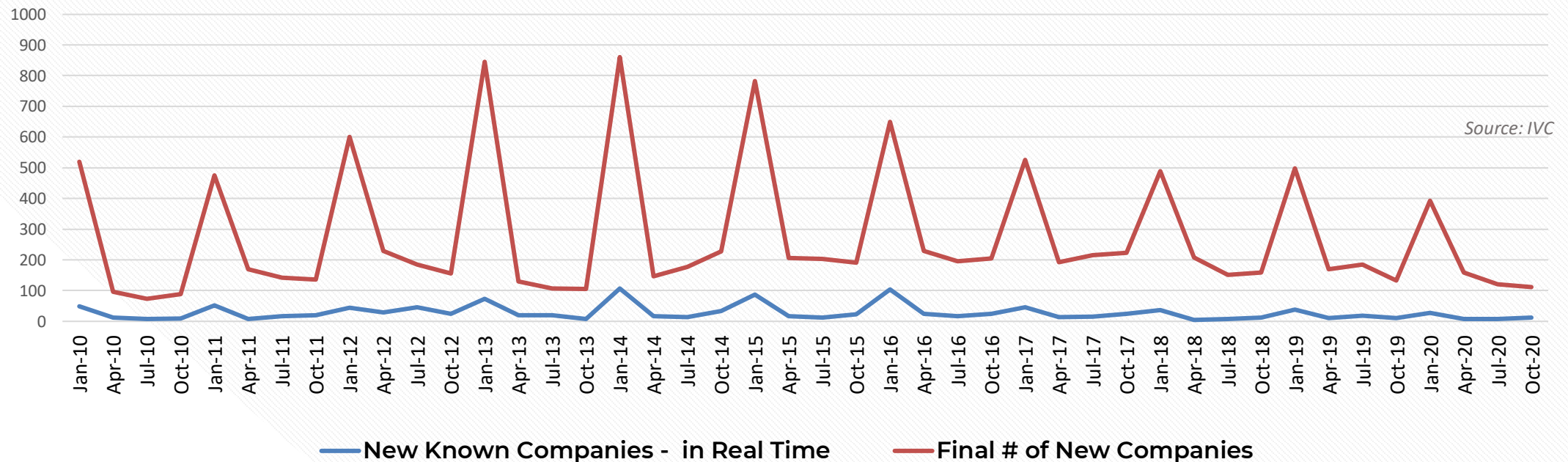
In other words, within the specific quarter a company is established, just 8% of the final number of companies established is known.



QUARTERLY # OF NEW COMPANIES

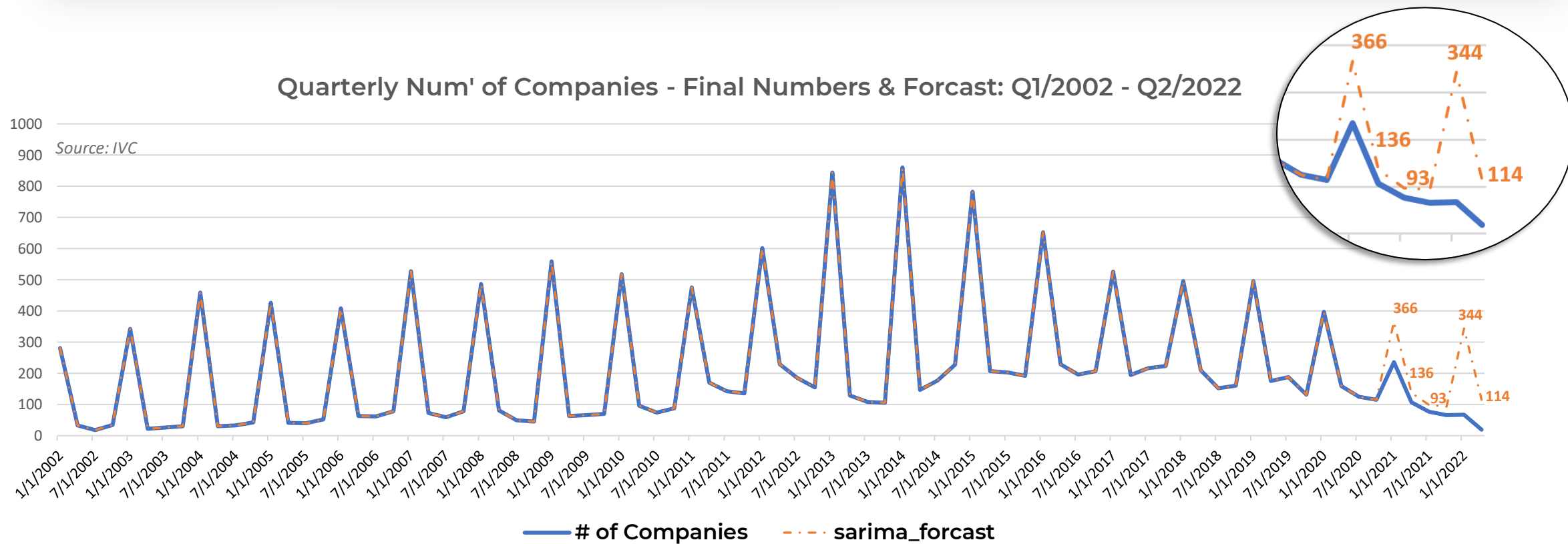
The graph shows that the trend clearly fluctuates over the quarters in a seasonal pattern. Due to the unique specification of the industry, information gathering is biased toward the 1st quarter of each year. The reason for this seasonality is mainly technical: some newly established companies cannot or will not give the exact date (day/month) they started but only the year (i.e., “we started in the first months of 2020”). Accordingly, the information team tags a company’s establishment date as 01/01/YYYY.

Quarter # Of New Companies: Final numbers VS. Known in Real Time



QUARTERLY ESTIMATION OF NEW COMPANIES, Q1/2021–Q2/2022

The unique dynamics of this universe, as described above, require 6 quarters before the "real" number of companies in a quarter can be used for learning purposes and be used for future predictions. With the seasonality effect so intense, we used the SARIMA model (see Appendix) to create an adjusted forecast for the last 6 quarters: Q1/2021– Q2/2022. The forecast for Q2/2022, as presented in the lower right corner of the graph, estimates that around 114 new companies were established in the last quarter.



TRENDS & SEASONALITY IN NEW COMPANIES ESTABLISHED DATA – APPENDIX

A statistical model wherein values change over time is called a “time series”. When data points from a time series are not highly correlated with lagged records — $Y(t) / Y(t-1)$ — and not dependent on them, and the behavior of the data remains constant over time (stationarity), we can assume that the changes in the data are related to other variables and not to the passage of time.

The first sign of a pattern that is influenced by time-related behavior is the visual of the data points. Constant fluctuations with a recurring pattern of peaks and troughs (and of course a time period in the Axis) are a good sign to check the statistical properties of the series.

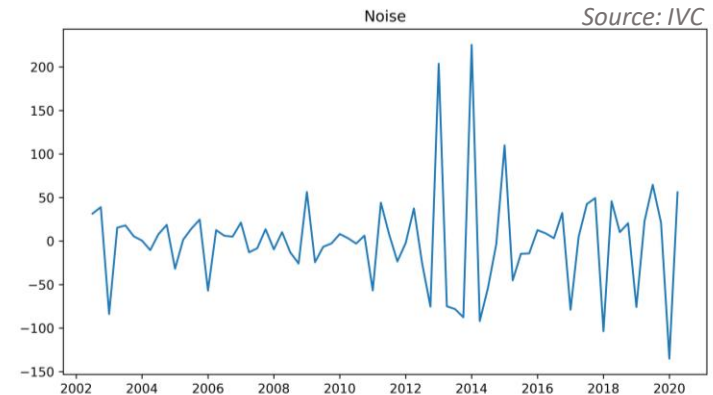
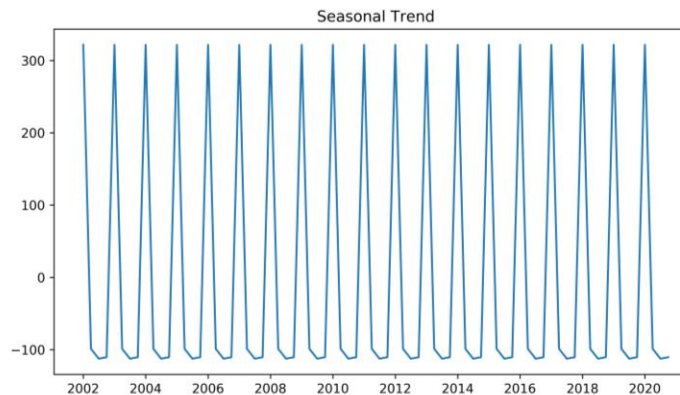
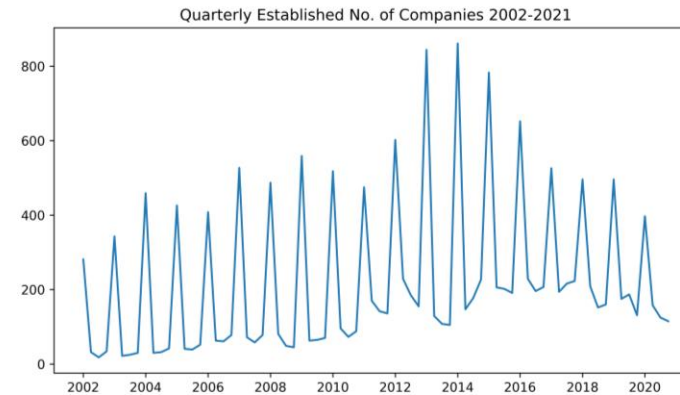
At least theoretically, the early-stage companies' universe is easily influenced by time-related behaviors, like macro-economic dynamics, availability of resources (capital/employees, etc.), new use case for technologies, and hype cycles. As such, it is not surprising that time series adjustments are a necessity in finding a reliable model. The data points of the newly established companies (see slides 4 and 5) appear highly influenced by a seasonal trend.

TRENDS & SEASONALITY IN NEW COMPANIES ESTABLISHED DATA – CONT.

A time series has three components: seasonality (a regular trend, related to a calendar); trend (long term direction of the data); and remainder, or noise (irregular, short-term fluctuations). Decomposition of quarterly data from 2002–2020 shows that all three components are present (See the plots).

One of the most popular statistical tests for stationarity level is the Augmented Dickey-Fuller test (ADF) which returns relatively large P – Value so we assume the time series is non-stationary and needs to be adjusted.

Moreover, checking the correlation graph (ACF Plot) of records with lagged values supports the need for adjustment every 4th quarter (Q1 each year), due to the technical issues involved in the data collection process.

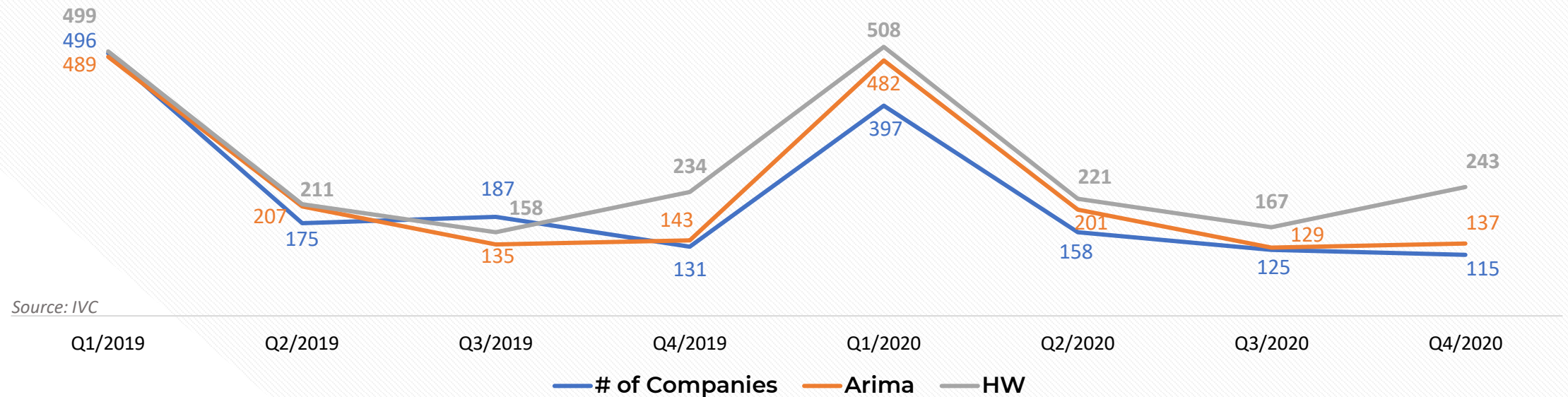


Source: IVC

ADJUSTMENT TECHNIQUES: SARIMA VS. HOLT-WINTERS

Two of the most popular statistical models used for adjusting time series with strong seasonality patterns are SARIMA (Seasonal [ARIMA](#) model) and [Holt-Winters](#) exponential smoothing (HW). In order to find the most suitable model, we tested the forecast accuracy of each by comparing the forecast results to real data of 8 quarters over 2019–2020. Using [MAPE](#) error (Mean Absolute Percentage Error) to measure the accuracy in percentage points, the SARIMA model was found to be significantly better (error of 16% vs. 41%). In summing up the 8 quarters to two years, to minimize the variation, the SARIMA model gave an annual error level of 10% vs. 27% for HW.

of Companies Forecast per Quarter: Q1/2019 – Q4/2020





THANK YOU

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