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Is Amazon exploiting its dominant market position at Corona times? Evidence from office supplies and Stationery in Germany

Abstract

The purpose of the paper is to prove that Amazon exploited its dominant market position at pandemic times in 2020 and 2021 in Germany to increase prices and returns. In the period 2019 to 2021, the purchase and sales prices, as well as Amazon's buy box rate of approximately 10,000 items in the office and stationery category were recorded and evaluated. It was found that the sales prices increased by approximately 4% more during the pandemic period than the purchase prices during the same period. The federal government's temporary VAT reduction from 19% to 16% in the second half of 2020 was passed on to customers by Amazon. In addition, VAT increases in January 2021 were not exploited for a hidden price increase by Amazon. Rather, the observed price increases of 8% to 15% in 2021 is due to the increase in Amazon's purchase prices and the VAT adjustment in January 2021. The Amazon Buy Box ratio fell from an average of 75% to as low as 56.7% during the first government lockdown due to a demand shock, but was recovered by Amazon in subsequent months through price discounts and the sacrifice of its own profit margin of over 5% on the previous year. On average for the year, Amazon Buy Box ratios remained almost the same as in the previous year and the second pandemic year. The events of the first lockdown are compared with further restrictions in the pandemic, whereby a drop in the Buy Box quota could not be determined again.

Keywords

Inflation, online price index, Amazon, online trade, purchase price, buy box

JEL classification

E30, E31, O12

Introduction

What´s happened in Germany during Covid-19

With the onset of the Corona pandemic in early 2020, drastic government requirements and restrictions were implemented to contain the virus in Germany (Räker et all, 2021). Among other things, curfews were imposed, brick-and-mortar stores were closed, students and parents were forced to home-school and work from home, and the VAT rate was temporarily reduced to stimulate the economy. While brick-and-mortar retail was propped up and saved with stop-gap aid, online retail experienced an explosion in demand. By 2021, one in seven euros in retail was already spent online, representing growth on 2019 of over 43% (Online Monitor, 2021). Above all, however, the tech and online giant Amazon benefited from the state-imposed shop closures of stationary retail. In 2020 and 2021 alone, Amazon Germany increased net sales to €32.6 billion. In the year before the Corona pandemic, it was still 19.9 billion euros (amazon.com, INC, 2021). Online retail experienced a veritable demand shock during the lockdowns. Online retail sales skyrocketed, led by the industry leader Amazon. Anyone who did not have an Amazon account before then had to create one now at the latest.

Demand determines supply. If more and more people demand goods online, the supply or the offer price will also increase. Since today's online market is only limited by a few large companies, such as Amazon, Otto, Zalando and Ebay, the increasing demand was only served by a few online shops. This created a strong channelling of demand to a few providers, which suggests a price increase due to a dominant market position.

Amazon, how it works

Amazon has set out to sell everything except guns and live animals (Jeff Bezos, 2015). Amazon is an online shop and marketplace that sells virtually everything in various product categories. To ensure low prices, Amazon scans the entire online market using its own scraping systems to look for the best deals on an item. Once the best price or offer has been found in another online shop, this offer is posted or undercut on its own website, with the aim of always offering the customer the best price (Cavallo, 2018). Thus, prices in online retail are generally very volatile. The retail giant Amazon acts as both a seller and a marketplace on its website. As a seller, Amazon mostly buys the goods directly from the manufacturer in order to resell them to the consumer on its own behalf and account on the website. However, Amazon also functions as a marketplace where other online sellers can offer goods. Other sellers have the opportunity to sell products on Amazon that Amazon itself also sells. Amazon has no direct

influence on the sales prices of the other marketplace participants. Each seller of goods must determine his own selling price. Finally, there is one offer from Amazon directly and many more from other sellers. The consumer is free to choose from whom he buys a product. However, Amazon already places the best offer for the consumer in the Buy Box. The Buy Box is a synonym for the best offer in terms of price and shipping costs, which Amazon connects to the buy button of the item. With this principle, Amazon creates a competition on its own website. With the battle of all sellers for the Buy Box, the best possible offer from price and shipping costs is determined for the consumer.

1 Research Question

The aim of this paper is to find out how office and stationery prices on Amazon.co.uk have changed in times of pandemic from 2019 to 2021 and how the Amazon Buy Box ratio has changed during this period.

A key question arises for this research: is Amazon exploiting its dominant market position in times of government-imposed shop closures of brick-and-mortar retailers? Further, subordinate research questions arise that will be answered in this paper: How did Amazon consumer prices in the office and stationery category change between January 2019 and December 2021 due to government restrictions and requirements? Did Amazon fully pass on the VAT reduction to the customer or was there a hidden price increase, if applicable? Did Amazon use the VAT increase at the end of 2021 to raise consumer prices by more than the VAT rate? What Buy Box behaviour can be demonstrated?

2 Research hypothesis

The shop closures of brick-and-mortar retailers shifted shopper demand to online retail in one fell swoop, resulting in a demand shock. The hypothesis of the paper is that Amazon exploited its market position during the Corona pandemic, especially in 2020 and 2021, to maximise market share and profits. It is suspected that Amazon raised prices and occupied the buy box more than in times before the pandemic by suspending or adjusting some of the automatic price adjustment. Amazon's share price alone suggests this. It climbed from USD 93.75 in January 2020 to USD 166.72 in December 2021 (google.com/finance, 2022).

3 Data and Methods

Using a modern web scraping method, the daily prices and the buy box situation could be recorded on www.amazon.de. The daily monitoring of prices makes it possible to find out

what direct and indirect influence the government restrictions within the Corona Pandemic had on prices and the Buy Box in 2020 and 2021. The changes in the VAT rate in the second half of 2020 are more likely to have a direct impact on price. Whereas the lockdowns and shop closures had more of an indirect impact on sales prices, purchase prices and the Amazon Buy Box. In addition, by monitoring both price levels, it is possible to find out how Amazon's margin changed during the monitoring period.

This study has the following data on a daily basis from 9,977 items from 17 different brands in the office and stationery sector (pens, paper, staplers, scissors, writing pads, etc.) in the period 01.01.2019 to 31.12.2021 (appendix, table 1):

- Amazon Purchase Price (AZN PP)
- Amazon Gross Sales Price incl. VAT (AMZ RP)
- Amazon Net Profit Margin (Net PPM)
- Amazon Buy Box Quote per Month (AMZBB)

The purchase price of an item from Amazon can only be changed by a supplier. This is usually negotiated with Amazon and is almost stable for one year. It describes the actual cost price for Amazon of a product. Downstream remuneration or discounts are not included. Amazon and suppliers usually negotiate downstream purchasing and invoicing conditions once a year. It must be assumed that downstream conditions have changed during the data records, which also has a direct influence on Amazon's profitability. The sales and purchase price are therefore not the only variables influencing Amazon's net profitability (Net-PPM). The Amazon Net Profit Margin (Net-PPM) is an index figure provided by Amazon to the supplier on a weekly basis. It is intended to show how profitable an item is for Amazon when Amazon itself has taken over the Buy Box. The Amazon gross selling price including VAT is the price at which Amazon offers a product on the marketplace. The Amazon market price does not necessarily have to be the price with which Amazon wins the Buy Box over other sellers. The Amazon price therefore does not necessarily represent the price at which the customer purchases an item. Therefore, the Amazon buy box ratio is an important indicator that should show how much Amazon itself occupies the buy box.

The methodological approach for the study is as follows. In order to minimise errors in the raw data or measurement errors, the data was trimmed. If prices deviate more than 80% downwards or 400% upwards from the previous daily price, this figure is not used in the calculation. Guidance is provided by a published study by Hansen (2020), who has

already undertaken a study of online prices to investigate the dynamic pricing of online shops. An item must have at least ten data points per month to be considered in the study. It is possible that Amazon did not offer individual items for certain periods of time, resulting in missing sales price data (RP). The same logic is used for the purchase price data (PP) to ensure data quality. Then the daily prices are aggregated to an arthritic average price per month. The monthly Amazon Buy Box quota is calculated using the quotient of the number of days Amazon itself occupied the Buy Box and the number of days in a month. The data series starts with January 2019 compared to January 2020, at which point there are only 1,812 valid data points out of the total number of items to 6,649 invalid ones. This ratio shifts to 5,117 valid and 3,096 invalid data points by December 2021 compared to December 2020. Only the AZN Net PPM is only available for 2020 and 2021, so the change could only be measured in 2021. In the end, however, the Amazon Net-PPM is only intended to confirm or invalidate the theory put forward. The sample is checked to see to what extent it is representative. It is assumed that the basic quantity of products in the office and stationery category is not determined and cannot be narrowed down. Thus, the simplified formula for calculating the sample size can be used. To ensure that the sample contains the true value even in the worst case, the sample size is forced to its maximum with $\pi = 0.5$. The π-value can be between 0% and 100% and is usually not known in advance of a sample investigation. With $\pi = 0.5$, it is ensured that the equation for determining the sample with $\pi(1 - \pi)$ obtains its maximum. If $\pi = 0$ and $\pi = 1$, the sample would be $n = 0$. To ensure a high confidence level of the sample of at least 99%, $z = 2.58$ is set. The z-value was determined using the z-value table of the standard normal distribution.

Confidence level: z-value table

90% → 1,65 95% → 1,96 99% → 2,58

A margin of error (1) of maximum 3.03% is allowed with the sample size of 1.812 measurements (2). A margin of error of only 1.8% is achieved with the sample size of 5.117 measurements (3).

$$E = z * \sqrt{\frac{\pi(1-\pi)}{n}} \qquad (1)$$

n = sample size, π = proportion of the characteristic in the population, z = width of the confidence interval, E = margin of error

$$E = 2.58 * \sqrt{\frac{0{,}5(1-0.5)}{1{,}812}} = 0.0303 \text{ (with the smallest sample size, n=1,812)} \qquad (2)$$

$$E = 2.58 * \sqrt{\frac{0.5(1-0.5)}{5{,}117}} = 0.0180 \text{ (with the largest sample size, n=5,117)} \qquad (3)$$

Thus, it can be concluded that the sample of at least 1,812 items is representative at all times with a probability of 99% and a margin of error of 3.03%.

The price changes of products are measured against the respective month of the previous year. Just as with the inflation comparison, the average monthly price of the current month is compared with the same month of the previous year. If data from the previous year is not available, this item is not taken into account for the current month. This means that an item can only be considered in the study if a reliable value of the current month and the previous month is available. However, this method reduces the sample considerably.

The changes t-1 and t of the Amazon purchase prices and Amazon sales prices of overlapping products are compared. These are products that can show a valid value in both months. We calculate an index (PPI) for the purchase price changes (4) and an index (RPI) for the Amazon selling price changes (5). Then, the average of the monthly price indices is calculated to determine a price change at the category level, analogous to inflation (appendix, tables 2, 3). Thus, the inflation or inflation of the existing basket of goods is calculated based on the correspondence of the price data to the previous month. Finally, the indices are compared to test the hypothesis. The Laspeyres index formula is used for the calculations of the online price index, which is also used in the calculation of the consumer price index and the Harmonised Index of Consumer Prices in Germany (Camba-Mendez et al., 2002).

Calculation Purchase price inflation (PPI):

$$PPI = \sum_{t=0}^{t} \frac{PP_t - PP_{t-1}}{PP_{t-1}} \qquad (4)$$

t = period month, t-1 = same month, previous year, PPI = purchase price inflation, PP = purchase price

Calculation Amazon retail price inflation (RPI):

$$RPI = \sum_{t=0}^{t} \frac{RP_t - RP_{t-1}}{RP_{t-1}} \qquad (5)$$

t = period month, t-1 = same month, previous year, RPI = retail price inflation, RP = Amazon retail price

Calculation monthly Buy Box quota (BBQ):

$$BBQ = \frac{ADB}{DpM} \qquad (6)$$

BBQ = buy box quota, ADB = days when Amazon on buy box, DpM = days per month

The monthly Buy Box quota per item is calculated from the number of days on which Amazon itself was in the Buy Box (ADB) in relation to the number of days in a month (6).

The total Buy Box quota per month is calculated from the average of all Buy Box quotas per article and month.

Calculation Change Amazon pure profit margin (CnetPPM):

$$CnetPPM = netPPM_t - netPPM_{t-1} \qquad (7)$$

t = period month, t-1 = same month, previous year, CnetPPM = change Amazon Net-PPM to previous year, netPPM = pure profit margin by Amazon

The change in Amazon's net profit margin is calculated with a simple subtraction of the net PPM from the current year and the net PPM from the previous year (7). The change in net profit margin per month will be used at the end of the study to strengthen or refute the findings. margin per month will be used at the end of the study to strengthen or refute the findings (appendix, table 4).

4 Results

The examination of the results only partially confirms the hypothesis, but nevertheless allows for very interesting findings. Amazon's annual average buy box rate is around 75% (appendix, figure 1). Only in March and April 2020 does the Amazon buy box rate collapse to 56.73%, leading to a real buy box crash. This is due to the first lockdown in the course of fighting the pandemic, starting on 22 March 2020. The closure of brick-and-mortar retail led to a demand shock in online retail. Amazon, which turns over nearly every second euro in online retail (Online Monitor, 2021), was now sold out of many items and had to let other sellers in the marketplace take the buy box. Amazon first had to get new goods again, which, according to experience, takes ten days. Already in May '20 Amazon reached a Buy Box value of 75% again. In the following months Amazon seems to make up for the lost Buy Box shares. By December '20 Amazon significantly increases its own Buy Box quota with an average of 79.97% in the second half of the year. The Buy Box ratio reaches its peak with over 84% in August'20. At the end of 2021 Amazon again reached an average annual value of 75.83%. It is also interesting that the event of the buy box crash was not diagnosed again for the second state lockdown in November and December 2020. Thus, it can be stated that Amazon was now better prepared for upcoming restrictions and requirements by the German government and had sufficient goods in stock.

The Buy Box analysis helps to understand the context of Amazon price changes. In the sample of up to 5,117 valid prices, the changes in Amazon purchase price increases only diverge significantly from sales price increases in the second half of 2021. While Amazon was

still lowering prices and foregoing margins in 2020, prices were significantly increased in 2021. The diagnosed price reduction from June to December 2020 correlates with Amazon's increased Buy Box share. Namely, to make up for the lost Buy Box shares, Amazon had to lower prices to win its own Buy Box on the marketplace. The price reduction on Amazon's part was not seen again in the course of the second lockdown, as Amazon now had no need to regain lost Buy Box shares (appendix, figure 2).

The government-imposed VAT cut from 19% to 16% to activate consumption from July'20 to December'20 had an additional effect on Amazon's price. At the end of the day, it can be said that Amazon passed on the 3% VAT cut to stimulate consumption to its customers. The real effect of the VAT cut on consumer prices is only 2.52%. In August'20 and September'20, the negative inflation of Amazon prices reaches its peak. Price reductions of up to 5.5% in August'20 and 7.63% in September'20 compared to the previous year are recorded. These significant price reductions correlate with Amazon Buy Box share. Amazon wants to win back lost Buy Box shares and has to lower prices to do so. The higher the Buy Box ratio, the lower the Amazon prices. In January '21 the VAT was raised again to the old rate of 19%. In the same month, Amazon sales prices jumped by 10.36% compared to the same month of the previous year. This price jump was driven by increased purchase prices, which were raised significantly by 8.5% in January. Amazon usually negotiates new prices and conditions with its suppliers for the coming year, which then become effective for invoicing at the beginning of a new year. The standard deviation of purchase price inflation of up to 52.45% indicates a high dispersion of price data in 2021. Compared to the 2020 standard deviation of 5% on average, this means that few products have been significantly increased. The VAT effect does not yet have an impact on inflation at this point. Approx. 3% Amazon increases the sales price without influence of any other measurable effect in this study. Compared to the inflation of the Federal Statistical Office in the category SEA-VPI-No.0954 stationery and drawing materials (appendix, table 5), the inflation for January'21 is only 1.7% (Destatis, 2022).

In the second half of 2021, the VAT effect of the previous year comes into play. While the effect had a negative impact on inflation and the Amazon price in the previous year, it is now responsible for a positive effect of 2.52%. The increased purchase price of 9.06% explains a further part of the calculated sales price increase on the part of Amazon, but not the entire increase of 14.03% in July 2021. The average inflation of the purchase price from July to December 2021 is 9.05%. The average inflation of the retail price is 14.40%. The VAT effect is 2.52%. This means that Amazon's prices increased by 2.83% without the influence of VAT and the purchase price increase.

Compared to the official inflation rate of the Federal Statistical Office of the 3rd Stella level (SEA-VPI-Nr.0954), the inflation of the Amazon sales price is higher. Run Amazon sales price analysis, inflation is determined to be as high as 15.89% in October 2021. The Federal Statistical Office has determined an inflation of only 4% in the same period. Recording the year-on-year change in Net PPM, which hovers around zero with the exception of April 2021, confirms the finding that Amazon must have given up margins in the previous year in an attempt to restore the Buy Box ratio. April 2021 is diagnosed as a single significant year-on-year increase in net profit margin of 5.48%, but this does not reflect a trend. The jump in the net profit margin is not due to an increased selling price and decreased buying prices in 2021. The cause of the changes therefore lies in the previous year. Amazon can logically only calculate a margin if an item has also been sold. Since Amazon was sold out of many items in March and April 2020, no profit margin could be achieved and calculated. Deviations in the AZN-Net PPM of up to 1% upwards and downwards compared to the same month of the previous year are quite common in the market. It therefore refutes the hypothesis that Amazon exploited its market position at pandemic times to maximise profits to the detriment of consumers.

Conclusion

Amazon first significantly lowered prices in the office and stationery category within the Corona pandemic in 2020 compared to the prevailing expectations in Germany and then significantly increased them in 2021. With the first lockdown imposed by the federal government and the associated blanket closure of stationary retail, online retail and Amazon in particular is experiencing a demand shock. Amazon came under pressure on its own marketplace due to an increased sell-out situation. Amazon lost significant share in Bux Box in March '20 and April '20. As a result, Amazon's selling prices rose in the same month, as goods were scarce and the battle for the Buy Box was literally suspended. Sooner or later, everyone who still had goods won the Buy Box and could sell their items. When Amazon and all other marketplace participants had stocked up again with sufficient goods in May '20, the battle for the Buy Box could start again. In order to correct the Buy Box situation, Amazon lowered prices significantly in the following months of the same year in order to win back the lost Buy Box shares. Thus, Amazon price inflation rates ranked well below the official inflation rate of the German Federal Statistical Office at the comparable Stellar level. The significant reduction in Amazon sales prices also shows that the Amazon algorithm seems to have targets that predominantly have to be achieved, even if it means giving up one's own

margins. This is particularly noticeable in the jump in profit margin in March'21 compared to the same month last year. Since the jump in profits cannot be attributed to increased sales prices or reduced purchase prices, one can assume that the profit margin in March'20 must have been very low. In this specific case, it was more important for Amazon to somehow react to the lost buy box quotas than to secure its own margins. The reduction in VAT from July'20 to December'20 had an additional effect on prices. It can be stated that Amazon passed on the VAT advantage to its customers and did not exploit its dominant market position in the first pandemic year.

A significant influence on the price increase in the second pandemic year was primarily the purchase price increase and the VAT increase from January'21. Beyond these influencing factors, a maximum price deviation between purchase and sales prices - adjusted for the VAT effect - of up to 4% in October'21 could be determined, but this does not necessarily have to be due to Amazon's dominant market position, as no significant increase in Amazon's net profit margin could be determined in the same period. It is much more likely that the price increase is due to higher energy and logistics costs, which have increased sharply in times of the pandemic. A clear advantage for Amazon based on the available data cannot be ascertained in the second pandemic year either.

The described effect from the restrictions and limitations on public life from the first lockdown could not be determined again for the second lockdown in November and December 2020. Amazon learned from the first lockdown and was prepared for the next wave of demand. Even the international logistics shock when the cargo ship Evergiven blocked the Suez Canal for several days in March 2021 had no measurable impact on prices.

While the inflation of Amazon sales prices in 2020 is still well below the inflation of the German Federal Statistical Office and in 2021 well above it, and considering that every fifth euro (excluding food) is already spent online, the calculated inflation of the Amazon sales price should rather go hand in hand with the official inflation. Other research can follow this theory.

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Appendix

Table no. 1: Data collection scheme: daily Amazon purchase price, daily Amazon retail price, daily Amazon buy box and daily Amazon net pure margin per week

	01.01.2019				...	31.12.2021			
	AZN PP	AZN RP	AZN BB	Net-PPM		AZN PP	AZN RP	AZN BB	Net-PPM
Product 0001	4,67 €	5,78 €	yes	53%		4,88 €	6,12 €	yes	45%
Product 0002	23,56 €	32,99 €	yes	19%		22,50 €	29,34 €	no	12%
Product 0003	12,87 €	17,50 €	no	32%		13,45 €	19,99 €	yes	26%
Product 9977	8,65 €	10,67 €	yes	41%		9,34 €	12,56 €	no	41%

Source: own research

Table no. 2: Amazon purchase price inflation with valid sample size, median, standard deviation, range and percentiles 25, 50 and 75.

AZN-PP Inflation	valid	missing	Inflation AZN-PP	Median	standard deviation	Range	Minimum	Maximum	Perzentille 25	Perzentille 50	Perzentille 75
Jan 20	1969,00	6237,00	-0,78	0,00	6,62	120,92	-57,15	63,77	-1,43	0,00	0,62
Feb 20	3395,00	4811,00	-0,44	0,00	4,01	194,93	-59,36	135,57	0,00	0,00	0,00
Mrz 20	3401,00	4805,00	-0,16	0,00	4,25	215,20	-59,36	155,84	0,00	0,00	0,00
Apr 20	3506,00	4700,00	0,12	0,00	4,11	231,90	-59,36	172,54	0,00	0,00	0,66
Mai 20	4011,00	4195,00	0,32	0,00	3,61	247,38	-74,84	172,54	0,00	0,00	0,00
Jun 20	4045,00	4161,00	0,65	0,00	3,74	224,18	-51,64	172,54	0,00	0,00	1,41
Jul 20	4049,00	4157,00	0,76	0,00	3,40	222,54	-50,00	172,54	0,00	0,00	1,41
Aug 20	4216,00	3990,00	0,75	0,00	3,19	200,45	-27,91	172,54	0,00	0,00	1,39
Sep 20	4243,00	3963,00	0,77	0,00	3,14	198,35	-25,81	172,54	0,00	0,00	1,39
Okt 20	4263,00	3943,00	0,77	0,00	3,14	198,35	-25,81	172,54	0,00	0,00	1,39
Nov 20	4326,00	3880,00	0,76	0,00	3,11	198,35	-25,81	172,54	0,00	0,00	1,39
Dez 20	4401,00	3805,00	0,70	0,00	3,48	248,10	-75,56	172,54	0,00	0,00	1,36
Jan 21	4725,00	3481,00	8,50	0,09	52,75	478,51	-79,83	398,68	-1,90	0,09	2,66
Feb 21	3400,00	4806,00	8,63	0,00	52,45	476,54	-79,75	396,73	0,00	0,00	0,00
Mrz 21	4694,00	3512,00	9,49	0,00	51,71	474,60	-79,62	394,98	0,00	0,00	2,17
Apr 21	4744,00	3462,00	9,32	0,00	51,78	473,81	-79,74	394,07	0,00	0,00	1,71
Mai 21	4771,00	3435,00	9,25	0,00	51,67	473,81	-79,74	394,07	0,00	0,00	1,69
Jun 21	4784,00	3422,00	9,00	0,00	51,68	473,81	-79,74	394,07	0,00	0,00	1,34
Jul 21	4801,00	3405,00	9,06	0,00	52,05	473,81	-79,74	394,07	0,00	0,00	1,34
Aug 21	4921,00	3285,00	8,88	0,00	51,41	473,81	-79,74	394,07	0,00	0,00	1,35
Sep 21	4934,00	3272,00	9,11	0,00	52,16	473,69	-79,62	394,07	0,00	0,00	1,35
Okt 21	4977,00	3229,00	9,17	0,00	51,92	473,81	-79,74	394,07	0,00	0,00	1,57
Nov 21	5046,00	3160,00	9,12	0,00	51,81	473,81	-79,74	394,07	0,00	0,00	1,57
Dez 21	5117,00	3089,00	8,95	0,00	51,49	473,81	-79,74	394,07	0,00	0,00	1,57

Source: own research

Table no. 3: Amazon retail price Inflation with valid sample size, median, standard deviation, range and percentiles 25, 50 and 75.

AZN-RP Inflation	valid	missing	Inflation AZN-RP	Median	standard deviation	Range	Minimum	Maximum	25,00	50,00	75,00
Jan. 20	1812,00	6394,00	6,23	0,00	38,67	431,07	-79,32	351,75	-9,80	0,00	11,43
Feb. 20	2992,00	5214,00	1,76	0,00	31,25	450,99	-76,81	374,18	-12,54	0,00	8,74
Mrz. 20	3141,00	5065,00	3,50	0,00	31,44	431,07	-78,39	352,68	-10,94	0,00	10,48
Apr. 20	3038,00	5168,00	6,25	0,76	31,30	468,51	-79,97	388,55	-6,31	0,76	13,37
Mai. 20	3635,00	4571,00	2,92	0,00	32,29	436,34	-78,39	357,96	-10,40	0,00	8,83
Jun. 20	3645,00	4561,00	0,04	-0,19	31,92	427,46	-79,56	347,89	-14,26	-0,19	7,35
Jul. 20	3629,00	4577,00	-2,70	-2,90	31,65	431,74	-78,32	353,42	-17,60	-2,90	4,96
Aug. 20	3910,00	4296,00	-5,58	-5,57	33,57	463,73	-79,49	384,23	-21,87	-5,57	2,59
Sep. 20	3702,00	4504,00	-7,63	-6,77	31,84	468,74	-78,75	389,99	-23,16	-6,77	0,71
Okt. 20	3707,00	4499,00	-6,50	-5,60	31,97	407,74	-79,87	327,87	-20,70	-5,60	0,99
Nov. 20	3681,00	4525,00	-3,95	-3,16	30,29	450,06	-79,80	370,26	-14,81	-3,16	1,83
Dez. 20	3742,00	4464,00	-2,89	-2,67	31,58	448,90	-78,75	370,14	-14,68	-2,67	3,00
Jan. 21	4521,00	3685,00	10,36	0,00	59,80	477,66	-79,98	397,67	-12,30	0,00	13,93
Feb. 21	4355,00	3851,00	11,14	0,00	59,00	478,18	-79,91	398,27	-10,50	0,00	14,33
Mrz. 21	4532,00	3674,00	9,95	0,00	58,13	477,24	-79,84	397,39	-11,72	0,00	12,80
Apr. 21	4238,00	3968,00	8,11	-0,77	59,12	479,39	-79,95	399,44	-14,74	-0,77	9,30
Mai. 21	4509,00	3697,00	7,99	-0,46	58,20	471,65	-79,89	391,75	-13,15	-0,46	9,71
Jun. 21	4481,00	3725,00	9,14	-0,09	61,04	479,98	-79,98	400,00	-12,88	-0,09	10,96
Jul. 21	4443,00	3763,00	14,03	2,58	60,46	476,91	-79,89	397,02	-6,91	2,58	16,08
Aug. 21	4659,00	3547,00	15,24	3,05	58,95	474,09	-79,89	394,20	-5,51	3,05	17,62
Sep. 21	4459,00	3747,00	15,34	3,32	59,57	479,21	-79,99	399,22	-4,45	3,32	17,29
Okt. 21	4496,00	3710,00	15,89	3,60	60,28	477,04	-79,90	397,14	-4,11	3,60	16,46
Nov. 21	4600,00	3606,00	15,04	3,16	61,15	477,52	-79,77	397,75	-4,94	3,16	16,04
Dez. 21	4652,00	3554,00	10,82	2,39	58,92	478,66	-79,11	399,55	-9,58	2,39	11,83

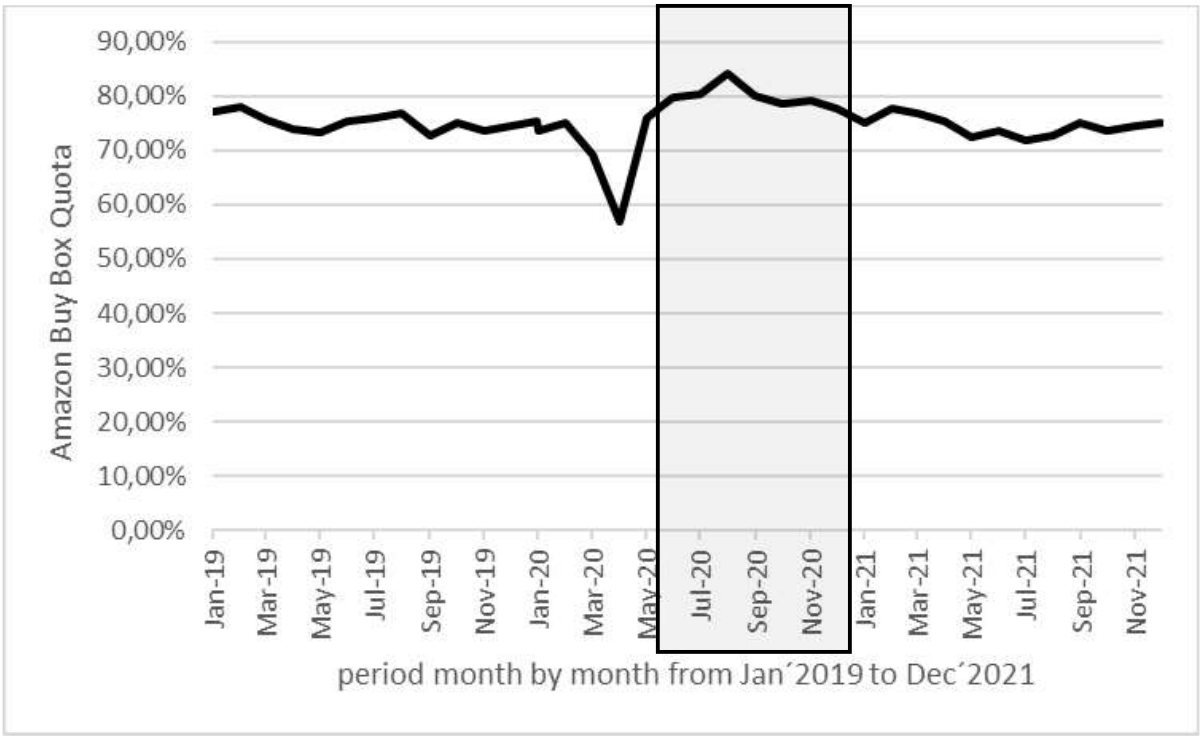
Source: own research

Table no. 4: Change AZN-Net-PPM compared to the same month of the previous year with valid sample size, median, standard deviation, range and percentiles 25, 50 and 75.

AZN-Net-PPM	valid	missing	Change AZN-Net-PPM	Median	standard deviation	Range	Minimum	Maximum	Percentile 25	Percentile 50	Percentile 75
Jan. 21	2158,00	6048,00	-0,71	0,00	23,79	316,27	-78,20	238,07	-12,91	0,00	10,21
Feb. 21	2294,00	5912,00	-0,48	0,44	22,83	170,30	-74,90	95,40	-11,09	0,44	10,41
Mrz. 21	2294,00	5912,00	0,95	0,60	22,45	184,13	-72,81	111,32	-10,19	0,60	11,75
Apr. 21	3338,00	4868,00	5,48	4,39	25,62	320,38	-79,28	241,10	-5,56	4,39	18,55
Mai. 21	3557,00	4649,00	0,20	1,17	24,43	337,94	-79,40	258,54	-10,91	1,17	12,34
Jun. 21	3509,00	4697,00	-0,10	0,64	23,95	256,90	-79,50	177,40	-11,63	0,64	12,32
Jul. 21	3531,00	4675,00	-1,25	0,00	20,54	213,44	-79,74	133,70	-10,36	0,00	8,96
Aug. 21	3874,00	4332,00	-0,79	0,23	21,50	334,11	-79,60	254,51	-10,99	0,23	9,16
Sep. 21	3846,00	4360,00	0,68	0,91	20,93	280,36	-75,45	204,91	-8,80	0,91	10,18
Okt. 21	3895,00	4311,00	0,16	0,56	21,42	294,06	-77,18	216,88	-9,34	0,56	10,03
Nov. 21	3951,00	4255,00	-0,57	0,51	21,48	325,98	-79,31	246,67	-10,63	0,51	9,35
Dez. 21	3929,00	4277,00	-0,68	0,00	20,88	228,52	-78,74	149,77	-10,22	0,00	8,57

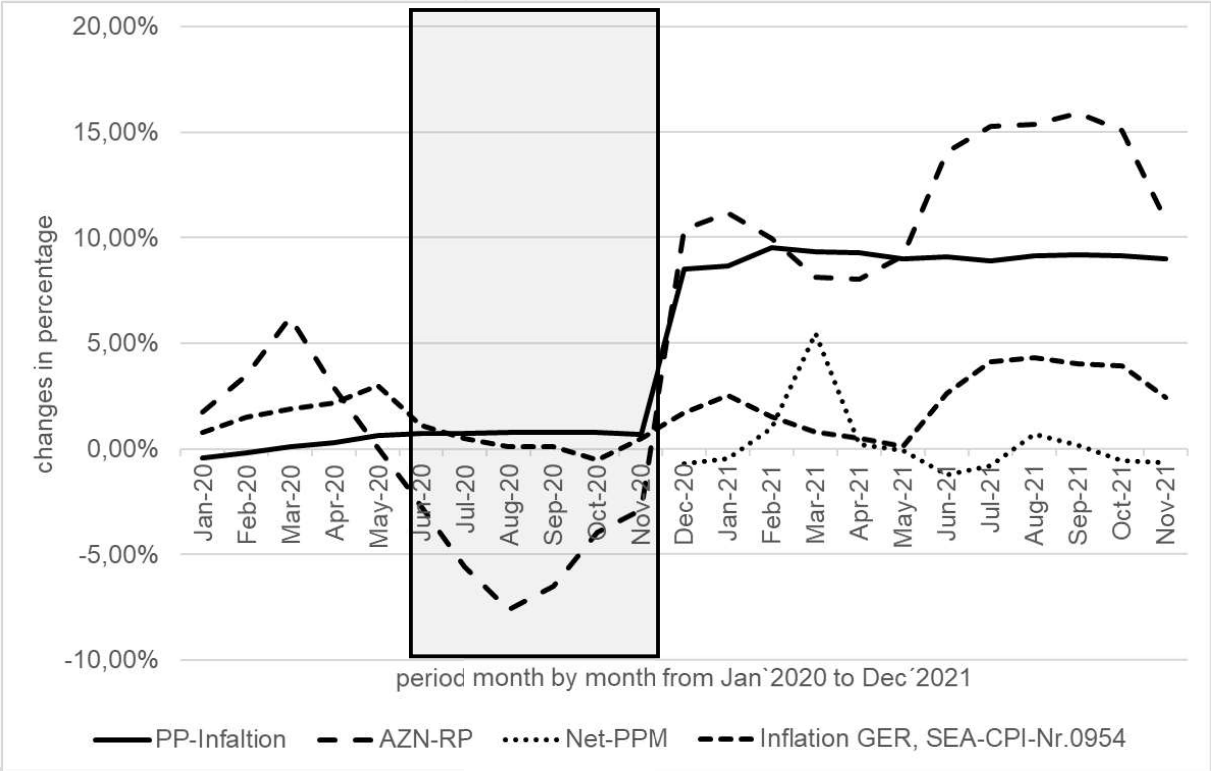
Source: own research

Figure no. 1: Amazon buy box quota month by month from Jan´2019 to Dec 2021.



Source: own research

Figure no. 2: Comparison of German Federal Statistical Inflation with Amazon retail price index, Amazon purchase price index and Amazon net pure profit margin in the period January 2020 to December 2021



Source: own research

Table no. 5: German Federal Statistical Office 3rd Stellar Level Inflation from January 2020 to December 2021 for the Goods Class Stationery and Drawing Materials (SEA CPI No. 0954).

Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
1.70	0.80	1.50	1.90	2.20	3.00	1.10	0.50	0.10	0.10	-0.50	0.50

Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
1.70	2.50	1.50	0.80	0.50	0.10	2.60	4.10	4.30	4.00	3.90	2.40

Source: own research