

# UNION OF ENTREPRENEURS AND EMPLOYERS

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## FORMING OF BUBBLES AND THE COMPETITIVENESS OF THE EUROPEAN UNION

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# EXECUTIVE SUMMARY

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- Emission allowances market cannot be considered free. LRF and MSR mechanisms artificially restrict demand. On the supply side, investors are free to exploit the fact, that some EUA buyers need it to conduct their business. EUA do not have an upper price limit, as the penalty for emitting without allowances does not release from the obligation to buy such allowances.
- EUA price time series exhibit memory and volatility clustering. They change in a fashion similar to futures contracts on Brent and natural gas. EUA prices are not, however, cointegrated (and thus long term linked) with Brent prices. This may indicate that investors consider emission allowances as assets similar in their speculative nature to oil.





- SADF and GSADF tests indicate that price bubbles have been forming on all three analyzed series. A bubble is forming at the moment.
- EUA price bubbles influence energy intensive industries to relocate outside the EU. These industries often supply key resources (e.g. steel), essential for European industry's competitiveness.
- COVID 19 pandemic has shown the danger of relying exclusively on importing necessary technologies and prefabricates. During an international crisis, any technological advantage the EU might have, will be nullified when not supported by resources.
- Planned reform of the EU ETS, especially reducing the number of free aviation allowances (EUAA) and extending the system to maritime transport is a threat to the competitiveness of the entire EU. Probable consequences of reforms proposed by the European Commission include increased prices of imported goods, which may result in trade wars with the rest of the world.



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# REASONING BEHIND AND RULES OF THE EU ETS SYSTEM

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European vision of international competitiveness differs significantly from American. While the USA focus on productivity, EU shares the view of continental economists (e.g. Aiginger et al. 2015), who recommend focusing on overall wellbeing and goals "beyond GDP". Following this view, the EU concentrates on providing its inhabitants the best possible quality of life. A part of philosophy is ecology and emission reduction of greenhouse gases and other pollution.

**In 2005 a mechanism supporting these plans was introduced: the European Emission Trading System (EU ETS [1]). Reduction targets, designed at bringing the EU to climate neutrality by 2050, were established. These were introduced in four stages. In this moment, the fourth stage, planned for 2021-2030 has just begun. It aims to reduce CO<sub>2</sub> emissions by 55%, compared to the 1990 levels [2].**



[1] This report analyzes only one type of allowances, EUA.

[2] The European Green Deal Increasing the EU's climate ambition for 2030 and 2050, Brussels, 11.12. 2019.

The EUA system allocates free emission allowances to chosen enterprises.

This mechanism does not, however, meet the entire demand. Installations that have not received free allowances or are – for whatever reasons – unable to restrict their emissions, are obliged to buy allowances on the free market. These are sold by Installations with a surplus, i.e. those that do not utilize their allocation fully. To facilitate the process of reducing the emissions of greenhouse gases, the number of free allowances decreases yearly.

Auctions are the primary way of trading EUA allowances [3]. The largest trading platform, European Energy Exchange (EEX) operates from Leipzig. EUA based transactions can also be concluded on the ICE Futures Europe, based in London. On January 1st 2021 British emission system (UK ETS) replaced Great Britain's participation in the EU ETS system. Initial approach to free allowances in the UK ETS system will be similar to one proposed to UK in the 4th stage of EU ETS. This is meant to ensure a smooth transition between systems [4]. ICE Futures Europe will continue providing an auction platform and aftermarket services for UK ETS until December 2022.

**EUA includes two mechanisms designed to accelerate the rate of emission reduction by decreasing the supply of available allowances.**

**These are:**

- 1. LINEAR REDUCTION FACTOR (LRF).**
- 2. MARKET STABILITY RESERVE (MSR).**



[3] Detailed information can be found in the Commission Regulation (EU) No 1031/2010 of 12 November 2010.

[4] Participating in the UK ETS, BEIS, 28.06.2021, <https://www.gov.uk/government/publications/participating-in-the-uk-ets/participating-in-the-uk-ets>.



## LFR

up until the end of the 3rd stage of ETS program equaled 1.74%. This meant that the number of available allowances decreased yearly by this percentage. Stricter reduction targets in the 4th stage brought the LFR to 2.2% yearly [5].

## MSR's purpose is

to control both the number of available allowances and the rate of surplus removal. In the previous stage, EUA surplus amounted to 1.5B [6]. MSR adjusts the auction volume by taking into consideration the number of unused allowances accumulated in the system.

The procedure is as follows [7]:

- when there is a surplus, i.e. the overall number of available allowances exceeds 833 M, the yearly auction volume is decreased by 12% (24% compared to 2019-2023);
- when the surplus falls below 400M or the allowance price in the last 6 months is more than three times larger than average price in the last 2 years, auction volume is increased by 100M

From 2023 onwards, the MSR system will aim to annul extra allowances above the auction volume from the previous year.

[5] Report on the functioning of the European carbon market, European Commission Brussels, 18.11.2020.

[6] Publication of the total number of allowances in circulation in 2020 for the purposes of the Market Stability Reserve under the EU Emissions Trading System established by Directive 2003/87/EC.

[7] Market stability measures, Design, operations and implications for the linking of emissions trading system, February 2020.





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# **MICROECONOMICS OF THE EUA MARKET**

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EUA market cannot be considered a free market, as indicated by the analysis of both supply and demand conditions. Such analysis is important while discussing price bubbles, which has been stressed by numerous economists, for example Girdzijauskas et al. (2009). This report assumes, in accordance with the author's previous work on the subject (Lachowicz, 2021), that there exist two groups of EUA buyers.

**EUA Installations need allowances to conduct business in their sectors. An example of such might be heat-power plants which utilize fossil fuels. The original idea behind the system assumed that Installations with a surplus of allowances would be able to sell EUA to those with shortages. The specifics of the system, however, caused EUA Investors to join the market. They form the second set of EUA buyers. Investors do not need allowances to conduct their business. To them, EUA are just one of many products available on financial markets. Investors are interested in buying financial instruments either to make a profit (arbitral, due to price differences between markets or speculative, due to price differences) or to hedge against price fluctuations.**



# DEMAND SIDE

## **Fundamental ways for buyers to counteract an undesired price increase are:**



**Availability of substitutes.** This is a natural barrier to price growth. Price increase may cause a product to fall outside of the buyer's budget constraint, who would then either choose a cheaper alternative or a substitute that offers a better combination of price and utility. It has to be noted, that Installations do not have a substitute for allowances, whereas Investors can substitute the EUA for virtually any financial instrument, especially resource-based futures contracts.



**Demand adjustment.** If there are no viable substitutes, a consumer can usually react to a price increase by decreasing demand.



**Increase the price of goods or services sold.**





## **Investors can utilize the abovementioned mechanisms freely.**

EUA are one of many financial instruments they can invest in. The number of available substitutes is unlimited. Investors can also adjust their demand for EUA and increase the prices of their services, if necessary. Volume and liquidity of their financial resources are significant. Barriers to entry are relatively small, especially in the case of individual investors. Becoming an institutional investors involves a number of procedural requirements, but to financial institutions this is merely a nuisance, not a barrier. This means, that EUA demand can increase also due to the inflow of new individual investors, which exerts appreciative pressure on the price.

The second group of buyers, i.e. EUA Installations need CO<sub>2</sub> emission allowances to conduct their business. EU market lacks alternative allowances, therefore the basic mechanism of price control – the ability to buy a substitute – is unavailable. It has to be noted, that although EUA Installations can become clients of EUA Investors and give them orders to buy or sell allowances, this does not secure their interests properly. Although, in theory, a futures contract is an obligation to buy (or sell) for a certain price in the future, these obligations depend on the expectations of other players in the market.

**Demand adjustments are also limited, time consuming (at least several months) and costly. EUA Installations have the following options:**



Adjusting their production process, so that CO2 emissions are reduced.



Decreasing their production. In the energy sector this is nearly impossible. Energy systems are built for supply to equal demand. Any surpluses or shortages are balanced via exports and imports. In Poland, this is possible, because Polish energy system is integrated with the European. An exception to this would be a long term decrease in the demand for energy. Households' demand is stable, however, therefore the impulse would have to originate in the industry, for example due to a drop in industrial production. Long term decreases in industrial production happen during recessions, though. Downturns and recessions observed in the last decades have been too short to justify shutting down power units. A decrease in energy consumption may, however, necessitate powering them temporarily down. Another way to limit energy production is to rely on imports. This is however a threat to national security. Finally, enterprises from other sectors, utilizing emission allowances, cannot rapidly adjust their production if EUA prices were to suddenly increase, due to, among others, obligations towards their clients.



Moving the production to another country, not bound by allowances system. This solution is already being implemented in several sectors, for example steel production. This is a threat to both Polish and European economies, as elaborated on further in the report.





**It needs to be noted, that EUA Installations, while attempting to quickly reduce CO<sub>2</sub> emissions,**

will utilize resources that could be spent elsewhere, for example on investments, including investments in emission-reducing technologies in a slightly longer time frame. Bubbles forming on EUA prices are even more dangerous, as this would require EUA Installations to form reserves, that would allow them to purchase allowances even if their prices would inflate.

Increasing the prices of produced goods and services is also problematic. Contracts are usually long term. In Poland, allowances are mostly used by energy sector, which finds it hard to increase prices for political reasons. Finally, producing energy when allowances are cheap and releasing it to the grid when EUA prices rise is impossible, due to insufficient storage technology.

**Demand adjustments are also limited, time consuming (at least several months) and costly.**



# SUPPLY SIDE

EUA demand is influenced by a number of mechanisms implemented in the very directives introducing the EU ETS system. Two most important are:

- 1. LINEAR REDUCTION FACTOR (LRF).**
- 2. MARKET STABILITY RESERVE (MSR).**

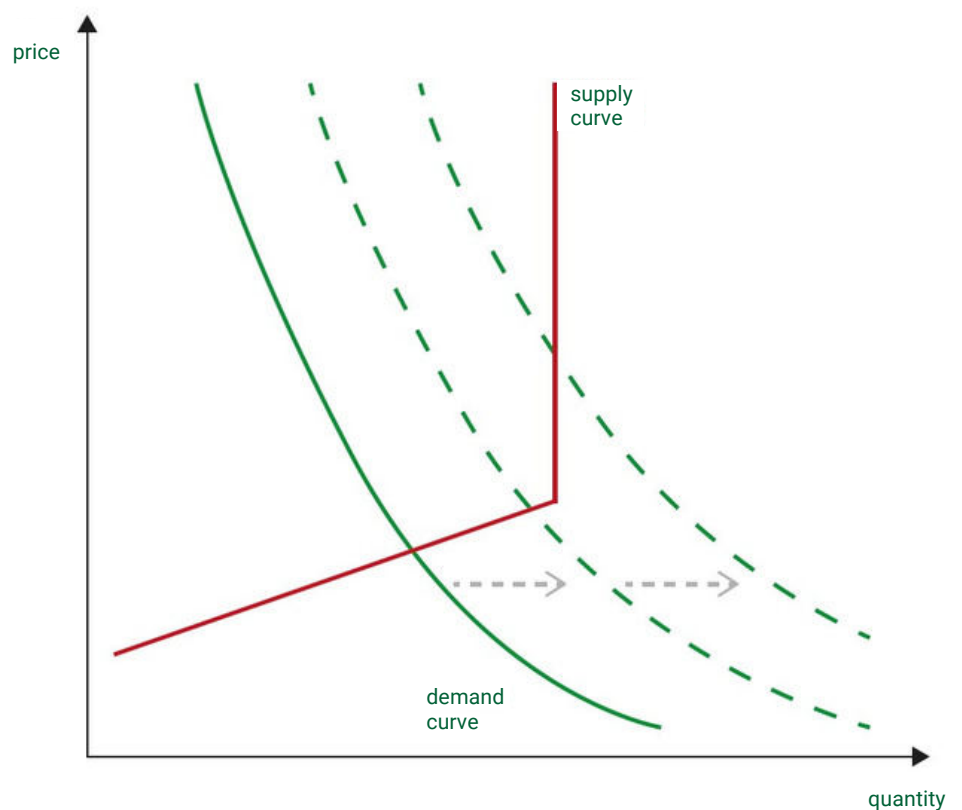
The functioning of these mechanisms has been presented in the introduction. LRF decreases the number of available allowances yearly. MSR reserve, via the invalidation mechanisms, prevents a surplus from appearing, by removing some of the allowances available on the market. Such a surplus can be a result of, for example, diminishing demand for EUA.

The aforementioned factors influencing the supply and demand sides cause (in the short term) the demand for EUA to be inelastic and the supply limited.




Supply and demand curves are drawn on Figure 1, which presents in a simplified way, microeconomic relationship between supply and demand on the EUA market. The first shift of the demand curve results in a moderate price increase. Some additional allowances appear on the market. These were the property of those institutions that have been unwilling to sell them previously, but decided to do so, once a shift in demand put upward pressure on EUA prices. At some point, there will be no fresh allowances to enter the market, however. From this moment on, the only result of a positive demand side shock will be a price increase.

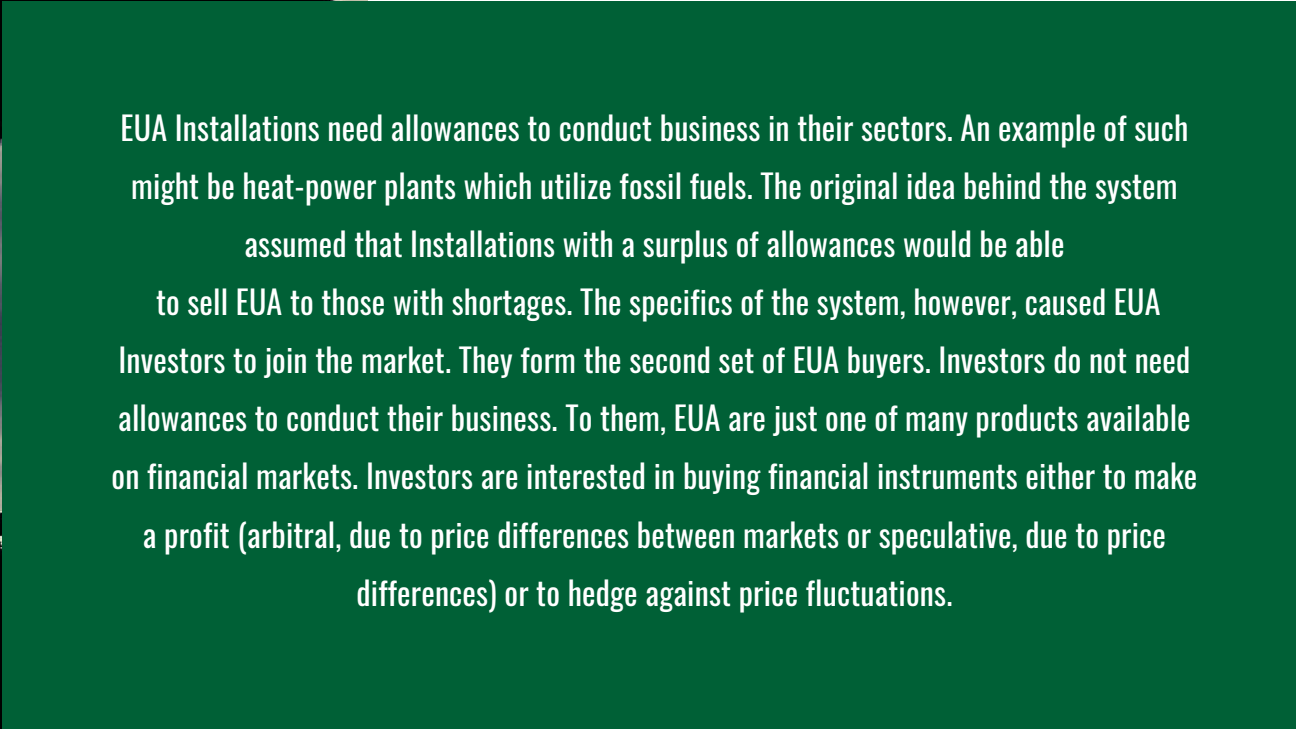
**Figure 1. Microeconomic price model EU ETS**



Source: own study



Such a situation can occur, e.g. when more Individual Investors will be interested in buying EUA. This will strongly appreciate EUA prices (demand side shock). From Investors' perspective, this course of action is relatively risk free. EUA Installations are forced to buy allowances to conduct their business anyway. There is no upper price limit. In theory, the penalty for emitting CO<sub>2</sub> without the necessary allowances could be such a limit. Such a penalty exists and equals circa 100 EUR per ton, but does not dispense the obligation to settle emissions, and therefore equals the current EUA price + 100 EUR. This means that EUA prices have no upper limit.



EUA Installations need allowances to conduct business in their sectors. An example of such might be heat-power plants which utilize fossil fuels. The original idea behind the system assumed that Installations with a surplus of allowances would be able to sell EUA to those with shortages. The specifics of the system, however, caused EUA Investors to join the market. They form the second set of EUA buyers. Investors do not need allowances to conduct their business. To them, EUA are just one of many products available on financial markets. Investors are interested in buying financial instruments either to make a profit (arbitral, due to price differences between markets or speculative, due to price differences) or to hedge against price fluctuations.

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# TIME SERIES ANALYSIS

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In this report, three time series are analyzed:

1

Monthly, from **January 1st 2019** to **June 30th 2021**,  
78 observations, i.e. last 26 quarters.

2

Weekly, from **July 1st 2019** to **June 30th 2021**,  
104 observations, i.e. last 8 quarters.

3

Daily, from **October 1st 2020** to **June 30th 2021**,  
191 observations, i.e. last 3 quarters.

*Data was downloaded from investing.com, access date July 8th 2021.*

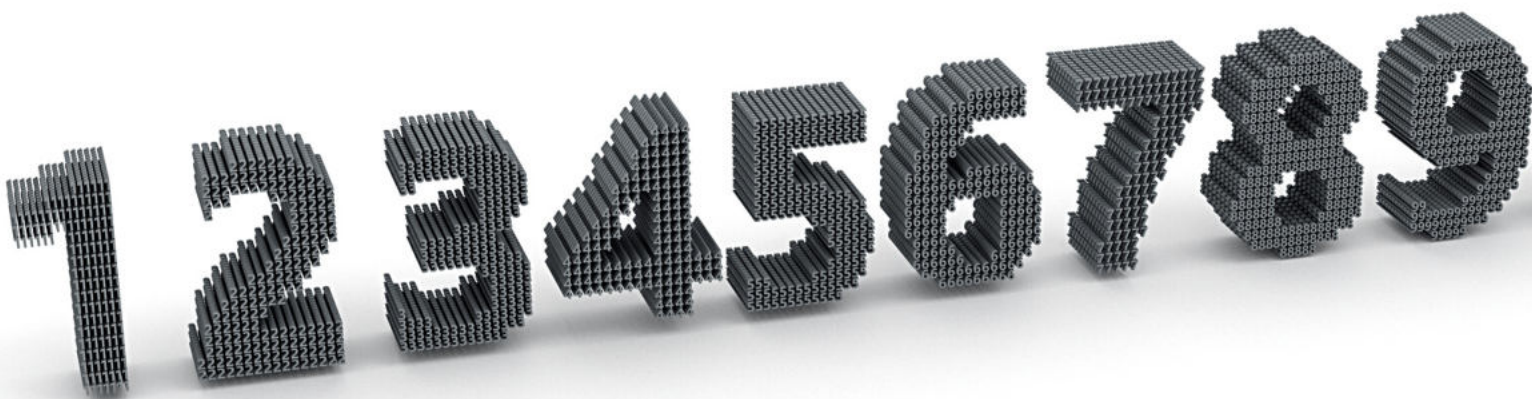




# INITIAL EVALUATION

Initial stability of the series was tested in the author's previous report on the subject (Lachowicz, 2021, Polish only). Johansen's cointegration test (Johansen, 1991) was employed to check, whether EUA prices are influenced by fundamental factors (Menegaki, 2014): EU 27's nominal GDP and Brent price [8]. Test statistics have failed to exceed critical values even at 90% confidence level. According to Granger's representation theorem, EUA prices are therefore not influenced in the long term by the aforementioned variables. This lends support to the view, that EUA prices lack long term stability, which facilitates the formation of bubbles.

Seasonality tests provide important information on the behavior of analyzed time series. Many economic variables change, depending on the period. For example, demand for heat is higher during winters and decreases in the summer [9]. To check, whether EUA prices exhibit seasonality, general seasonality test was used (Webel, Ollech, 2020) [10]. Only the monthly series was tested, due to its range and relatively low frequency [11]. The test failed to reject the null hypothesis of no seasonality, therefore it can be assumed that EUA prices are not seasonal.



[8] EUA and Brent quarterly data at close downloaded from investing.com. EU27 GDP from Eurostat.

[9] Some of this is offset by additional electricity demand from air conditioning.

[10] R implementation in the seastests package.

[11] Seasonality is rarely analyzed in data with higher frequency than monthly, except some weekly supply-demand studies.

# VOLATILITY CLUSTERING

The first step in volatility analysis was testing the memory of analyzed variables. If the time series exhibit long memory, it means that past values influence present ones. In the opposite case, present values do not depend on past ones. Hurst coefficient, which analyzes the process' autocorrelation, was calculated in order to test the series' memory [12].

Values between 0.5 and 1 indicate long memory, that is high values tend to group together (upturn) as do low ones (downturn). If in the period  $t$ , the value was high, it is likely it will also be high in the period  $t+1$ . Coefficient values between  $<0; 0.5$  indicate that high and low values mix with each other.

**TABLE 1:**  
**HURST COEFFICIENT AND MEMORY TEST FOR THE THREE SERIES.**

SERIES	HURST COEFFICIENT [13]	INTERPRETATION
MONTHLY	0.80	THE SERIES HAVE EXHIBITED LONG MEMORY FOR THE LAST FEW YEARS. IT IS PROBABLE, THAT A HIGH (LOW) PRICE IN THE $T$ PERIOD WILL BE FOLLOWED BY A HIGH (LOW) THE PRICE IN THE PERIOD $T+1$ .
WEEKLY	0.79	THE SERIES HAVE EXHIBITED LONG MEMORY FOR THE LAST FEW QUARTERS. IT IS PROBABLE, THAT A HIGH (LOW) PRICE IN THE $T$ PERIOD WILL BE FOLLOWED BY A HIGH (LOW) THE PRICE IN THE PERIOD $T+1$ .
DAILY	0.84	DAILY SERIES ALSO EXHIBITS MEMORY. EVEN IN DAY TRADING, IT IS PROBABLE, THAT A HIGH (LOW) PRICE IN THE $T$ PERIOD WILL BE FOLLOWED BY A HIGH (LOW) THE PRICE IN THE PERIOD $T+1$ .

Source: own evaluation, pracma package, R.

[12] R implementation in the pracma package.

[13] Hurstexp provides several coefficient, classical one was given in table 1.

[14] R implementation in the TSclust package.

## To check, whether EUA prices change

in a similar way to other resource based futures contracts, weekly EUA price changes were compared pairwise with weekly price changes of Brent and natural gas futures. For this purpose, time series dissimilarity index was used (Chouakria, Nagabhushan, 2007) [14]. Euclidean distance was chosen as a distance measure was Euclidean, since it is commonly employed in statistics. The  $k$  parameter was set at 1.5, so that both values and behavior of changes influence the index similarly. Data was downloaded from [investing.com](https://www.investing.com). The series start on July 1st 2019 and end on June 30th 2021, so that the length of both series is identical to the weekly EUA series. Only weekly series were analyzed, in order to provide high

frequency data but also minimize the risk of delays or decision uncertainty. On financial markets, these last at most a few days.

For both natural gas and Brent oil, values of the dissimilarity index were high, respectively 77.30 and 64.55. This suggests that EUA futures' prices change in a similar manner to traditionally speculative oil and gas futures. Particular attention should be paid to Brent futures. It has been established that EUA prices are not influenced in the long run with Brent prices (no cointegration relationship). The similarity of weekly price changes of both contracts supports the theory, that Investors may consider EUA as a speculative asset, akin to oil.

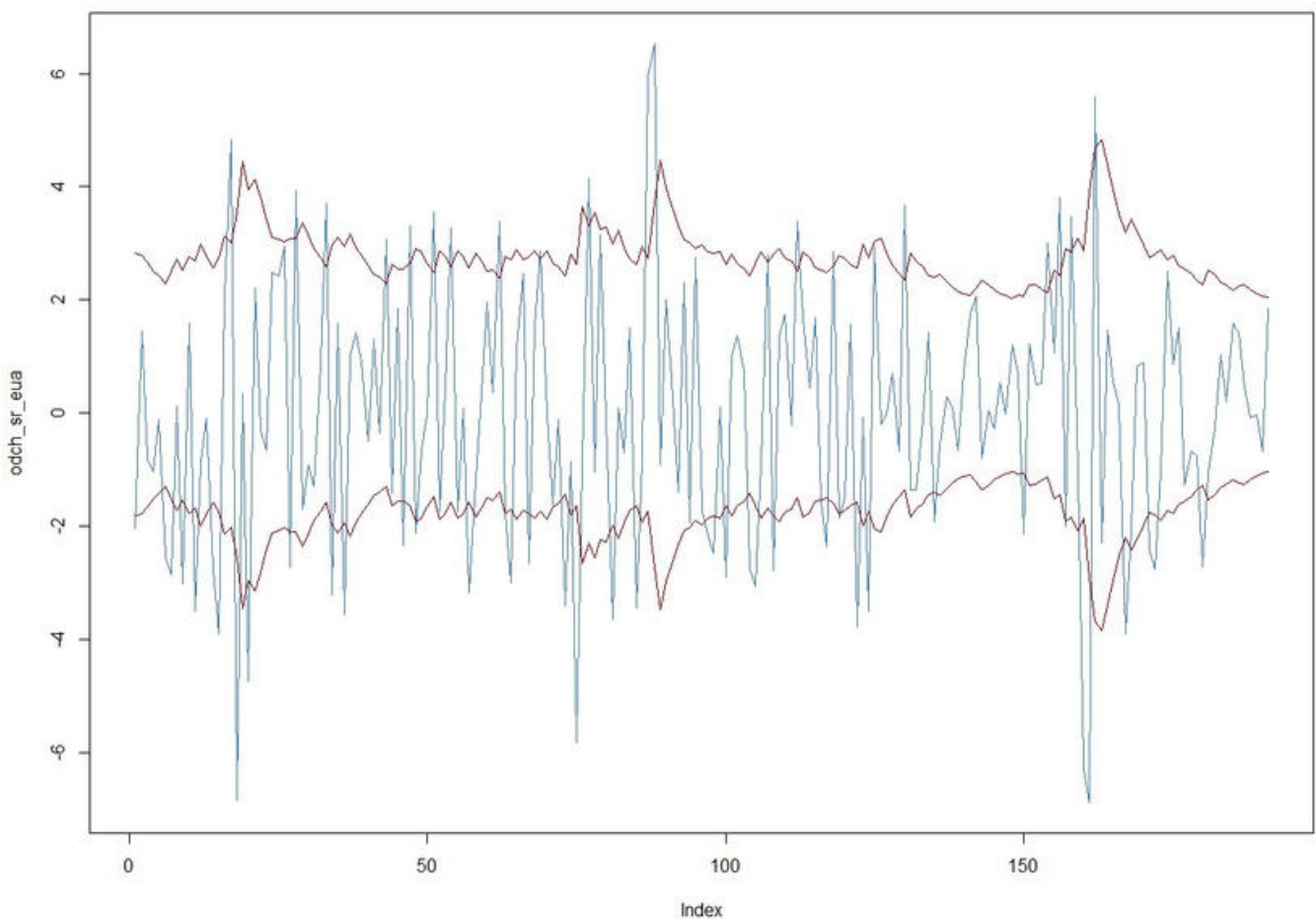


## Volatility analysis of EUA prices was concluded by fitting a GARCH model.

These model not only the expected value of the analyzed variable, but also its variance. Volatility clustering means that periods of rapid changes are intertwined with relatively calm ones.

If a GARCH model fits data relatively well (ideally, the fit is better than that of a standard time series decomposition), it can be assumed that EUA prices exhibit volatility clustering. The (1,1) GARCH model was fitted to daily EUA changes [15].

**Figure 2: Garch model. Estimated variance plus/minus one standard deviation from the mean.**



Source: own evaluation, FGarch package.



Figure 2 suggests that even a simple GARCH model fits the recent price fluctuations relatively well, since price changes rarely exceeded one standard deviation from the expected value.

This lends support to the theory, that in the past few months, EUA prices have exhibited volatility clustering.

### **Volatility analysis has therefore indicated, that:**

**1**

EUA prices exhibit relatively long memory, even in high frequency and short range series. This means that a high (or low) EUA price will likely be followed by another high (or low) price in the next period. This facilitates the formation of bubbles, up until the crash.

**2**

Although there are no long term, cointegration – based relations between EUA prices and fundamental factors, weekly changes between EUA, Brent and gas futures prices are remarkably alike. This suggests that Investors consider EUA to be a similarly speculative asset as oil.

**3**

Even a simple GARCH model fits the recent price changes on the EUA market rather well, which indicates volatility clustering.



# BUBBLES

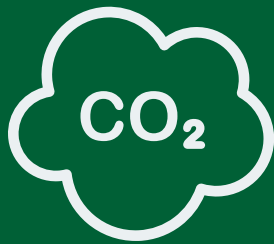
The basic tools to determine, whether bubbles form on the EUA prices, are SADF and GSADF tests (Phillips et al. 2011; Phillips et al. 2014; Phillips et al. 2015). These allow to identify changes in the price of analyzed instruments, that exceed normal volatility [16]. Their principle is similar. Null hypothesis assumes that the series possess an unit root [17] and the alternative assumes explosiveness. Both tests, in the quoted articles, were used to evaluate monthly series. Here, they are used to analyze all three.

Although in financial economics, frequency does not substitute for range, due to factors such as memory or economic growth cycles (Andersen, 2000), analyzing shorter range series provides important information regarding the changes of EUA prices. Lag length was set at 1, due to the recommendations from Phillips and others. Prices at close were analyzed. The number of Monte Carlo replications for critical value evaluation equals 2500.



[16] Both tests are specifically designed for instruments similar to EU ETS. These instruments cannot be analyzed via the standard approach, which compares stock prices with discounted values of their future dividends. These tests were used by Areal and others (2014) to verify the presence of bubbles on food prices, which, in are in many ways similar to EUA.

[17] Which means that after differencing, the series will be stationary, i.e. its moments will be constant in time. In economics, series are usually integrated in the first degree (require single differencing). Only weak stationarity is usually required, that is only the series' mean and variance need to be constant in time.



**TABLE 2:  
SADF AND GSADF TEST RESULTS  
FOR THREE EUA PRICE SERIES**

SERIES	RANGE	SADF, H0 = NO BUBBLES	GSADF, ENTIRE SERIES, H0 = NO BUBBLES	CONCLUSION
MONTHLY	01.01.2015-30.06.2021	REJECT FOR THE LAST 4 MONTHS AT 95% CONFIDENCE LEVEL. REJECT FOR THE LAST 3 MONTHS AT 99% CONFIDENCE LEVEL. REJECT FOR THE SERIES AT 99% CONFIDENCE LEVEL.	REJECT AT 99% CONFIDENCE LEVEL	PRICE BUBBLES HAVE APPEARED IN THE PAST AND ARE FORMING AT THE MOMENT.
WEEKLY	1.07.2019-30.06.2021	REJECT FOR THE SERIES AT 99% CONFIDENCE LEVEL. REJECT FOR THE LAST 10 WEEKS AT 95% CONFIDENCE LEVEL.	REJECT AT 90% CONFIDENCE LEVEL	PRICE BUBBLES HAVE APPEARED IN THE PAST AND ARE FORMING AT THE MOMENT (LAST 10 WEEKS).
DAILY	1.10.2020-30.06.2021	REJECT FOR THE SERIES AT 95% CONFIDENCE LEVEL. MOST RECENT OBSERVATIONS DO NOT INDICATE THE FORMATION OF BUBBLES, THOUGH.	REJECT AT 99% CONFIDENCE LEVEL	PRICE BUBBLES HAVE APPEARED IN THE PAST, MOST RECENTLY AT THE BEGINNING OF MAY.

**TABLE 3.****CRITICAL VALUES FOR THE SADF AND GSADF TESTS.  
MONTE CARLO SIMULATION, 2500 REPETITIONS**

SERIES	SADF STATISTIC	MAX SADF CRITICAL VALUE FOR 99% CONFIDENCE LEVEL	GSADF STATISTIC	GSADF CRITICAL VALUE FOR 99% CONFIDENCE LEVEL
MONTHLY	3,89	1,711	3,98	2,97
WEEKLY	2,11	1,963	2,22	2,92
DAILY	2,02	1,876	3,08	2,79

Source: own evaluation, package MultipleBubbles, R

The results of SADF and GSADF support the rejection of null hypothesis of no bubbles in all three series. This confirms both theoretical discussion and memory, similarity and volatility analyses. It has to be noted, that the tests do not attempt to predict the moment

when the EUA bubble will burst. They simply indicate that such a bubble forms itself at the moment. Price bubbles on financial instruments can develop for years only to suddenly burst, vide dotcom bubble case (e.g. Ofek, Richardson, 2003).





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# SUMMARY AND CONCLUSIONS

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Bubbles can form on EUA prices primarily due to the very construction of the ETS system. More specifically, this is due to restrictions placed on the supply side by LRF and MSR mechanisms. On the demand side, buyers needing EUA to conduct their business (EUA Installations) are forced to buy allowances at any price, since the penalty for emissions without allowances, does not dispense the obligation to settle the emissions anyway. Installations have no substitutes for EUA.

Adjusting their demand for allowances is complicated and time consuming. On the other hand, financial institutions (EUA Investors), seek either hedging or profit. They have significant funds at their disposal. There are little to none barriers to entry.

## **Because of that,**

EUA Investors can exert upward pressure on the demand side, causing the price to rise. They are also fully aware that EUA Installations will accept

any price increase. Although EUA Installations can buy allowances via Investors, this is hardly a solution to the problem.

## Statistical and econometric methods

employed in the report support microeconomic reasoning. EUA prices are not bound in the long term to fundamental macroeconomic variables. Lack of cointegration relationship with EU 27 GDP is particularly troubling. GDP is a wide aggregate and therefore is linked to a lesser or greater degree, with virtually any important macroeconomic variable. Thus, it can be concluded, that EUA prices do not depend on the current economic situation in the EU. Historical EUA data have also exhibited no seasonality for the past 26 quarters, that is 6.5 years. In light of the above, rapid price increases happening recently, cannot

be explained by seasonal factors, such as, for example, spring. Finally, EUA prices possess long memory and exhibit signs of volatility clustering, which means that both high increases and low drops have a tendency to accumulate.

These conclusions are supported by Philips' SADF and GSADF tests, which clearly indicate, that price bubbles are forming on EUA prices in this moment. Importantly, these results have been confirmed for all three series, i.e. monthly, weekly and daily data. This stands in stark contrast with the results from April. Back then, only the monthly series supported the hypothesis of bubble formation, whereas weekly and daily series did not.

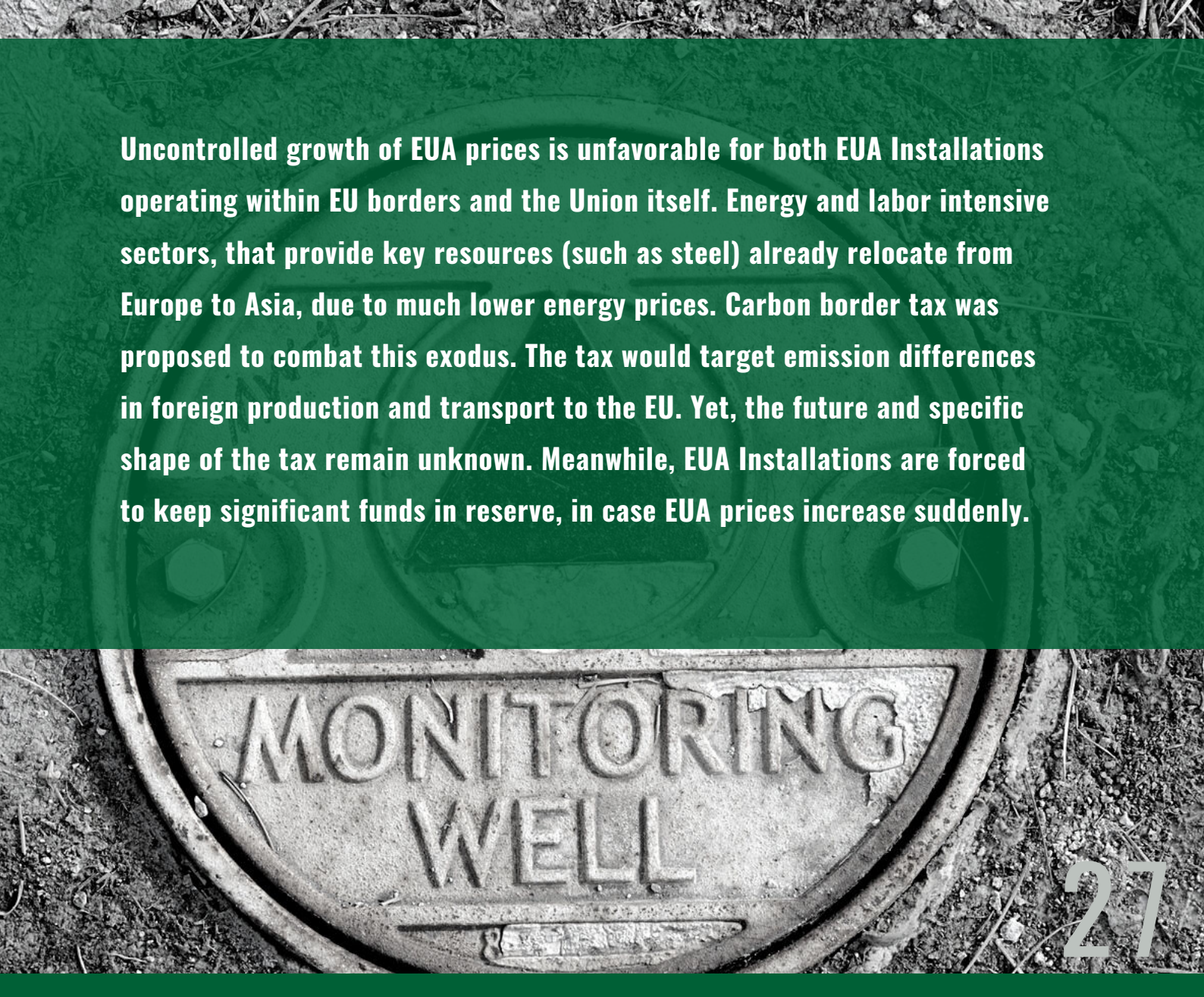
The analysis indicates not only that price bubbles are forming right now and that the specifics of the market favor the creation of such bubbles. Some important questions regarding the history of EUA prices have been answered. They are not linked in the long term with fundamental economic variables, are not seasonal and exhibit volatility clustering. Thus, it can be stated that the current period of price bubble can last for months and even a short – time price drop does not mean that a new bubble cannot appear in the near future.



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# CONSEQUENCES

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Uncontrolled growth of EUA prices is unfavorable for both EUA Installations operating within EU borders and the Union itself. Energy and labor intensive sectors, that provide key resources (such as steel) already relocate from Europe to Asia, due to much lower energy prices. Carbon border tax was proposed to combat this exodus. The tax would target emission differences in foreign production and transport to the EU. Yet, the future and specific shape of the tax remain unknown. Meanwhile, EUA Installations are forced to keep significant funds in reserve, in case EUA prices increase suddenly.

## This limits their investment

and modernization capabilities as well as prevents them from providing better working conditions to their employees. Money spent on more expensive allowances could be also spent on emission reduction systems, which would decrease the overall emission level in the EU.

Allowing key industry suppliers to leave the EU borders is dangerous geopolitically. Securing the deliveries of necessary resources is fundamental to every economy. Theoretically, globalization should provide all countries means to obtain resources even if primary suppliers fail to deliver, but COVID 19 has shown that international agreements are not always respected. In a future conflict, cutting supply lines can have catastrophic consequences for the entire EU. Shortages of prefabricates and materials nullifies any technological advantages the EU might have. On the other hand, countries with resources will continue to produce, even if they do not possess the newest

technology. If some sectors (for example steel production) leave the EU completely, rebuilding would require at least a decade, due to lost knowledge and lack of trained professionals. During such period, the EU would be forced to import resources from abroad, not necessarily for a fair price. Meanwhile increased emissions in transport and foreign production can exceed emission reductions achieved in the EU.

In light of the planned changes in the entire EU ETS system it is fair, that the report concludes with a short overview of the European Commission's proposals, presented in the "Fit for 55" package. Key reforms include:

- reducing the number of free allowances for aviation (EUAA);
- Introducing EU ETS in the marine transport;
- Tightening the LRF and MSR mechanisms;
- Reducing energy consumption;
- Stricter emission standards for vehicles;
- Taxing energy production in accordance with EU's climate policy;
- Carbon border tax.







These proposals do not address issues with the EUA system presented in this report. On the EUA market, Installations will continue to depend on the Investors' actions. Stricter LRF and MSR requirements reduce the EUA supply, which is a factor favoring the formation of bubbles. Introducing EU ETS in the marine transport and reducing the number of EUAA allowances will most likely trigger an increase in prices of imported goods.

This includes resources, which are produced abroad to an even greater extent due to so called 'carbon leakage'. This is an additional threat to EU's international competitiveness. The Union can attempt to counteract the increase in the price of imports by increasing the prices of exports (for example technology).

### **It has to be noted,**

though, that any technological advantages the EU might once had had over Asia have been nullified. Carbon border tax is a solution to some of the issues, but its specifics are unknown, as is its introduction. Moreover, CBAM will further restrict free trade between the EU and the rest of the world (isolationism). Carbon border tax can be treated as an additional tariff on imports and EU's


trade partners will most likely introduce their own tariffs in return. Consequences of such a course of action include even higher costs of imports and worsening the situation of industrial companies operating from the EU and exporting their goods beyond the Union. In the long run, this will be a threat to EU's qualitative competitiveness on the global markets. Despite its size and potential, the EU cannot be considered an autarky.

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# REVIEW

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Prof. Jacek Tomkiewicz, Ph.D.  
Kozminski University

Opinion on the study by Marek Lachowicz  
entitled "Forming of bubbles and  
the competitiveness of the European Union".

Lachowicz's is noteworthy for several reasons. First of all, the problem that is analyzed is one of the key areas of climate policy, and this undoubtedly constitutes an increasingly important element of economic policy, which determines the conditions for the functioning of the world economy. The assessment of whether the current price of CO2 emission allowances results from the development of fundamental structural factors, or rather is the result of short-term speculative movements, is of crucial importance for determining the effectiveness of climate policy instruments. The author, using the economic analysis of the market and, above all, statistical tools, tries to indicate which factors are mainly responsible for the current valuation of emission rights.

Marek Lachowicz presents the basic principles on which the European market of CO2 emission rights is based. This is a starting point for the analysis of the economic aspects of this issue. It shows the traded item and the factors responsible for supply and demand in this market. As for the supply - the matter is simple here: political decisions determined the amount of allowances offered on the market. In the case of demand, the situation is more complex, because apart from fundamental factors such as the size and structure of the economy, the motivations of investors are also important, as they treat emission rights not as production factors, but as an opportunity to achieve a return on invested capital, which is possible in large changes in the valuation of an asset that is traded.

The most important part of the study is quantitative research, which is to answer the question of how legitimate is the claim that we are seeing a price bubble on the market for CO<sub>2</sub> emissions. An attempt was made to isolate fundamental factors (GDP level in EU countries, current oil price), which should have an impact on the valuation of emission rights. The causality tests did not show such a relationship, which makes it possible to suspect that speculative factors resulting from expectations as to certain behaviors of market participants are of greater importance. Statistical analysis of prices for CO<sub>2</sub> emissions allows us to believe that a price bubble may appear on the market, which of course does not determine whether and when we can expect a significant correction.

The conclusions of the research carried out are of fundamental importance. It must be remembered that the emission allowance market, which is analyzed in this study, relates to the EU economy, and thus

largely determines the competitiveness of EU economies compared to the rest of the world. The valuation of emission rights, which does not result from fundamental structural factors, proves that this instrument has limited effectiveness in motivating countries and individual economic entities to behave pro-ecologically. The high price of emission allowances and the high volatility of the market may at the same time be a factor that greatly undermines the competitiveness of EU economies and is a significant risk factor for economic activity in the EU.

To sum up, the study by Marek Lachowicz obviously cannot be treated as unambiguous, direct evidence that the emission allowance market is subject to short-term / speculative factors rather than to structural changes in the economy, but undoubtedly the arguments and results of the author's research should be taken seriously into account by both economic politicians and market participants.





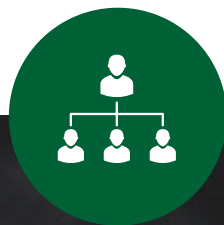
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