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TITLE:

The effect of government response to Covid-19 on currency exchange rate: analysis of Norway, Sweden, and Denmark

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Abstract

This master thesis investigates the effect of the government response to the spread of Covid-19 virus on currency exchange rate in three Scandinavian countries – Denmark Norway and Sweden in the period January 2020-March 2021. Government response to the spread of Covid -19 is measured by an index calculated by a group of researchers at Oxford university. Our findings suggest that the way governments respond to the spread of Covid-19 affects currency exchange rates in all three countries. The effect leads to currency depreciation.

Preface

With this thesis we complete our Master of science in Business administration with specialization in applied finance.

We are very grateful to our supervisor Associate professor Siri Valseth for her constant support, positivity, inspiring ideas, and constructive feedback during the writing process.

We would also like to thank our families, who supported us through studies and writing of this Master thesis.

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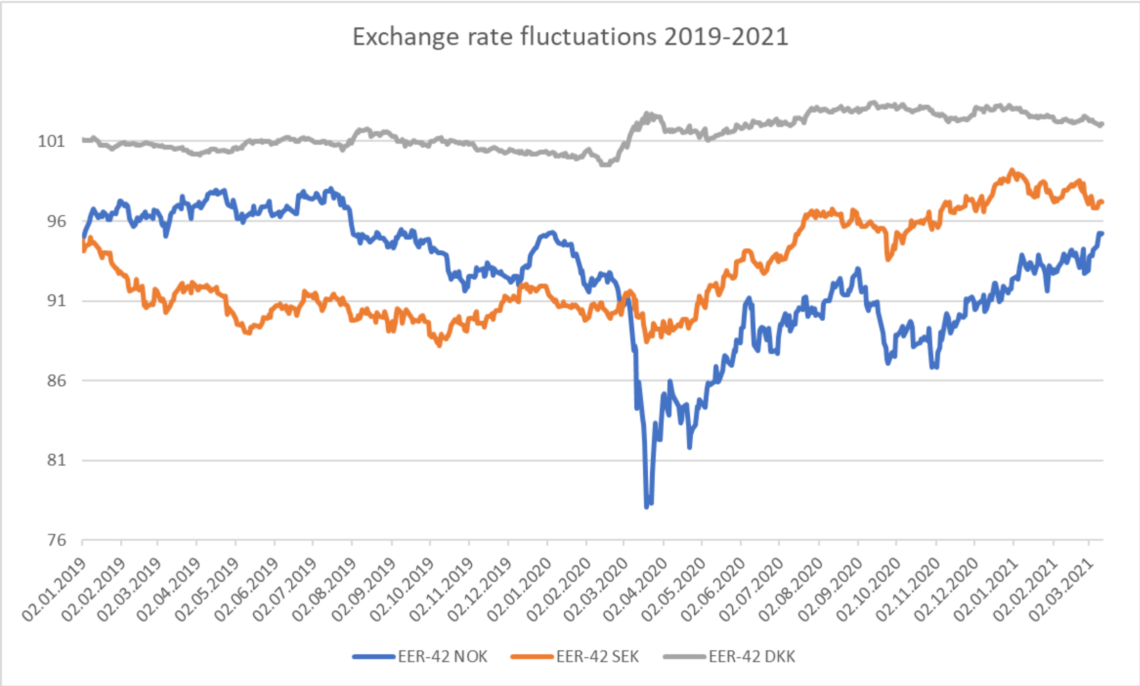
1. Introduction

The purpose of this study is to analyze the impact the Covid –19 pandemic has had on the currency exchange rates in Norway, Sweden, and Denmark. The three Nordic countries have much in common, but differ in their monetary policy, geopolitical position and the ways government responded to the growing spread of the virus. Although this is not the first virus the world has faced, several studies show that Covid-19 has had a severe effect on global economy comparing to pandemics before. (Hassan & Riveros Gavilanes , 2021) (Lee, Lee, & Wu, 2021).

We see this as a unique opportunity to be in the frontier and study the effect of the government response to the virus on the exchange rate. Currency exchange rate changes affect financial flows and investors` financial decisions. Understanding currency behavior and its drivers under such circumstances can be a useful tool for financial decision makers in terms of economic stability. Most business units develop cross-border business relationships by trading, developing conglomerates or departments in other countries, or investing. It means that with high fluctuation and unstable exchange rates, financial risk related to foreign currency increases.

Figure 1 shows currency movements during the period 2019-2021, measured by nominal exchange rate index based on percentage of international trade with 42 trading partners. NOK, DKK, and SEK seem to be more stable the year prior to the Covid-19 pandemic than the year when Covid-19 spread all over the world. During the pandemic Norwegian krone seems to weaken, exhibiting high volatility, while Swedish krona and Danish krone did not experience the same effect, with Danish krone showing least instability in terms of both exchange rate and volatility of all three of them. As shown in Figure 1, currencies have quickly recovered from the sudden drop in March-April 2020 back to “before” Covid-19 spread values. This is especially noticeable for Norwegian krone, that dropped approximately 15-20%, when Norway announced complete lockdown. Norwegian krone experienced much higher depreciation, in comparison to Danish krone and Swedish krona.

Figure 1 Exchange rate of Norwegian krone, Swedish Krona and Danish Krone



Notes: Figure 1 show currency exchange rate in the period during the pandemics and the year before. Currency movements are estimated using nominal effective exchange rate index EER-42 in the period 2019-2021, (ECB Statistics bulletin, 2020)

To understand this behavior, we also need to analyze other factors that could possibly explain currency movements in these countries during Covid-19 pandemic. We use several theories and empirical studies to control for other factors that may explain currency depreciation.

According to the studies in this field, currency value in the period excluding economic shocks may be partially explained by such factors as: the interest rate differential between domestic and foreign currency interest rates (Fama, 1984), global market volatility and movements in the stock market (Liang , 2012), (Bergvall, 2005). Economic shocks affect the global economy and currency exchange rate, as an important element of the economy.

The formal research question of this Master Thesis is: Has the government response to Covid-19 affected currency exchange rates in Denmark, Sweden, and Norway? If it has, is the effect similar for all three countries?

To measure the effect, we have chosen a dataset from Oxford university that recorded measures taken by the governments in different countries to slow down the spread of the virus. (Blavatnik School of Government, University of Oxford, Radcliffe Observatory Quarte, 2021). These measures were then calculated into several indices: stringency index, containment and health index, economic support index, and government response index. We are going to focus on government response index (GRI), as it involves the highest number of indicators. We will also look at other indexes to identify the specific measures that had impact on currency exchange rate. A dataset is a result of the project conducted by Oxford university and Blavatnik school of Government, that is called "Covid-19 tracker".

To estimate currency exchange rate we have tried 3 bilateral models of the most traded currencies in the world (Economics, 2020), and nominal exchange rate index of 42 international trading partners for Norway, Denmark and Sweden EER-42 (ECB Statistics bulletin, 2020).

To distinguish the effect of the government response we have chosen factors that affect currency exchange rate in the long run, described in empirical studies and theories in this scientific field. These factors are interest rate differential, Global market volatility, stock market, and oil price (for Norway only).

Random walk theory states that we cannot predict currency movements (Engel, West, & Mark, 2007), (Cheung, Chinn, Pascual, & Zhang, 2019). We believe, however, that understanding FX (foreign exchange) market response to economic shocks may help investors and business units to mitigate the FX risk exposure to some extent.

Recent studies find that there has been a negative impact on global economies around the world because of national lockdowns (Hassan & Riveros Gavilanes , 2021), (Lee, Lee, & Wu, 2021). Our findings indicate that the way governments respond to Covid-19 in all three countries is a significant factor in the domestic currency exchange rate. Our study shows that government actions lead to currency depreciation in all three countries. Moreover, the effect is more certain in Norway than in Denmark and Sweden.

2. Literature and theory

In this section we will focus on the global market behavior under the spread of Covid-19 and theories behind the exchange rate determinants, as well as to introduce the ratiocination behind the measure for Covid-19 variable.

We will start with the description of characteristic traits for Norway, Sweden and Denmark, their monetary policies, and cultural and social background. We need to account for specifics of the countries to understand the possible factors affecting currency exchange rate during the Covid-19 pandemic. Further, we will present literature overview over the global economy reaction to the spread of Covid-19 and measure for the government response to the spread of the Covid-19 virus. We will also look at the other factors that are empirically shown to affect currency exchange rate.

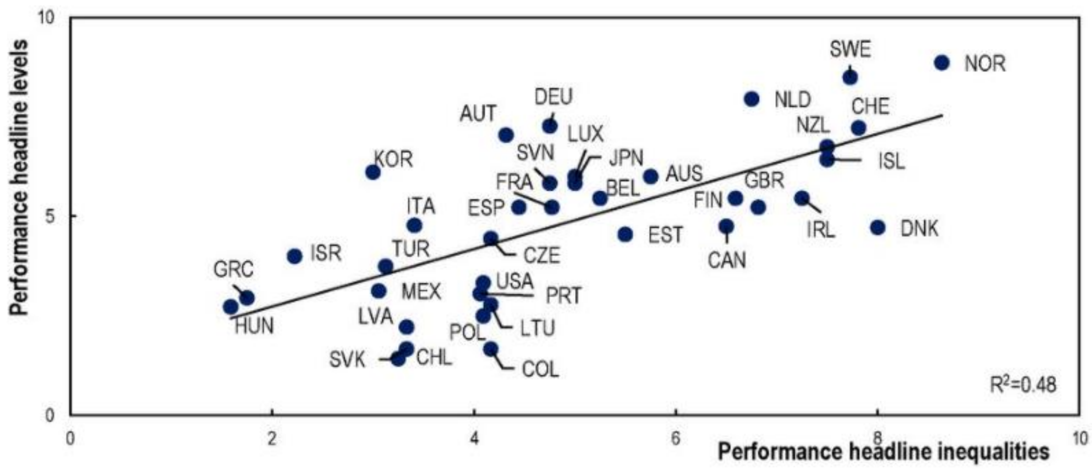
2.1. Characteristic traits of Nordic countries

Norway, Sweden, and Denmark are culturally, socially, and linguistically related, and have, historically, always interacted with one another. The countries also have close economic bonds and show similar economic and innovation trends (Lugaro, 2018).

They share the free- market economic model combined with a high level of welfare benefits. The Nordic region has had a strong technological development during the last 10 years, reaching the highest number of software companies per capita in Europe. Moreover, Norway, Sweden, and Denmark are the countries with top 20 GDP per Capita globally, with upward trending (The World Bank Group, 2021).

According to a recent OECD report, all three countries show high levels of well-being and social equality, see Figure 2 (OECD Publishing, 2020).

Figure 2 Level of well-being and equality in Norway, Denmark and Sweden



Also, other OECD measurements of economic, political, and social development during the last 10 years place Norway, Sweden, and Denmark close to each other.

While there are many similarities among the countries, there are traits that are unique for each of them. Norway is outside the EU but is a member state of EFTA (European Free Trade Association) and a part of the EEA (European Economic Area). Both Denmark and Sweden are members of the European Union but are not in the eurozone. Sweden and Norway maintain the floating exchange rate regime (Berg & Grøttheim, 2017), while Denmark has fixed exchange rate policy, keeping Danish krone stable against the euro, following ERM 2 (Exchange rate Mechanism) (Danmarks Nationalbank, 2017).

Fixed exchange rate policy is pursued by the government to maintain economic stability no matter what, while floating exchange rate policy allows the currency to fluctuate along with the foreign exchange market. Bergvall (2005) shows that monetary policy has an impact on macroeconomic stability. Klein and Shambaugh (2009) points out that fixed exchange rate regime contributes to a lower exchange rate volatility. At the same time, researchers emphasize that fixed rate creates an interdependence between the countries, that may lead to a more prominent consequences, if the "anchor" country changes interest rates (Klein, Shambaugh, & Klein, 2009). Economic and political stability as well as focus on innovation, renewable resources and technological development make Scandinavian region attractive for global investors.

2.2. Covid-19 effect on global economy and currency exchange rate

Christian Lie, a strategy expert from Danske bank, pointed out that Covid -19 pandemic might have a double shock on the stock market and global economy. First, the demand is reduced as consumers anxiety associated with the virus and uncertainty grows. Secondly, the restrictions that governments impose on their citizens and business units disrupt the normal supply chain of goods and services (Nilsen, 2020). Barro, Ursua and Weng (2020) find the evidence that the Covid-19 mortality rates are negatively associated with stock prices and GDP and positively associated with inflation, looking at worldwide patterns. Hassan and Riveros (2021) find a short-term connection between the stock market performance and the spread rate of Covid-19, observing the six first affected countries. At the same time his study shows that contamination rate does not explain changes in currency exchange rate or changes in major commodity prices. Financial reports from the March-April 2020 show that currencies were affected by the by the pandemic (Wen, 2020).

The news about the pandemic seems to have an impact on the volatility of the stock, according to several researchers of pandemic effects on the global economy (Baker, et al., 2020), (Janus, 2021). They point out that Covid -19 had more severe effect on the volatility of the stock prices compared to the previous infectious diseases. The volatility had its peak in March and descended slowly towards the end of March. The volatility remained high, compared to the pre Covid - 19 level.

Looking deeper in the aspects that triggered such a reaction the researchers pinpoint lethality and contingency of the virus as well as business closure, the scope of restricting policies, social distancing, disruption of cross-border supply chains and information supply as the main factors (Altig, et al., 2020). The researchers analyze the stock jumps against the news headlines and conclude that there is a powerful stock market effect of pandemic.

The volatility trend of the US stock exchange market as described by Baker is similar to the trend we can see in exchange rate volatility, see Figure 1. In comparison to the previous pandemics, like the Spanish flu in 1918, which only led to the modest economic fallout, the Covid -19 pandemic seems to have more severe impact on the global economy (Baker, et al., 2020).

2.3. Government response to Covid -19 as a currency exchange rate determinant

When Covid-19 started its spread towards Europe, a group of researchers (Hale, et al., 2021) started to collect the data trying to catch the scope of the pandemic to analyze the effect of governmental policies, such as school closing, travel restrictions, bans from public gatherings, emergency investments in healthcare facilities, contact tracing and managing the economic consequences of the restrictions. The data is known as "Oxford COVID-19 Government response tracker". It is a continuously updated dataset, that contains the information about the new policies that are introduced in particular country at a definite period of time as a response to the COVID-19 spread. As per today, the dataset includes 185 countries across the globe. The collection of data started on the 1st of January 2020. The data is publicly available and contains 20 indicators that are grouped in 3 categories (containment, economic response, health systems) plus one category for the observations that do not yet fall under other categories - miscellaneous.

As the research continued, the variables and structural changes in index composition were implemented. For example, the vaccination indicator was not implemented in the dataset before December 2020, as the policy itself did not exist. The dataset is designed for the researchers and policymakers to investigate the effect of the policies to the economic and social welfare. The policies are measured by the degree of severity of their reinforcement, and it is also taken into consideration if the policies are implemented in some regions or nationally. (Blavatnik School of Government, University of Oxford, Radcliffe Observatory Quarter, 2021). The data is updated daily.

The data (20 indicators) is also aggregated into 4 indices that reflect government measures and policies used to slow down the spread of the Covid-19 virus. These indices are: stringency index (SI) - that reflects the strictness of the lock down policies and public gatherings; containment and health index (CHI)- reflects public restrictions measures as well as governments investing in healthcare and vaccines; economic support index (ESI) - that reflects the measures taken to sustain the economic activity and help business units that have suffered because of the lock down and other governmental restrictions; and government response index (GRI) that reflects how the governments respond to the outbreak in terms of healthcare, economic support, restrictions on gatherings, lock down and so on.

We are going to use government response index (GRI) as it includes the biggest number of all measured parameters to observe the effect of the government actions in general. Further, we will look at the indexes with smaller number of indicators to see if any measures in particular affected currency exchange rate in the period.

Our anticipation is that there is an effect of government response on currency exchange rate in Norway, Sweden, and Denmark. We expect, however, a temporarily effect, because Covid-19 is a shock and, as illustrated in Figure 1, exchange rates seemed to recover rapidly after the Covid-19 shock back to the pre-Covid-19 levels. We also expect that the effect might vary among the countries as there is a variation in monetary policy and amount of the measures implemented by the governments. It is also difficult to predict if the effect leads to the currency appreciation or depreciation.

On the one hand, the strong intervention from the government`s side in terms of business closure, closed schools and limited social contact may lead to weaker economy, decrease in the stock market index, increasing unemployment rate, depreciating local currency. At the same time, the countries that respond strongly to the spread and maintain stability under the crisis may appear safer for the investor and this could lead to strengthening of domestic currency. The efforts like government loan guarantees, support packages for business units and individuals due to reduced activity under pandemic, tax reduction, capital injection in major branches should have positive effect on economy and currency exchange rate.

Another issue is the media effect on investors and the economic decisions. Some government actions were much spoken of by the international media, thus making an impression that this was a dominating measure. For example, Sweden did not have a lock down, and, because of that, the common perception is that Sweden did not respond as strongly as Denmark and Norway. The dataset, presented in this Master thesis, however, shows that Sweden implemented the strictest measures of all three countries in terms of the stringency index, the economic support index, see also 3.2.3, Figure 5. Some of these measures were restrictions on the international travels through Sweden, strengthening elderly care through training and bonus to the employees, compensation and support to individuals exposed to the consequences, state loan guarantee, digital doctors' appointments etc.

One more aspect is the consequences of implemented measures. Business units adapted quickly to the "new reality": home offices, online meetings, online studies, new digital solutions, new business activities are only a few of innovative solutions that were implemented during the pandemic. If government restrictions triggered innovations and thus, economic boost, this could have a positive effect on the exchange rate.

GRI (government response index) is complex in nature and contains several factors that can have both positive and negative effect on the currency exchange rate. Intuitively, containment measures would lead to depreciation, while economic support measures would positively affect the currency.

2.4. Exchange rate determinants

Several acknowledged theories and empirical studies explain currency depreciation by distinguishing significant factors affecting exchange rate. It is important to account for these factors to isolate the effect of government response to the Covid-19 pandemic on currency exchange rate. The classical and probably most known of these theories is Uncovered Interest Rate Parity (UIP).

2.4.1. Uncovered interest rate parity (UIP)

UIP states that relative difference in the short-term rates between the two countries equals relative change between exchange rates in those countries. According to this theory, once we understand the development of the short-term interest rate, we would be able to predict the foreign exchange rate. The theory assumes that the market is efficient.

Empirical studies show that there is a correlation between domestic interest rates and currencies. Fama (1984) analyzed nine major currencies and noticed the relationship between the forward and expected spot rate, by singling out the premium component. His study shows that the variance of the differential of forward and spot rate is bigger than the expected differential between future spot rate and spot rate. He also concludes that the differential between forward and spot rate at a definite period (t) is related to denominated interest rates of the two currencies. Forward rate premium component variation is significant, time – varying and is determined by the difference in the interest rates (Fama, 1984).

Bansal and Dahlquist (2000) conducted similar research for the countries with the emerging economies. Their study supported Fama`s results in terms that there is a strong relationship between expected change in the exchange rate and the interest rate differential, and macroeconomic fundamentals. They suggest further the bias of the interest rate differentials as GNP and inflation drop as typical features of emerging economies.

In 2018 Bussiere reexamined Fama`s research for the period after the financial crisis (Bussiere, Menzie, Ferrara, & Heipepertz, 2018). They found more supporting evidence in favor of UIP. They also found that correlation between the interest rate differential and the exchange rate is positive after financial crisis, while Fama`s research in 1984 showed that correlation was negative.

2.4.2. Random Walk

Many researchers state that, even though there are several plausible models explaining variation in exchange rates, their poor empirical performance questions both reliability and robustness. They highlight models' poor explanatory performance and argue that the random walk theory performs, in fact, better in predicting the exchange rates. Engel, West, and Mark (2007) prove that macroeconomic models are useful when predicting the future exchange rates on a long run. They conclude that if the FX risk premium is stationary, then models are able to give a better forecast than random walk. At the same time, they notice that models that fit well over some time period end up not to hold as the example extends. They also pose the idea that exchange rates react to such factors as people's expectations about the future.

Random walk theory does not present a plausible variable for our empirical model. Still, it is an important theory to consider when looking at how much variation is explained by the model we are going to construct.

2.4.3. Stock market as a currency exchange rate determinant

Stock market has empirically shown to affect the future exchange rates. Yang and Doong (2004) in the analysis of the spillover effects between the stock prices and the exchange rates have observed sensitivity of the latest to the global portfolio investments and the capital flows. Moreover, the study analyzing the spillover effect in Norway, Sweden, and Denmark, in the period from 2005-2018, showed that the effect of the stock market on currency exchange rate and exchange rate volatility in these countries is considerable. Nyhagen (2019) and Dengjun (2015) point out the strong correlation and interdependence among Nordic Stock markets. Ajayi and Mougoue (1996) have empirically shown that in the short run the increase of the stock price will have negative effect on the domestic currency value, while in the long run the effect will be positive. Hau and Rey (2005), through integrated analysis of exchange rates, equity prices and equity portfolio flows, points the codependence between the exchange rate and the stock market movements.

2.4.4. Export commodity as an exchange rate determinant

Several literature sources link the nominal exchange rate to commodity prices of the country's major export commodity (Ferraro, Rogoff, & Rossi, 2015). According to OEC data for 2018 the major exports for Sweden are Cars, Refined Petroleum and Packaged medicaments, for Denmark - packaged Medicaments, Refined Petroleum and food (pig meat), while Norway`s top export was Petroleum Gas, followed by Crude Petroleum and refined petroleum (The observatory of Economic Complexity (OEC), 2021). Although the database does not provide us with the data for a period this master thesis is focusing on, it still pinpoints the major exports of the countries of interest.

Chen and Rogoff (2003) show that there is a relationship between countries ‘major export commodity price movements in the global market and their exchange rate. This view is supported by Akram and Haroon (2016), showing that oil price shocks significantly increased the volatility of the macroeconomic variables in Norway. Almost 40% of Norway`s total export is crude oil, but Norway only stands for 2% of total global crude oil demand (Norsk Petroleum, 2020). Thus, the change in oil price in the global market may perform as a valid exogenous, terms-of-trade indicator for currency volatility in the countries where the oil products are a major export (Chen & Rogoff, 2003). Higher export commodity prices and increased export revenues in the short- run lead to appreciation of domestic currency of the exporting country. Akram (2019) points out the increase in the exchange rate of Norwegian krone as the oil price increases. At the same time, the strength of this relationship varies over time. The possible explanation to it could be the change in the demand and the supply curve, as well as other geopolitical uncertainties. One must consider the drivers of oil price while analyzing the relationship between them. Kohlscheen, Avalos and Schrimpf (2016) underline the link between the movements in the price of the major export commodity and the exchange rates of the exporter country. The also conclude that the export commodity price models outperform the random walk.

2.4.5. Portfolio rebalancing theory and implied volatility index

Capital and equity flows have increased dramatically during the last 2 decades and became an important determinant of the short-run supply and demand of foreign exchange balances. While numerous exchange rate literature sources point out currency order flow correlation with the exchange rate, Hau and Rey (2004) show that changes in the exchange rate may as well be a result of portfolio rebalancing effect as the domestic investors tend to sell the foreign assets and currency balances, when the currency appreciates. Rational investor would manage the portfolio according to its expected value. Engel, West, and Mark (2007) argue that people's expectations about the future fundamentals greatly affect the investment decisions and the exchange rate. Kohlscheen, Avalos and Schrimpf (2016) show that the variation in commodity prices can partly explain the variation in nominal exchange rate.

A part of variation in the exchange rate can also be explained by the global risk and links our thesis to risk premia and asset pricing. Lustig, Roussanov and Verdelhan (2008) show that currency risk premia can be explained by the global risk factor and accounting for this factor leaves no significant anomalous excess return.

In the last decade, the investor's identity has changed compared to decades ago, from highly educated and professional to regular person without deep knowledge of macroeconomic variables. As technological development advances, the possibilities to invest open for most investors. This new investor type gathers the information primarily from the internet and social media and may challenge the traditional understanding of rational investors.

3. Research methodology and data description

3.1. Data source and collection

The data is collected for the period from the 1st of January 2020 until the 12th of March 2021. Our empirical analysis is based on daily observations. Bilateral currency exchange rates for Norway, Sweden and Denmark (EURNOK, USDNOK, JPYNOK, EURSEK, USDSEK, JPYSEK, EURDKK, USDDKK and JPYDKK), Chicago board options Exchange (CBOE) volatility index (VIX), Ice Europe Brent Crude futures value, interest rates for Norway, Sweden and Denmark (Nibor, Stibor, Cibor, and Euribor) are collected from Refinitiv that is a global provider of financial data (Eikon, 2021). Libor interest rate for United States and Japan are collected from Federal Reserve Economic Data (Fred Economic Data, 2021). The nominal exchange rate index EER-42 for Norway, Sweden and Denmark are obtained from European Central bank Statistical warehouse (ECB Statistics bulletin, 2020). Government response index data is obtained from Oxford government Response tracker (OxCGRT) that is a project from Blavatnik school of Government (Blavatnik School of Government, University of Oxford, Radcliffe Observatory Quarter, 2021). The data collected is adjusted for the days with missing observations because of holidays and public events, to develop the dataset. GRI data and currency exchange rate data include all the dates, while stock exchange, global volatility indices, and interest rates proxies are country specific and exclude public holidays data. Missing observations is a common issue while conducting a research, but it may cause the inconsistent inference. (Blasques, Gorgi, & Koopman, 2021). Commonly used tool to deal with missing observations is to simply ignore the observation.

3.2. Model description

To estimate the relationship between government response to Covid -19 pandemic and changes in domestic currency value in Norway, Denmark, and Sweden we are going to perform regression analysis.

At first, we are going to construct 4 multiple linear regression models for each country, totally 12 models, that cover the period from the 1st of January 2020 to the 12th of March 2021. Our dataset for Government response starts on the 01.01.2020 and it is therefore a natural starting point for the analysis. Daily observations are used in the analysis. Our aim is to observe the effect of different factors and Government response (GRI) on the variation in currency exchange rate. There were no measures implemented in Norway, Denmark, or Sweden until the 30th of January, therefore GRI of the first 30 observations is 0. Further, we will test the effect of other indexes presented in the dataset, SI, CHI and ESI on currency exchange rate. We will use multiple factors that have been empirically shown to be significant for the specific country in addition to government response index (GRI). For each country of interest, we are going to build four models (index model and 3 bilateral currency models), including the factors that are relevant for the country.

The general form of the regression model is:

$y_t = \alpha_0 + \beta_i (x_{i,t}) + u_i$,

where $\Delta y_t = y_t - y_{t-1}$ is a dependent variable and represents daily change in the spot price of the exchange rate. For the Norwegian model, the dependent variable is represented by nominal exchange rate index (EER-42) for Norway and currency pairs- EURNOK, USDNOK and JPYNOK. For Swedish model the dependent variable is represented by nominal exchange rate index (EER-42) for Sweden and currency pairs- EURSEK, USDSEK and JPYSEK and for Danish model, the dependent variable is nominal exchange rate index (EER-42) for Denmark and currency pairs- EURDKK, USDDKK and JPYDKK.

$x_{i,t}$ - represents the explanatory variables that are different in each model and are:

- Daily interest rate differentials of the 3-month domestic interest rate, respectively Nibor, Cibor and Stibor and European 3 months interest rate Euribor for the regressions where explanatory variable is EER-42 and bilateral model with Euro. Euribor interest rate was chosen for EER-42 models because relative portion of international trade in Euro area prevailed in the index composition in all three countries. EER-42 is unique for every country, see also 3.2.2. For bilateral models with US dollar as exchange rate determinant, Libor (USD) interest rate is used, and for the model with Japanese yen as exchange rate determinant – Libor (JPY) interbank interest rate is used. Intertest rate differential, ($i_{home\ country}$-$i_{foreign\ currency}$), in every model will be denoted as ($i_{diff,t}$). The variable is chosen based on the UIP theory, ref. 2.4.1, stating that interest rate differential is statistically significant in explaining variation in currency value, especially in the short run (Fama, 1984).

- Daily stock market benchmark index. For Norway we have chosen OSEBX (Oslo exchange benchmark index) that is a proxy for performance of Oslo stock exchange, for Denmark – OMXC20 (OMX Copenhagen 20) that includes 20 actively traded shares on Copenhagen stock exchange and is a proxy for stock market value in Denmark, and for Sweden -OMXS30 (Stockholm Stock exchange's leading share index that consists of 30 most traded shares and is a proxy for Swedish stock exchange). The variable is chosen as it is empirically shown through several studies to be significant factor in currency value determination, ref. 2.4.3 (Hau & Rey, 2005).

- VIX, CBOE Market volatility index, measures market volatility based on the investors' expectations of 3 month forward looking volatility. The index is based on the S&P 500 index options. This is the third variable in our models. This is the only variable that is equal for all three countries. Chicago board options Exchange (CBOE) volatility index (VIX) is considered to suit as a proxy for measuring the global risk in the recent studies (Lustig, Roussanov, & Verdelhan, 2008), (Farhi & Gabaix, 2016).

- For the Norwegian model we add one more variable, (Oil), that is a benchmark for the oil price for the North Sea oil, as it is the main export factor and is shown through several studies to be significant in explaining depreciation of Norwegian Krone, ref 2.4.4, (Chen & Rogoff, 2003) (The observatory of Economic Complexity (OEC), 2021). This variable is only used in Norwegian regression model as it is less relevant for the other countries. We use ICE Europe Brent Crude Electronic Energy Future as a proxy and denote it as OIL in our analysis.

- The last variable is government response index calculated by the Oxford university researchers, GRI.

α_0 - is an intercept and constant term, β_i estimates the slope for each of the above-mentioned explanatory variables and measures the change in the explained variable with respect to the explanatory variables, and u_i – denotes the error term and stands for other factors that are not explained by the model. We test whether the variables have a significant effect on currency price during Covid-19 pandemic, covering period from 01.01.20-12.03.21.

The following regression models are built for respectively Norway, Sweden, and Denmark:

Norway regression:

Equation 1

$$EER\text{-}42_{NOK,t} = \alpha_0 + \beta_1(idiff_{(Nibor-Euribor),t}) + \beta_2(OSEBX_t) + \beta_3(Oil_t) + \beta_4(VIX_t) + \beta_5(GRI_t) + u_{NOK,t}$$

Equation 2

$$EURNOK_{,t} = \alpha_0 + \beta_1(idiff_{(Nibor-Euribor),t}) + \beta_2(OSEBX_t) + \beta_3(Oil_t) + \beta_4(VIX_t) + \beta_5(GRI_t) + u_{NOK,t}$$

Equation 3

$$USDNOK_{,t} = \alpha_0 + \beta_1(idiff_{(Nibor-Libor\,(USD)),t}) + \beta_2(OSEBX_t) + \beta_3(Oil_t) + \beta_4(VIX_t) + \beta_5(GRI_t) + u_{NOK,t}$$

Equation 4

JPYNOK$_{,t}$ = α_0 +β_1(idiff$_{(Nibor-Libor\ (JPY),t}$) +β_2(OSEBX$_t$) + β_3(Oil$_t$) + β_4(VIX$_t$) + β_5(GRI$_t$) +$u_{NOK,t}$

<u>Sweden regression</u>:

Equation 5

EER -42 $_{SEK,t}$ = α_0 +β_1((idiff$_{(Stibor-Euribor),t}$) +β_2(OMXS30$_t$) + β_3(VIX$_t$) + β_4(GRI$_t$) +$u_{SEK,t}$

Equation 6

EURSEK$_{,t}$ = α_0 +β_1((idiff$_{(Stibor-Euribor),t}$) + β_2(OMXS30$_t$) + β_3(VIX$_t$) + β_4(GRI$_t$) +$u_{SEK,t}$

Equation 7

USDSEK$_{,t}$ = α_0 +β_1((idiff$_{(Stibor-Libor(USD),t}$) + β_2(OMXS30$_t$) + β_3(VIX$_t$) + β_4(GRI$_t$) +$u_{SEK,t}$

Equation 8

JPYSEK$_{,t}$ = α_0 +β_1((idiff$_{(Stibor-Libor(JPY),t}$) + β_2(OMXS30$_t$) + β_3(VIX$_t$) + β_4(GRI$_t$) +$u_{SEK,t}$

<u>Denmark regression</u>:

Equation 9

EER -42 $_{DKK,t}$ = α_0 +β_1((idiff$_{(Cibor-Euribor),t}$) +β_2(OMXC20) + β_3(VIX$_t$) + β_4(GRI$_t$) +$u_{SEK,t}$

Equation 10

EURDKK$_{,t}$ = α_0 +β_1((idiff$_{(Cibor-Euribor),t}$) + β_2(OMXC20) + β_3(VIX$_t$) + β_4(GRI$_t$) +$u_{SEK,t}$

Equation 11

USDDKK$_{,t}$ = α_0 +β_1((idiff$_{(Cibor-Libor(USD),t}$) + β_2(OMXC20) + β_3(VIX$_t$) + β_4(GRI$_t$) +$u_{SEK,t}$

Equation 12

JPYDKK$_{,t}$ = α_0 +β_1((idiff$_{(Cibor-Libor(JPY),t}$) + β_2(OMXC20) + β_3(VIX$_t$) + β_4(GRI$_t$)+$u_{SEK,t}$

The only variable that is common for all regressions is global volatility index VIX as it does not refer to a particular country, but to the global fluctuations in the market.

Multiple linear regressions are considered to be a suitable econometric tool for analyzing the exposure of the regressand to multiple factors that affect this variable simultaneously.

The multiple regression model is based on the following assumptions (Wooldridge, 2015):

- The relationship between the dependent and explanatory variable are linear in parameters.
- Independent variables are not perfectly correlated with each other.
- The unobserved term, *u*, is uncorrelated with the independent variables.

Coefficients (betas) will show the effect 1% change in the explanatory variables has on the explained variable. After estimating the coefficients, we are going to test them for the significance using T-statistics and F-statistics.

By including variables that have been proven statistically significant in previous studies we control for these factors. We investigate the significance of Covid -19 government response index in the change of currency exchange rate.

3.2.1. Currency exchange rate measure

Currency exchange rate measured as currency pairs provides only information about bilateral movements between two currencies.

To find a good estimate for currency exchange rate we use several bilateral exchange rates between domestic currency of Norway, Sweden, and Denmark against most traded currencies in the modern economy, United States dollar, Euro and Japanese yen. (Quiz, 2020). Another measure of the currency price is effective exchange rates indexes (EERs) based on cost and price trends, as well as exchange rates. Nominal effective exchange rate (NEER) is calculated by European Central bank (ECB) using geometrically weighted averages of nominal bilateral rates between the currency and a basket of foreign currencies of selected trading partners (European Central Bank, 2021). It represents a currency`s external value. Real exchange rate index is nominal index, adjusted for relative cost and price level, through consumer price index (CPI), producer price index (PPI) and GPD deflators.

In this study we are using nominal exchange rate index, EER -42 that denotes domestic currency exchange rate against 42 trading partners in addition to euro area. Weights in the index represent the relative percentage of international trade (import and export) of goods and services, see Appendix B.

According to the EER-42 index, revised in 2020, Euro area is assigned the largest weight as a trading partner relative to other countries in the index for all three countries. (We are using Euribor rate in constructing rate differential variable, as the prevailing relative weight in the index is for the euro area).

The index follows domestic currency movements. Upward movement of the EER-42 index reflects strengthening of the domestic currency and vice versa.

One advantage of using index instead of single currency is the diminishing effect of single currency individual impact.

3.2.2. Interest rate differential measure

Ibor rates are a common proxy for interest rates in the respective countries. IBORS – Inter Bank Offered Rates represent an average interbank short- term interest rate. They involve two elements: expected short term rate and risk premium. The first factor is closely connected to the central banks` monetary policy and makes is a suitable proxy for the domestic interest rate variable, since it reflects the interest banks require to lend the domestic currency to another bank. For Norway, such interest rate is Nibor – Norwegian Interbank Offered Rate, for Sweden – Stibor (Swedish Interbank Offered Rate) and for Denmark (Danish Interbank Offered Rate) is Cibor. The foreign interest rate in EURNOK model is Euribor, as it represents the Euro area interest rate (Kloster & Syrstad, 2019).

For the exchange rate differential between the domestic currency and the United States Dollar we will use the USD Libor rate as a proxy for the foreign interest rate, and for the JPYNOK we are going to use JPY Libor. We will use interest rate differential between domestic "ibor" and Euribor for our index model (EER-42), because Euro area is the international trading partner with the biggest weight for all three countries. Relative weight for Norway is 31,61%, for Denmark – 36,81% and for Sweden - 42,95%. Euribor will also be used in the bilateral EURNOK regression.

3.2.3. GRI composition and calculation

GRI (governments response index) is based on the data collected as a joint project of researchers from Blavatnik school of government and University of Oxford of Covid- 19 measures implied by the governments in different countries. (Blavatnik School of Government, University of Oxford, Radcliffe Observatory Quarter, 2021). Per the date the data was collected (the 12th of March) there existed 4 categories:

1. Containment and closure (C- category, includes 8 indicators)
2. Economic response (E -category, includes 4 indicators)
3. Health systems (H-category, includes 8 indicators)
4. Miscellaneous (stands for other interventions that do not go under other three categories)

Containment and closure category includes measures that are implemented to limit the social interaction between people. These measures are school closing, workplace closing, cancelling of public events, restrictions on gathering size, close of public transport, restriction on internal movements and restrictions on international travel.

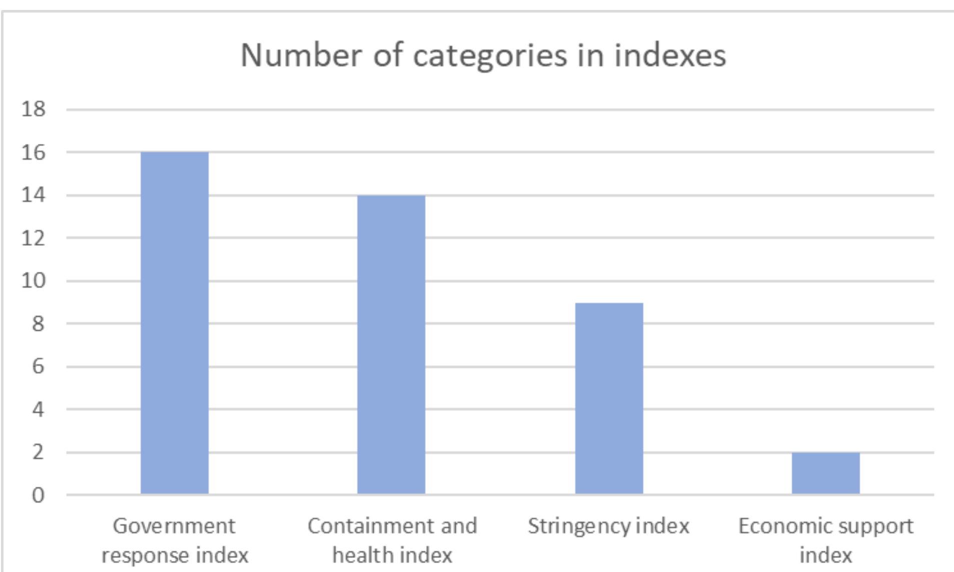
Economic response category describes the economic measures the governments imply to help the individuals and business units to cope with the restrictions. This category includes such measures as income support, debt or contract relief for households, fiscal measures, and international support.

Health system category consists of such subcategories as: public information campaign, testing policy, contact tracing, emergency investment in health care, investment in Covid-19 vaccines, facial coverings, vaccination policy and protecting elderly people.

Each category is given a numerical ordinal equivalent that measures the strictness of policies, on the scale from 0-3 or 4, where zero stands for no measures implemented. Such categories as fiscal measures, international support, as well as emergency investments in health care and vaccines are measured according to their numerical value, but for the time being they are not included in the index. All the measures are given extra "strictness" if the policies are implemented nationally. It uses simple, additive unweighted indices as the baseline measure. There is also added the additional binary variable "flag" that indicates whether the measures are implemented regionally or nationally, for E1, the flag stands for whether the sectoral support was implemented and for H7- whether the government covers the cost of vaccines (Hale, et al., 2021).

The data (20 indicators) is also aggregated into 4 indices that reflect government measures and policies used to limit or slow down the spread of Covid-19 virus. Each index contains one or more categories. Figure 3 demonstrates the number of indicators in each index.

Figure 3 Covid-19 response indexes



- Government response index (GRI), that includes 16 indicators and reflects how the governments respond to the outbreak in terms of healthcare, economic support, restrictions on gatherings, lock down and so on. This index includes the biggest number of the indicators and changes as the measures become weaker or stronger.

- Containment and health index (CHI), includes 14 indicators and contains public restrictions measures as well as governments` investing in healthcare and vaccines.
- Stringency index, (SI), includes 9 indicators that reflect the strictness of the lock down policies and public gatherings.
- Economic support index, (ESI), reflects the measures that are taken to sustain the economic activity and help the business units that have suffered because of the lock down and other governmental restrictions. The index includes only 2 parameters per the day the data for this research was collected.
- Legacy stringency index refers to the first version of Government response tracker dataset that was in use until the 28-th of April 2020 and contained 7 indicators from different categories. The records that were collected before the 28 of April were kept but renamed and used in the new dataset.

Table 1 Indexes composition

Category abreviation	Index name -> Category name	Government response indexGRI)	Containment and health index (CH)	Stringency index (SI)	Economic support index (ES)	Legacy stringency index	Type of data	Targeted/ General
	K	16	14	9	2	7		
C1	School closing	x	x	x		x	Ordinal	Geographic
C2	Workplace closing	x	x	x		x	Ordinal	Geographic
C3	Cancel public events	x	x	x		?	Ordinal	Geographic
C4	Restrictions on gathering size	x	x	x		?	Ordinal	Geographic
C5	Close public transport	x	x	x		x	Ordinal	Geographic
C6	Stay at home requirement	x	x	x		?	Ordinal	Geographic
C7	Restrictions on internal movement	x	x	x		?	Ordinal	Geographic
C8	Restrictions on international travel	x	x	x		x	Ordinal	Geographic
E1	Income support	x			x		Ordinal	Sectoral
E2	Debt/contract relief og households	x			x		Ordinal	
E3	Fiscal measures						Numeric	
E4	Giving international support						Numeric	
H1	Public information campaign	x	x	x		x	Ordinal	Geographic
H2	Testing policy	x	x				Ordinal	

H3	Contact tracing	x	x				Ordinal	
H4	Emergency investment in healthcare						Numeric	
H5	Investment in COVID-19						Numeric	
H6	Facial coverings	x	x				Ordinal	Geographic
H7	Vaccination Policy	x	x				Ordinal	Cost
H8	Protection of elderly people	x	x				Ordinal	Geographic
M1	Other responces						Free text	

Each indicator is categorized according to the strictness of measures that are implied, where 0 – is no policy applied at all, while the highest score indicates most extensive measures as illustrated in Table 2.

Indicators E3, E4, H4, H5 and M1 have numeric or free text value and are not included in the index calculation. The last column in the table above indicates if the measure was "sectoral"-applied in a specific area of the country, or the measure applied for the whole country. For the indicator H7 – "cost" indicates if the vaccine policy is funded by the government or at a cost of individual. If the measures are applied for the whole country and vaccine is funded by the government, the respective indicator gets binary score of 1 and if not – binary score of zero. Score 1 is valued higher than score zero.

Table 2 Indicators values

Indicator	Max. value (N_j)	Targeted (F_j)
C1	3 (0, 1, 2, 3)	yes=1
C2	3 (0, 1, 2, 3)	yes=1
C3	2 (0, 1, 2)	yes=1
C4	4 (0, 1, 2, 3, 4)	yes=1
C5	2 (0, 1, 2)	yes=1
C6	3 (0, 1, 2, 3)	yes=1
C7	2 (0, 1, 2)	yes=1
C8	4 (0, 1, 2, 3, 4)	no=0
E1	2 (0, 1, 2)	yes=1
E2	2 (0, 1, 2)	no=0
H1	2 (0, 1, 2)	yes=1
H2	3 (0, 1, 2, 3)	no=0
H3	2 (0, 1, 2)	no=0
H6	4 (0, 1, 2, 3, 4)	yes=1
H7	5 (0, 1, 2, 3, 4, 5)	yes=1
H8	3 (0, 1, 2, 3)	yes=1

Table 2 shows the maximum value the indicator can have to calculate indexes. Miscellaneous category is not yet given a numerical value and it is not included in calculations of index. As shown in Table 1, type of data is free text.

The indexes are calculated as follows:

$$Index = \frac{1}{k}\sum_{j=1}^{k} I_j,$$

Where $\boldsymbol{k}$ indicates the indicator (C1-M1), $\mathbf{I_j}$ – is a subindex score. The sub-index scores are calculated using the following formula:

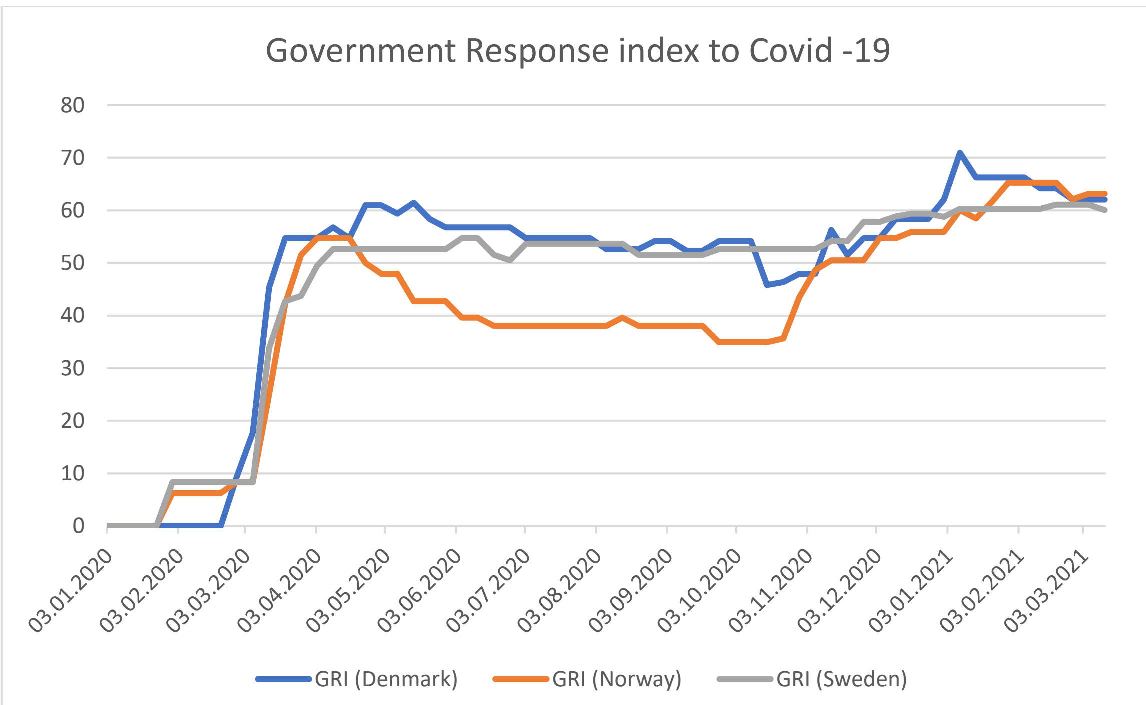
$$I_{j,t}=100\frac{v_{j,t-}0{,}5(F_j-f_{j,t})}{N_j},$$

where ***v***- is the value of strictness policy based on the collected data, ***F***- is a binal score, indicating that the indicator is given a limitation scope, ***f*** – indicates the limitation scope itself. Basically, if F equals zero, then f is zero, but if F equals 1, then f- may be equal zero or one. ***N*** is a number of indicators in index.

Data gaps are being dealt with by replacing the missing data with the last available acceptable data point. (Blavatnik School of Government, University of Oxford, Radcliffe Observatory Quarter, 2021)

The index is calculated based on the measurements imposed by the governments in the Nordic countries: Norway, Sweden, and Denmark.

Figure 4 Government response index for the Covid – 19 pandemic

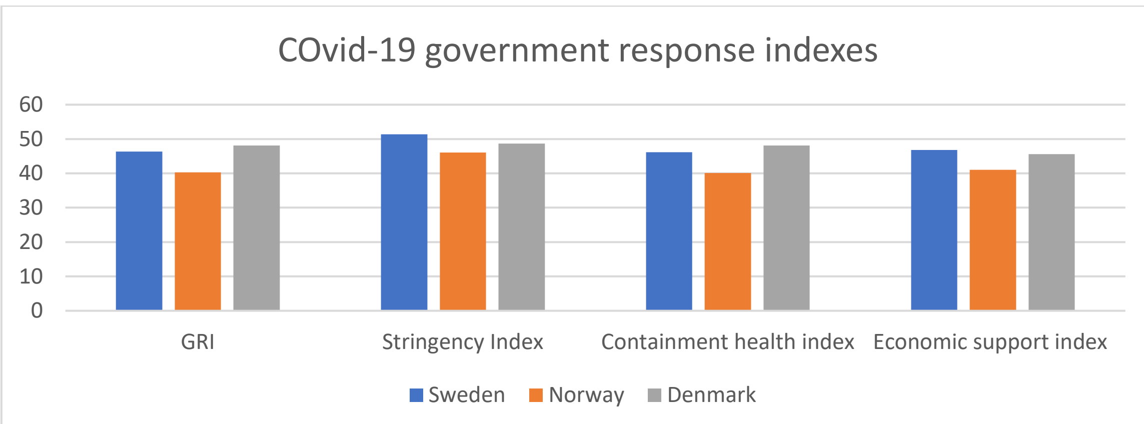


Notes: the dataset contains daily observations of the government response to the spread of COVID-19 for the period 01.01.2020-12.03.2021, in Norway, Denmark and Sweden with total of 437 observation.

Figure 4 illustrates the total amount of measures the governments apply in response to the pandemic, expressed by GRI. It shows that Norway implemented approximately as strong actions as Denmark in the beginning of March 2021. During summer 2020 Norway reduced government`s response, while both Denmark and Sweden maintained the measures during the whole period of our study.

Figure 5 shows all the indexes presented in the dataset. Norway scores lowest in implementing all indexes as compared to Denmark and Sweden.

Figure 5 Government response indexes in Norway, Sweden and Norway



There is a certain risk regarding the data quality of the dataset that we use in our research, because, to the best of our knowledge, there is, yet no completed research based on this data indicating that GRI is a good indicator for consequences of Covid -19 (Oxford University, 2021), see Appendix D for complete dataset for government response indexes.

3.2.4. Stationarity

When working with time series analysis one must be cautious as most of the time series data exhibit non-stationarity. This implies that the probability distribution of the variables varies over the time.

When trying to understand the relationship between the dependent and explanatory variables using regression models, we need to assume a stochastic, stable process over the time, where series of random variables are ordered in time (Wooldridge, 2015). If the variables that are used in the research exhibit non-stationarity, we can`t trust the results, R^2 in the regression model will be pseudo high with false significant variables. Non-stationary variables exhibit trending, increasing variance, seasonality and changing the levels. (Palachy, 2019)

Non-stationarity in variables may be observed through visualization, Autocorrelation Function (ACF (plots) and parametric tests, see Appendix C and Appendix A. In this master thesis we have used parametric unit root test – Augmented Dickey – Fuller (ADF). The results of the Augmented Dickey- Fuller test support visual results and show that almost all our variables exhibit non-stationarity and need to be transformed to be useful for our analysis. Commonly used transformation form is natural logarithm or usage of the first difference.

$\log(y_t) = \beta_0 + \beta_1 \log(x_1) + u,$

The proportionate change in the variables equals the change in the natural logarithm of the variable if the changes are small.

$\log(y_t) - \log(y_{t-1}) = \Delta\log(y_t) \approx y_t/y_{t-1} - 1$

4. Empirical Analysis

Empirical analysis involves period from the 1st of January 2020 to the 12th of March 2021, when the researchers of Blavatnik school of Economics began to collect the worldwide data about the response to the spread of the virus by governments worldwide.

4.1. Norwegian Krone

The total number of observations made in the period 01.01.2020-12.03.2021 is 313 and the total number of unique missing observation in one of the variables is 25, that is approximately 7 % of the observations. The number of observations after the excluding missing variables varies for different countries, because of the country-specific variables.

Table 3 Descriptive Statistics for price impact regression for Norway

	Average	*SD*	*Kurt*	*Skew.*	*Nr. of obs*	*ADF test t-statistics*
EER-42 $_{N,t}$	90.0443	3.3341	0.8631	-0.9426	287	-1.6561
$Idiff_{euribor,t}$	-0.0026	0.0267	15.0652	-2.5934	287	-0.5342
$USDNOK_t$	-0.0001	0.0113	10.8570	1.6877	287	-1.4471
$Idiff_{libor\ USD,t}$	-0.3231	3.5235	208.7436	-13.4906	287	-3.7823*
$JPYNOK_t$	0.0002	0.0128	4.9852	-0.7240	287	-1.2000
$Idiff_{libor\ JPY,t}$	-0.0038	0.0383	16.7981	-2.2724	287	-0.5029
$EURNOK_t$	0.0001	0.0101	12.3626	2.1322	287	-1.6297
$OSEBX_t$	0.0006	0.0163	5.8050	-1.1999	287	-1.307
VIX_t	0.0041	0.1014	9.3693	2.3339	287	-2.2019
Oil_t	0.0000	0.0360	4.6600	-0.3223	287	-0.15471
GRI_t	0.0098	0.0676	90.4480	8.5391	287	-2.0507

Note: *p<0.1; **p<0.05; ***p<0.01

Notes: The table shows the descriptive statistics for the exchange rate of Norwegian krone, expressed by nominal effective exchange rate index EER-42$_t$, USDNOK$_t$, EURNOK$_t$, JPYNOK$_t$. Idiff$_t$ variable denotes interest rate differential between domestic interest rate Nibor, and European 3 months interest rate Euribor, and interest rate differential between domestic interest rate Nibor and Libor (USD) rate, interest rate differential between domestic interest rate Nibor and Libor JPY, and Stock market index for Norway (OSEBX$_t$). The other variables are Oil$_t$, expressed by daily relative change in USD-denominated Brent oil Price, Chicago board options Exchange volatility index (VIX) and government response index (GRI$_t$). EER-42$_t$ is represented as level value, other values are represented as first differences. The critical value for the ADF test is – 3.4327. The sample period is 01.01.2020-12.03.2021 and contains 287 daily observations.

Table 4 Exchange rate price impact regression Norwegian krone

	EER-42	USDNOK	EURNOK	JPYNOK
α	0.0001	-0.0003	-0.0001	0.0003
	(0.0004)	(0.001)	(0.001)	(0.001)
$I_{diff,t}$	0.002	-0.0002	-0.082***	0.031
	(0.016)	(0.0002)	(0.022)	(0.0200)
sm_t	0.207***	0.055	0.03	-0.005
	(0.031)	(0.049)	(0.043)	(0.055)
vix_t	-0.001	-0.003	-0.0001	-0.001
	(0.004)	(0.007)	(0.006)	(0.007)
oil_t	0.018	-0.014	-0.026	0.03
	(0.013)	(0.021)	(0.018)	(0.024)
gri_t	-0.014**	0.01	0.00003	0.001
	(0.007)	(0.011)	(0.009)	(0.012)
Observations	287	287	287	287
R2	0.249	0.012	0.057	0.015
Adjusted R2	0.236	-0.006	0.04	-0.002
Residual Std. Error (df =281)	0.007	0.011	0.01	0.013
F Statistic (df = 5; 281)	18.677***	0.679	3.389***	0.866
Note:	*p<0.1;	**p<0.05;	***p<0.01	

Notes: The exchange rate regression table contains 287 daily observations for the period 01.01.2020-12.03.2021. $I_{diff,t}$ variable denotes interest rate differential between the domestic interest rate Nibor, and European 3 months interest rate Euribor, and interest rate differential between domestic interest rate Nibor and Libor (USD) rate, interest rate differential between domestic interest rate Nibor and Libor JPY.). The other variables are the stock market index (sm_t) for Norway ($OSEBX_t$), oil_t, expressed by daily relative change in USD-denominated Brent oil Price, Chicago board options Exchange volatility index (vix_t) and government response index (gri_t). The F-statistics refers to the joint null hypothesis.

Regression with the nominal exchange rate index for Norwegian krone has considerably high adjusted R2 in the model. 23,6% of the variation in the exchange rate of Norwegian krone is explained by our model, when the price estimator is EER-42 index. In USD, EUR and JPY bilateral models, R2 adjusted is respectively, -0,6%, 4% and – 0,2%. Bilateral models seem to have poor explanatory power of exchange rate depreciation of Norwegian krone. According to EER-42 composition Euro area stands for 31,6% of total, United States – for 7,82% and Japan for 2,06% of international trade. We see that explanatory power of the model diminishes, respectively.

The interest rate differential between domestic and foreign currency statistically equals zero in the EER-42 model. Th UIP does not hold for the regression. This can be explained by the fact that UIP refers to bilateral relationship between currencies, rather than index. One more aspect is that we study the period of economic shock, while UIP refers to "normal economic periods", not involving economic shocks. EURNOK model points out the interest rate differential as the only significant variable in the model. The interest rate differential is significant at 1% level in this model and suggests that the increase in the interest rate differential by 1 percent is associated with NOK appreciation by 8.2%. This finding is in line with UIP theory.

The stock market index represented by OSEBX appears to be significant at 5% level in the EER-42 model. The effect is strong and implies that 1 % increase in OSEBX index leads to 20,7% increase exchange rate in the given period. This is consistent with the earlier findings (Yang & Doong, 2004) that movements in the stock market affect the exchange rate. However, the variable is not significant in currency pair models. Possible explanation is that index reflects the relationship between stock market and exchange rates better.

Global volatility as well as the oil price are not significant in either index model or bilateral models. This is not consistent with the empirical studies about the influence of the country`s major export commodity and currency risk premia and portfolio returns. Possible explanation could be that the significance of the price of the main export commodity is more observable in the long run (Chen & Rogoff, 2003). Another explanation is that macroeconomic variables may behave differently under the period of economic shocks.

Government response index is significant at 5% level in the EER-42 model with a negative coefficient. It suggests that (holding all the other variables fixed), as the government imposes more measures, the Norwegian currency tends to depreciate by 1,4%. Our expectations were that Government response to Covid-19 would influence the currency, because of its intensive intrusion in the economic activity of the country. The sign of the coefficient is interesting and difficult to predict, because GRI index contains both restrictive and business supportive actions. The regression shows that in general government intervention has negatively affected NOK. We will get a closer look at what measures (restrictive, health or economic) influence exchange rates in our analysis of indexes with fewer indicators.

4.2. Danish Krone

The analysis is based on 288 observations. The same method is used to obtain the observations for the regression as in previous analysis.

Table 5 Descriptive Statistics for price impact regression for Denmark

	Average	*SD*	*Kurt*	*Skew*	*Nr. of obs*	*ADF test t-statistics*
EER-42 $_{D,t}$	111.4967	1.6809	0.0971	-1.0757	288	-1.9763
$EURDKK_t$	0.0000	0.0002	4.7434	0.0220	288	-2.1585
$USDDKK_t$	-0.0002	0.0048	1.6843	0.3029	288	-2.1031
$JPYDKK_t$	0.0003	0.0050	2.0695	0.5842	288	-2.1824
$Idiff_{euribor,t}$	0.0010	1.5091	108.6324	-1.9834	288	-2.6162
$Idiff_{libod\ USD,t}$	-0.0070	0.0425	5.7936	-0.5906	288	-1.1596
$Idiff_{libor\ JPY,t}$	-0.0017	0.0590	17.4863	-1.7303	288	-2.1153
$OMXC20_t$	0.0010	0.0139	3.1746	-0.6772	288	-2.9452
VIX_t	0.0041	0.1013	9.3919	2.3351	288	-2.1937
GRI_t	0.0078	0.0541	54.5637	6.5045	288	-1.4143

Notes: The table shows the descriptive statistics for the exchange rate of Danish krone, expressed by nominal effective exchange rate index EER-42, USDDKK, EURDKK, JPYDKK. $Idiff_t$ variable denotes interest rate differential between domestic interest rate Cibor, and European 3 months interest rate Euribor, and interest rate differential between domestic interest rate Cibor and Libor (USD) rate, interest rate differential between domestic interest rate Cibor and Libor JPY. and. The other variables are Stock market index for Denmark ($OMXC20_t$), Chicago board options Exchange volatility index (VIX_t) and government response index (GRI_t). EER-42 is represented as level value, the other values are represented as first differences. The critical value for the ADF test is – 3.4327. The sample period is 01.01.2020-12.03.2021 and contains 288 daily observations.

Table 6 Exchange rate impact regression Danish krone

	EER-42	EURDKK	USDDKK	JPYDKK
α	0.0002	-0.00002	-0.0002	0.0003
	(0.0001)	(0.00001)	(0.0003)	(0.0003)
$I_{diff,t}$	0.0003***	0.00001	0.006	-0.004
	(0.0001)	(0.00001)	(0.007)	(0.005)
sm_t	-0.044***	-0.0004	0.018	-0.007
	(0.008)	(0.001)	(0.021)	(0.022)
vix_t	-0.001	-0.0001	-0.0003	-0.002
	(0.001)	(0.0001)	(0.003)	(0.003)
gri_t	-0.002	-0.0001	-0.004	0.003
	(0.002)	(0.0002)	(0.005)	(0.006)
Observations	288	288	288	288
R2	0.164	0.008	0.008	0.005
Adjusted R2	0.153	-0.006	-0.006	-0.009
Residual Std. Error (df = 283)	0.002	0.0002	0.005	0.005
F Statistic (df = 4; 283)	13.924***	0.588	0.542	0.388
Note:	*p<0.1;	**p<0.05;	***p<0.01	

Notes: The exchange rate regression table contains 288 daily observations for the period 01.01.2020-12.03.2021. $I_{diff,t}$ variable denotes interest rate differential between domestic interest rates Cibor, and European 3 months interest rate, and interest rate differential between domestic interest rate Cibor and Libor (USD) rate, interest rate differential between domestic interest rate Cibor and Libor JPY. The other variables are Stock market index (sm_t) for Denmark (OMXC20$_t$), Chicago board options Exchange volatility index (vix_t) and government response index (gri_t). The F-statistics refers to the joint null hypothesis.

The regression model with EER-42 index has the highest adjusted R2, suggesting that this model explains 15,3% of the variation in the Danish krone exchange rate. Bilateral models have negative adjusted R2, suggesting poor fit of the model. The interest rate differential between the domestic interbank interest rate Cibor and Euribor is a very significant variable at 1% level in EER-42 model. As the differential between the domestic and foreign interest rate increases by 1 %, Danish krone appreciates by 0,03%. This is an expected result as Denmark follows fixed exchange rate policy with regards to Euro (Danmarks Nationalbank, 2017). Stock market variable, proxied by OMXC20, is significant in EER-42 model at 1% level. The effect, however, is negative. This is consistent with portfolio rebalancing theory, suggesting negative correlation between currency exchange rate and equity market (Hau & Rey, 2005).

The way government responded to the spread of Covid-19 appears to be insignificant for Danish krone exchange rate.

4.3. Swedish krona

The analysis for Swedish krona is based on 277 observations. We use the same method as we did for the Norwegian and Danish Krone.

Table 7 Descriptive Statistics of price impact regression for Sweden

	Average	*SD*	*Kurt*	*Skew.*	*Count*	*ADF test t-statistics*
EER-42 $_{Sweden,t}$	94.3636	3.0525	-1.2992	-0.3220	277	-2.291
$Idiff_{euribor,t}$	-0.4930	0.4485	0.84434	-0.2473	277	-2.157
$SEKUSD_t$	-0.0003	0.0070	3.07028	0.6392	277	-1.634
$Idiff_{libor\ USD,t}$	-0.0059	0.0558	8.90672	-0.1841	277	-1.557
$SEKJPY_t$	0.0003	0.0077	3.28922	-0.2095	277	-1.229
$Idiff_{libor\ JPY,t}$	-0.0942	1.4319	230.968	-14.4887	277	-2.280
$EURSEK_t$	-0.0001	0.0047	5.22077	0.7359	277	-1.657
$OMXS30_t$	0.0008	0.0175	6.46121	-0.9962	277	-1.802
VIX_t	0.0044	0.1067	10.4313	2.4945	277	-2.569
GRI_t	0.0088	0.0686	100.9893	9.6885	277	-1.024

Notes: The table reports descriptive statistics for the exchange rate of Swedish krone, expressed by nominal effective exchange rate index EER-42, USDSEK, EURSEK, JPYSEK. $Idiff_t$ variable denotes interest rate differential between domestic interest rate Stibor, and European 3 months interest rate Euribor, and interest rate differential between domestic interest rate Stibor and Libor (USD) rate, interest rate differential between domestic interest rate Stibor and Libor JPY. and. The other variables are Stock market index for Sweden ($OMXS30_t$), Chicago board options Exchange volatility index (VIX_t) and government response index (GRI_t). EER-42 is represented as level value, the other values are represented as first differences. The critical value for the ADF test is – 3.4327. The sample period is 01.01.2020-12.03.2021 and contains 277 daily observations.

Table 8 Exchange rate price impact regression Swedish krona

	EER-42	USDSEK	JPYSEK	EURSEK
α	0.0003	-0.0004	0.001	-0.0001
	(0.0002)	(0.0004)	(0.0005)	(0.0003)
$I_{diff,t}$	0.004	0.009	-0.0001	0.026**
	(0.009)	(0.008)	(0.0003)	(0.012)
sm_t	0.022*	0.040	-0.032	0.018
	(0.013)	(0.026)	(0.028)	(0.017)
vix_t	-0.0004	-0.001	-0.0003	-0.002
	(0.002)	(0.004)	(0.004)	(0.003)
GRI_t	-0.006*	0.006	-0.009	-0.001
	(0.003)	(0.007)	(0.007)	(0.004)
Observations	277	277	277	277
R2	0.029	0.017	0.009	0.023
Adjusted R2	0.015	0.002	-0.006	0.008
Residual Std. Error (df = 272)	0.004	0.007	0.008	0.005
F Statistic (df = 4; 272)	2.035*	1.157	0.588	1.586

Notes: The exchange rate regression table contains 277 daily observations for the period 01.01.2020-12.03.2021. $I_{diff,t}$ variable denotes interest rate differential between the domestic interest rate Stibor, and European 3 months interest rate Euribor, and interest rate differential between domestic interest rate Stibor and Libor (USD) rate, interest rate differential between domestic interest rate Stibor r and Libor JPY, and Stock market index for Sweden (OMXS30). The other variables are Stock market index for Denmark ($OMXC20_t$), Chicago board options Exchange volatility index (vix_t) and government response index (gri_t). The F-statistics refers to the joint null hypothesis.

Table 8 shows the regression output Sweden. The EER-42 model has the highest adjusted R2 of 0.015 that is considerably lower than adjusted R2 for the other countries. It is followed by the EURSEK, USDSEK, JPYSEK, respectively. A higher value of EERS-42 index implies a stronger

SEK, while higher value of EURSEK, USDSEK, JPYSEK implies weaker Swedish krona. Stock market, represented by OMXS30, and Government response index are both significant at 10 percent level. The results show that increase in the stock market is associated with appreciation of Swedish krona. The GRI index has negative coefficient, which suggests that the increase in government response index by 1% will lead to depreciation by 0,6%. The effect is similar to the one we observed with NOK, but in Norwegian model we observed higher coefficient and stronger significance. This is a surprising effect as our dataset shows that Sweden has implemented more GRI associated measures than Norway, see Figure 5. Intuitively, we would expect higher coefficient in the country with higher GRI.

4.4. Comparative analysis Norway, Denmark, and Sweden

For all the three countries EER - 42 seems to be a better estimate as regressions with EER - 42 index have higher R2.

Table 9 Comparative analysis Norway, Sweden and Denmark

	$EER\text{-}42_{N,t}$	$EER\text{-}42_{D,t}$	$EER\text{-}42_{S,t}$
a	0.0001	0.0002	0.0003
	(0.0004)	(0.0001)	(0.0002)
$I_{diff,t}$	0.002	0.0003***	0.004
	(0.016)	(0.0001)	(0.009)
sm_t	0.207***	-0.044***	0.022*
	(0.031)	(0.008)	(0.013)
vix_t	-0.001	-0.001	-0.0004
	(0.004)	(0.001)	(0.002)
gri_t	-0.014**	-0.002	-0.006*
	(0.007)	(0.002)	(0.003)
oil_t	0.018		
	(0.013)		
Observations	287	288	277
R2	**0.249**	**0.164**	**0.029**
Adjusted R2	**0.236**	**0.153**	**0.015**
Residual Std. Error (df =281)	0.007	0.002	0.004
F Statistic (df = 5; 281)	18.677***	13.924***	2.035*
Note:	*p<0.1;	**p<0.05;	***p<0.01

Notes: The table contains 287 daily observations for Norway, 288 daily observations for Denmark and 277 observations for Sweden, for the period 01.01.2020-12.03.2021. Currency price is denoted by nominal effective exchange rate index $EER\text{-}42_{N,t}$ for Norway, $EER\text{-}42_{D,t}$ for Denmark, $EER\text{-}42_{S,t}$ for Sweden. $Idiff_t$ variable denotes interest rate differential between domestic interest rates Nibor, Stibor and Cibor, and European 3 months interest rate Euribor and interest rate differential between domestic currencies, Libor (USD) rate, interest rate differential between domestic interest rate and Libor (JPY), and Stock market index (sm_t) for Norway ($OSEBX_t$), Sweden ($OMXS20_t$) and Denmark ($OMXC30_t$). The other variables are (oil_t,) expressed by daily relative change in USD-denominated Brent oil Price, Chicago board options Exchange volatility index (vix_t) and government response index (gri_t). The F-statistics refers to the joint null hypothesis.

The results from the EER-42 regressions of Norway, Denmark, and Sweden show that Government response to the spread of Covid-19 is significant at 5% in Norway and 10% and Sweden, but not significant in Denmark. Government response to Covid-19 seems to have stronger negative correlation with exchange rate of Norwegian crone than with other Scandinavian currencies in scope of this master thesis. This is in spite the fact the Norwegian GRI is lower in comparison with other countries, see Figure 5 (GRI index divided in subindices).

Stock market is a significant variable for all 3 countries, for Norway and Denmark at 1% level, while for Sweden – at 10% level. The effect leads to appreciation of Norwegian krone and Swedish krona, but depreciation of Danish krone. This is consistent with theoretical approach, suggesting the correlation between stock market returns and exchange rate. Both appreciation and depreciation effects are consistent with portfolio rebalancing theory in the short run (Hau & Rey, 2005) and global capital flows (Yang & Doong, 2004).

The regression model appears to be a better fit for Norway, than for Denmark and Sweden. Denmark`s fixed monetary policy with respect to Euro might explain the significance of interest rate differential in the model.

4.5. Other Covid -19 indexes effect on exchange rates

GRI is the index that involves all the categories and biggest number of indicators. In the previous analysis we have seen that the actions taken by the governments as a response to Covid-19 affected Norway, Denmark, and Sweden. Looking at the other indexes, (with fewer number of indicators) that define specific measures, may explain if some actions taken by the governments affected exchange rates more than the others. We are going to use EER-42 as exchange rate estimator because it has shown higher explanatory power in comparison with other currencies in the previous analysis.

4.5.1. SI (Stringency index)

Table 10 Exchange rate price impact regression Stringency index

	$EERS\text{-}42_{S,t}$	$EER\text{-}42_{D,t}$	$EER\text{-}42_{N,t}$
α	0.0003	0.0002*	0.0001
	(0.0002)	(0.0001)	(0.0005)
$I_{diff,t}$	0.01	0.0002***	0.001
	(0.009)	(0.0001)	(0.017)
sm_t	0.018	-0.043***	0.208***
	(0.013)	(0.007)	(0.032)
vix_t	-0.001	-0.001	-0.001
	(0.002)	(0.001)	(0.005)
si_t	-0.008***	-0.003*	-0.012**
	(0.002)	(0.001)	(0.006)
oil_t			0.017
			(0.014)
Observations	288	287	277
R2	0.174	0.248	0.052
Adjusted R2	0.162	0.236	0.038
Res Std. Er	0.002 (df = 283)	0.007 (df = 281)	0.004 (df = 272)
F Statistic	13.226*** (df = 4; 283)	17.278*** (df = 5; 281)	3.710*** (df = 4; 272)

Note: *p<0.1; **p<0.05; ***p<0.01

Notes: The table contains 287 daily observations for Norway, 288 daily observations for Denmark and 277 observations for Sweden, for the period 01.01.2020-12.03.2021. Currency price is denoted by nominal effective exchange rate index $EER\text{-}42_{N,t}$ for Norway, $EER\text{-}42_{D,t}$ for Denmark, $EER\text{-}42_{S,t}$ for Sweden. $I_{diff,t}$ variable denotes interest rate differential between domestic interest rates Nibor, Stibor and Cibor, and European 3 months interest rate Euribor and interest rate differential between domestic currencies, Libor (USD) rate, interest rate differential between domestic interest rate and Libor (JPY), and Stock market index (sm_t) for Norway ($OSEBX_t$), Sweden ($OMXS20_t$) and Denmark ($OMXC30_t$). The other variables are (oil_t), expressed by daily relative change in USD-denominated Brent oil Price, Chicago board options Exchange volatility index (vix_t) and stringency index (si_t). The F-statistics refers to the joint null hypothesis.

Stringency index affected exchange rates in all three countries. SI only includes measures restricting social contact between people, including travel restrictions, restrictions on public gatherings and closing of public institutions. The index is significant in Denmark at 10% level, 5% level in Norway and 1% level in Sweden. The coefficient is negative in all three countries. The effect is strongest in Norway, suggesting that 1 percent increase in stringency index would lead to 1,2 % depreciation of Norwegian Krone. The index involves such actions as school closing, workplace closing, cancelling of public events and restrictions on gathering size. The negative significant effect may seem surprising for Sweden, as the country was not under lock down during any time of our analysis. This may be explained by the fact that Sweden had strict policy on public gatherings and international travels and maintained the policy during the whole period while Norway decreased the number of restrictive measures during the summer period.

4.5.2. CHI (Containment Health index)

Table 11 Exchange rate price impact regression Containment Health Index

	$EERS\text{-}42_{S,t}$	$EER\text{-}42_{D,t}$	$EER\text{-}42_{N,t}$
α	0.0003	0.0002*	0.0001
	(0.0002)	(0.0001)	(0.0004)
$I_{diff,t}$	0.007	0.0002***	0.002
	(0.010)	(0.0001)	(0.016)
sm_t	0.025*	-0.043***	0.208***
	(0.013)	(0.007)	(0.031)
vix_t	-0.001	-0.001	-0.001
	(0.002)	(0.001)	(0.004)
chi_t	-0.005	-0.004**	-0.013**
	(0.003)	(0.002)	(0.007)
oil_t			0.017
			(0.013)
Observations	278	288	287
R2	0.026	0.176	0.249
Adjusted R2	0.012	0.165	0.236
Res Std. Er	0.004 (df = 273)	0.002 (df = 283)	0.007 (df = 281)
F Statistic	1.815 (df = 4; 273)	15.128*** (df = 4; 283)	18.635*** (df = 5; 281)

Note: *p<0.1; **p<0.05; ***p<0.01

Notes: The table contains 287 daily observations for Norway, 288 daily observations for Denmark and 277 observations for Sweden, for the period 01.01.2020-12.03.2021. Currency price is denoted by nominal effective exchange rate index $EER\text{-}42_{N,t}$ for Norway, $EER\text{-}42_{D,t}$ for Denmark, $EER\text{-}42_{S,t}$ for Sweden. $I_{diff,t}$ variable denotes interest rate differential between domestic interest rates Nibor, Stibor and Cibor, and European 3 months interest rate Euribor and interest rate differential between domestic currencies, Libor (USD) rate, interest rate differential between domestic interest rate and Libor (JPY), and Stock market index (sm_t) for Norway ($OSEBX_t$), Sweden ($OMXS20_t$) and Denmark ($OMXC30_t$). The other variables are (oil_t), expressed by daily relative change in USD-denominated Brent *oil Price, Chicago board options Exchange volatility index (vix_t) and containment and health index (chi_t). The F-statistics refers to the joint null hypothesis.*

The containment health index describes measures implemented to limit both the social interaction between people, and spread of the Covid-19 virus, through facial coverings, protection of elderly, vaccination policy and information campaigns. The effect of CHI on the exchange rate is significant at 5 percent level in Denmark and Norway but is not significant in Sweden. The effect is estimated to be stronger in Norway, implying that 1% increase in CHI will lead to 1,3% decrease in NOK. The coefficient of SI and CHI are almost the same for Norway, implying that these governmental actions have almost had the same effect.

4.5.3. ESI (Economic support index)

Table 12 Exchange rate price impact regression Economic support index

	$EERS\text{-}42_{S,t}$	$EER\text{-}42_{D,t}$	$EER\text{-}42_{N,t}$
α	0.0002	0.0002	-0.0001
	(0.0002)	(0.0001)	(0.0004)
$i_{diff,t}$	0.003	0.0003***	0.007
	(0.009)	(0.0001)	(0.016)
sm_t	0.029**	-0.044***	0.229***
	(0.013)	(0.008)	(0.029)
vix_t	-0.001	-0.001	-0.001
	(0.002)	(0.001)	(0.004)
esi_t	0.004	0.0004	-0.002
	(0.005)	(0.001)	(0.017)
oil_t			0.014
			(0.013)
Observations	278	288	287
R2	0.021	0.163	0.238
Adjusted R2	0.007	0.151	0.224
Res. Std. Er	0.004 (df = 273)	0.002 (df = 283)	0.007 (df = 281)
F Statistic	1.489 (df = 4; 273)	13.759*** (df = 4; 283)	17.535*** (df = 5; 281)

Note: *p<0.1; **p<0.05; ***p<0.01

Notes: The table contains 287 daily observations for Norway, 288 daily observations for Denmark and 277 observations for Sweden, for the period 01.01.2020-12.03.2021. Currency price is denoted by nominal effective exchange rate index $EER\text{-}42_{N,t}$ for Norway, $EER\text{-}42_{D,t}$ for Denmark, $EER\text{-}42_{S,t}$ for Sweden. $I_{diff,t}$ variable denotes interest rate differential between domestic interest rates Nibor, Stibor and Cibor, and European 3 months interest rate Euribor and interest rate differential between domestic currencies, Libor (USD) rate, interest rate differential between domestic interest rate and Libor (JPY), and Stock market index (sm_t) for Norway ($OSEBX_t$), Sweden ($OMXS20_t$) and Denmark ($OMXC30_t$). The other variables are (oil_t), expressed by daily relative change in USD-denominated Brent *oil Price, Chicago board options Exchange volatility index (vix_t) and economic support index (esi_t). The F-statistics refers to the joint null hypothesis.*

Economic support index does not seem to have any significant effect on currency exchange rate in any of three countries we observe. Under the pandemic, the governments implemented several actions to help business units: loans with state guarantee, compensation for fixed expenses for businesses with considerable decrease in turnover, postponed payments and deadlines of taxes, negative interest rates etc. These actions do not seem to have statistically significant effect on exchange rates in any country.

Table 13 Index impact on currency in Sweden, Denmark, and Norway

	$EER\text{-}42_{S,t}$	$EER\text{-}42_{D,t}$	$EER\text{-}42_{N,t}$
gri_t	-0.006*	-0.002	-0.014***
	(0.003)	(0.002)	(0.007)
si_t	-0.008***	-0.003*	-0.012**
	(0.002)	(0.001)	(0.006)
chi_t	-0.005	-0.004**	-0.013**
	(0.003)	(0.002)	(0.007)
esi_t	0.004	0.004	-0.002
	(0.005)	(0.001)	(0.017)

Note: *p<0.1; **p<0.05; ***p<0.01

Notes: The table summarizes the effect of government response index (gri_t), stringency index (si_t), containment and health index (chi_t), and economic support index (esi_t) on the currency exchange rate measured by EER-42, nominal effective exchange rate index. The sample period is 01.01.2020-12.03.2021 and contains 287, 288 and 287 observations, respectively.

Impact of governmental restrictions has negative effect on exchange rate in all three countries, with the strongest effect in Norway. The stringency index coefficient is strongest in Norway, followed by Sweden and Denmark. Containment and Health index, that includes the same measures as GRI, except economic support, is significant at 5% level in Norway and Denmark, but not Sweden.

4.6. Comparative analysis in the long run

For the comparative analysis in the long-run we have chosen EER-42, as it has higher explanatory power in our short- run analysis.

Table 14 Exchange rate impact regression long run

	$EER\text{-}42_{N,t}$	$EER\text{-}42_{D,t}$	$EER\text{-}42_{S,t}$
α	-0.0004	-0.0001	0.0002
	(0.0004)	(0.001)	(0.0003)
$i_{diff,t}$	0.034***	0.00005	-0.001
	(-0.01)	(-0.001)	(0.001)
sm_t	0.091***	0.014	0.030*
	(-0.022)	(-0.033)	(0.018)
vix_t	-0.010***	0.004	-0.009***
	(0.003)	(0.005)	(0.002)
oil_t	0.055***		
	(-0.011)		
Observations	583	581	583
R2	0.232	0,002	0.066
Adjusted R2	0.227	-0.004	0.061
Residual Std. Error	0.009 (df = 578)	0.016 (df = 577)	0.008 (df = 579)
F-Statistic	43.767*** (df = 4; 578)	0.299 (df = 3; 577)	13.707*** (df = 3; 579)

Note: *p<0.1; **p<0.05; ***p<0.01

Notes: The table contains 582, 580, 582 end-of-week observations for Norway, Denmark, and Sweden, respectively for the period 01.01.2010-12.03.2021. Exchange rate is represented by nominal effective exchange rate index, $EER\text{-}42_{N,t}$ for Norway, $EER\text{-}42_{D,t}$ for Denmark, $EER\text{-}42_{S,t}$ for Sweden. $I_{diff,t}$ variable denotes interest rate differential between domestic interest rates Nibor, Stibor and Cibor, and European 3 months interest rate Euribor and interest rate differential between domestic currencies, Libor (USD) rate, interest rate differential between domestic interest rate and Libor (JPY). The other variables are Stock market index (sm_t) for Norway ($OSEBX_t$), Sweden ($OMXS20_t$) and Denmark ($OMXC30_t$). CBOE`s volatility index, vix_t, USD-denominated Brent oil Price (oil_t). The F-statistics refers to the joint null hypothesis.

Model for Norway shows that interest rate differential, stock market, oil price and global volatility are very significant at 1% level. Index exchange rate movements follow the currency, meaning that the index goes up when currency appreciates. As stock market index, oil price and interest rate differential increase, Norwegian krone appreciates. Moreover, stock market coefficient is rather big, suggesting that 1 % increase in stock market price will lead to currency appreciation by 9,2%. The results support UIP theory and earlier empirical findings about oil price significance for Norwegian currency as well as Hau`s and Rey`s (2004) findings about the codependence of stock market and exchange rates. Global volatility negatively affects the currency price, implying that as the variables go up by 1%, Norwegian krone depreciates by 1%. In Swedish model global volatility and stock market appear to be significant at 1% and 10% level, respectively. These results support empirical studies described in chapter 2. Our model seems to be a better fit for Norway with adjusted R2 of 25,2%. No variables are significant in the Danish model. Possible explanation could be that EER-42 is not a good measure for Danish krone in the long run. The results can also be explained by Denmark`s fixed rate policy.

As our model seems to be a better fit for Norway in the long run, supporting empirical studies, we are going to perform a long run regression with currency pairs for Norway.

Table 15 Price impact regression bilateral exchange rates long run

	$EURNOK_t$	$USDNOK_t$	$JPYNOK_t$
α_t	0.0005	0.001	-0.0002
	(0.001)	(0.001)	(0.001)
$I_{diff,t}$	-0.012	0.001*	0.012
	(0.014)	(0.001)	(0.018)
sm_t	-0.025	-0.026	-0.024
	(0.031)	(0.043)	(0.047)
vix_t	-0.006	-0.010*	0.004
	(0.004)	(0.005)	(0.006)
oil_t	-0.039**	-0.065***	0.017
	(0.015)	(0.021)	(0.023)
Observations	583	583	583
R2	0.021	0.030	0.005
Adjusted R2	0.014	0.023	-0.002
Residual Std. Error (df = 577)	0.013	0.018	0.020
F Statistic (df = 5; 577)	3.077**	4.499***	0.674
Note:	*p<0.1; **p<0.05; ***p<0.01		

Notes: The table contains 583 end-of-week observations for Norway, for the period 01.01.2010-12.03.2021. Exchange rate is represented by bilateral exchange rates $EURNOK_t$, $USDNOK_t$ and $JPYNOK_t$. $I_{diff,t}$ variable denotes interest rate differential between domestic interest rates Nibor, and European 3 months interest rate Euribor, Libor (USD) rate for USDNOK regression, Libor (JPY) for JPYNOK regression. The other variables are Stock market index (sm_t) for Norway (OSEBX), CBOE`s volatility index, (vix_t), USD-denominated Brent oil Price (oil_t). The F-statistics refers to the joint null hypothesis.

Unlike in index exchange rate models, increase in exchange rate in bilateral models implies currency depreciation. Long run regression with currency pairs shows that oil price is an important factor in explaining the variation in exchange rate for Norwegian krone. The variable is significant at 5 percent level in ERUNOK model and at 1% level in USDNOK model. The coefficients are also high and negative, suggesting that increase in oil price leads to currency appreciation. This is an expected result that supports earlier empirical studies and our previous results. In USD model both interest rate differential and global volatility are significant at 10% level. This is most probably connected to the oil as major export for Norway which is traded in USD. No variables are significant for JPY model. This is consistent with the fact that only 2,06% of total trade is associated with JPY, see Appendix B.

5. Conclusion

The rapid spread of Covid-19 made governments around the globe to react in a way that limited people`s social and economic activity. As Norwegian prime minister said at the press conference on the 12th of March 2020, “Nå kommer de mest inngripende tiltak vi har hatt i Norge i fredstid», meaning that the measures the governments are going to impose on country`s citizens are the most restrictive after the war time.

In this master thesis we have examined the effect of the government response to the Covid-19 virus on exchange rate in Norway, Sweden, and Denmark. The index model with 42 international trading partners appeared to be a better estimate for the currency exchange rate than the bilateral models.

Our research shows that measures the governments implemented in Norway, Sweden and Denmark had a significant effect on currency depreciation. The effect seems to be stronger in Norway, although, according to GRI, SI, CHI and ESI indexes, the amount of implemented measures was lower in Norway, than in Denmark or Sweden. The weakest effect is observed in Sweden. School closure, work closure, restrictions on public gatherings, public campaign seem to have substantial effect on currency movements. While economic support alone given to the businesses and individuals due to pandemic seem to have no significant effect on the exchange rate.

Bibliography

Ajayi, R., & Mougoue, M. (1996, summer). On the dynamic relation between stock prices and exhcange rates. *The journal of financial researh*, pp. 193-207. doi:doi:10.1111/j.1475-6803.1996.tb00593

Akram, F. Q. (2019). Oil Price drivers, geopolitical uncertainty and oil exporters currencies. Norges Bank. Retrieved from Norges-bank.no: https://www.norges-bank.no/contentassets/bc4bfc49fbe24cb195a0952e80d32bec/wp_15_2019.pdf?v=09/18/2019134011&ft=.pdf&v=09/18/2019134011&ft=.pdf

Akram, F. Q., & Haroon, M. (2016). *The role of oil prices and monetary policy in the Norwegian economy since the 1980s.* Retrieved from Norges-bank.no: https://www.norges-bank.no/contentassets/cc93582b6676481da48c27edd8fe7287/working_paper_01_16.pdf?v=03/09/2017123300&ft=.pdf

Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., . . . Thwaites, G. (2020, November 1). Economic uncertainty before and during COVID-19 pandemic. *Journal of Public Economics, volume 191*, pp. 2-8. doi:https://doi.org/10.1016/j.jpubeco.2020.104274

Baker, S. R., Bloom , N., Davis, S. J., Kost, K. J., Sammon, M. C., & Viratyosin, T. (2020, April). The Unprecedented Stock Market Impact of COVID-19. *National Bureau of Economic Research, working paper 26945*, pp. 1-3. doi:DOI 10.3386/w26945

Bansal, R., & Dahlquist, M. (2000, June 1). The forward premium puzzle:different tales from developed and emerging economies. *Journal of international Economics, Volume 51, issue 1*, pp. 115-144. doi:https://doi.org/10.1016/S0022-1996(99)00039-2

Barro , R. J., Ursua, J. F., & Weng, J. (2020, April). the coronavirus and the great influenza pandemic: lessons from the “spanish flu” for the coronavirus’s potential effects on mortality and economic activity. *NBER working paper series, working paper 26866*, pp. 1-27. Retrieved from https://www.nber.org/papers/w26866

Berg , C., & Grøttheim, R. (2017, January 5). *Monetary Policy in Sweden since 1992.* Retrieved from Bis: https://www.bis.org/publ/plcy02i.pdf

Bergvall, A. (2005). Exchange Rate Regimes and Macroeconomic Stability: The Case of Sweden. *Oxford Economic paper 57*, pp. 422-446. doi:10.1093/oep7gpi016

Blasques, F. F., Gorgi, P., & Koopman, S. S. (2021). Missing observations in Observation-Driven Time SEries Models. *Journal of Econometrics, 221,2*, pp. 542-568. doi:https://doi.org/10.1016/j.jeconom.2020.07.043

Blavatnik School of Government, University of Oxford, Radcliffe Observatory Quarte. (2021, april 1). *Covid-19 government responce tracker*. Retrieved from Research projects: https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker

Blavatnik School of Government, University of Oxford, Radcliffe Observatory Quarter. (2021, april 1). *Covid-19 government responce tracker*. Retrieved from Research projects: https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker

Bussiere, M., Menzie, C. D., Ferrara, L., & Heipepertz, J. (2018, February 10). The new Fama puzzle. *National Bureau of economic research, working paper 24342*, pp. 9-11. doi:10.3386/w24342

Chen, Y.-C., & Rogoff, K. (2003). Commodity Currencies. *Journal of International Economics, vol. 60, no. 1,*, pp. 133-160.

Cheung, Y.-W., Chinn, M. D., Pascual, A. G., & Zhang, Y. (2019, July). Exchange rate prediction redux: New models, new data, new currencies. *Journal of International Money and Finance, volume 95*, pp. 332-362. doi:https://doi.org/10.1016/j.jimonfin.2018.03.010

Cruz, I. (2020, February 23). *Economics*. Retrieved from worldatlas.com: https://www.worldatlas.com/articles/the-world-s-ten-most-traded-currencies.html

Danmarks Nationalbank. (2017, February 1). *Monetary and Exchange-rate policy.* Retrieved from Nationalbanken : www.nationalbanken.dk

Dengjun, Z. (2015). Interdependence between Nordic Stock markets and financial cooperation. *Review of accounting and Finance, vol. 14, no. 2*, pp. 172-188. Retrieved from Review of accounting and Finance.

ECB Statistics bulletin. (2020). *Statistical Data Warehouse, ECB, notes to exchange rates.* Retrieved from European central bank: https://sdw.ecb.europa.eu/reports.do?node=100000232

Eikon. (2021, april 1). *Refinitiv*. Retrieved from Eikon Thomsonreuters: http://eikon.thomsonreuters.com/index.html

Engel, C., West, K. D., & Mark, N. C. (2007, August). Exchange Rate Models Are Not as Bad as You Think. *National Bureau of Economic Research, working paper 13318*, pp. 381-383. doi:DOI 10.3386/w13318

European Central Bank. (2021, May 08). *Daily nominal effective exhcange rate*. Retrieved from www.ecb.europa.eu: https://www.ecb.europa.eu/stats/balance_of_payments_and_external/eer/html/index.en.html

Fama, E. F. (1984). Forward and Spot interest rates. *Journal of Monetary Economics, 14*, pp. 319-338. doi:https://doi.org/10.1016/0304-3932(84)90046-1

Farhi, E., & Gabaix, X. (2016, February 1). Rare disasters and Exchange rates. *The Quarterly Journal of Economics, Volume 131,* , pp. 1-52. doi:https://doi.org/10.1093/qje/qjv040

Ferraro, D., Rogoff, K., & Rossi, B. (2015). Can oil prices forecast exchange rate? *ournal of international money and finance, vol. 54,*, pp. 116-141.

Fred Economic Data. (2021). *3-Month London Interbank Offered Rate (LIBOR), based on Japanese Yen*. Retrieved from https://fred.stlouisfed.org/series/

Gabaix, X., & Maggiori, M. (2015, July). International liquidity and exchange rate dynamics. *The Quarterly Journal of Economics, 130(3)*, pp. 1369-1420. doi:10.3386/w19854

Hale, T., Anania, J., Angrist, N., Boby, T., Cameron-Blake, E., Ellen, L., . . . Zhang, Y. (2021, March). *Variation in government responses to COVID-19.* Retrieved from BSG-WP-2020/032: https://www.bsg.ox.ac.uk/sites/default/files/2021-03/BSG-WP-2020-032-v11.pdf

Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., . . . Tatlow, H. (2021, March 8). *Nature of Human behaviour.* Retrieved from Nature.com: https://www.nature.com/articles/s41562-021-01079-8

Hassan, S. M., & Riveros Gavilanes , J. M. (2021, January 6). First to React Is the Last to Forgive: Evidence from the Stock Market Impact of COVID 19. *Journal of Risk and Financial Management, 2021, Vol. 14,26*, pp. 4-6. Retrieved from Journal of Risk and Financial management, 14 (1): https://doi.org/10.3390/jrfm14010026

Hau, H., & Rey, H. (2004, May). Can portfoilo rebalancing explain the dynamics of equity returns, equity flows and exchange rates? *American Economic Review, volume 94, nr 2*, pp. 126-133. doi:doi: 10.1257/0002828041302389

Hau, H., & Rey, H. (2005, October 28). Exchange Rates, Equity Prices, and Capital Flows. *Review of Financial Studies. 19.*, pp. 273-317. doi:https://doi.org/10.1093/rfs/hhj008

Janus, J. (2021, February 15). The covid-19 shock and long term interest ratesin emerging market economies. *Finance research letters*, pp. 2-6. doi:https://doi.org/10.1016/j.frl.2021.101976

Klein, M. W., Shambaugh, J. C., & Klein, M. (2009, February). *Exchange Rate Regimes in the Modern Era.* Cambridge: Cambridge MIT press. Retrieved from ISBN: 9780262013659

Kloster , A., & Syrstad, O. (2019). *Nibor, Libor and Euribor -all IBORs, but different.* Retrieved from Norges-bank.no: https://www.norges-bank.no/contentassets/607da26db8df45a7983e135b73fa724e/staff_memo_2_2019_eng.pdf?v=03/01/2019101404&ft=.pdf

Kohlscheen, E., Avalos, F. H., & Schrimpf, A. (2016, April 8). When the walk is not random:commocdity prices and exchange rates. *BIS working papers, nr 551*, pp. 122-138. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2752433

Lee, Lee, & Wu. (2021). The impact of Covid -19 on hospitality stock returns in China. 2-4.

Liang , Y. (2012). Global imbalances and financial crisis: Financial globalization as a common cause. *Journal of Economic Issues, 46(2),*, pp. 353-362. doi:https://doi.org/10.2753/JEI0021-3624460210

Lugaro, C. (2018). *global, innovative and disruptive:Why Nordic companies are punching above their weight (White Paper).* Alfred Berg.

Lustig, H., Roussanov, N., & Verdelhan, A. (2008, June). Common Risk Factors in Currency Markets. *National Bureau of Economic Research, working paper nr 14082*, pp. 3731-3734. Retrieved from https://www.nber.org/system/files/working_papers/w14082/w14082.pdf

Nilsen, A. A. (2020, February 29). *Viruset gir dobbel-sjokk i økonomien: Derfor stuper børsene.* Retrieved from e24.no: https://e24.no/boers-og-finans/i/mRwb0p/viruset-gir-dobbel-sjokk-i-oekonomien-derfor-stuper-boersene

Norsk Petroleum. (2020). *Eksportverdier og volumer av norsk olje og gass.* Retrieved from Norsk petroleum, økonomi, Norsk Petroleum,: https://www.norskpetroleum.no/sok?s=2019

Nyhagen, K. (2019). *Brage .* Retrieved from University in Stavanger: https://uis.brage.unit.no/uis-xmlui/handle/11250/2618893?locale-attribute=en

OECD Publishing. (2020). How is life? measuring Well-being. Paris, France. doi:https://doi.org/10.1787/23089679

Oxford University. (2021, April 2). *Github*. Retrieved from covid policy tracker, documentation, interpretation guide: https://github.com/OxCGRT/covid-policy-tracker/blob/master/documentation/interpretation_guide.md

Palachy, S. (2019, July 21). *Detecting stationarity in time series data.* Retrieved from Towardsscience.com: https://towardsdatascience.com/detecting-stationarity-in-time-series-data-d29e0a21e638

Quiz, I. (2020, Ferburary 23). *World`s 10 most traded currencies.* Retrieved from Woldatlas: https://www.worldatlas.com/articles/the-world-s-ten-most-traded-currencies.html

The observatory of Economic Complexity (OEC). (2021). *OEC, nordic countries, Norway, Sweden, Danmark*. Retrieved from OEC: https://oec.world/en/profile/country/nor, https://oec.world/en/profile/country

The World Bank Group. (2021). *Popular indicators*. Retrieved from Databank World Bank Group: https://databank.worldbank.org/indicator/NY.GDP.PCAP.CD/1ff4a498/Popular-Indicators

Wen, Y. (2020, April 13). *Coronavirus effects on exchange rates*. Retrieved from https://fredblog.stlouisfed.org: https://fredblog.stlouisfed.org/2020/04/coronavirus-effects-on-exchange-rates/

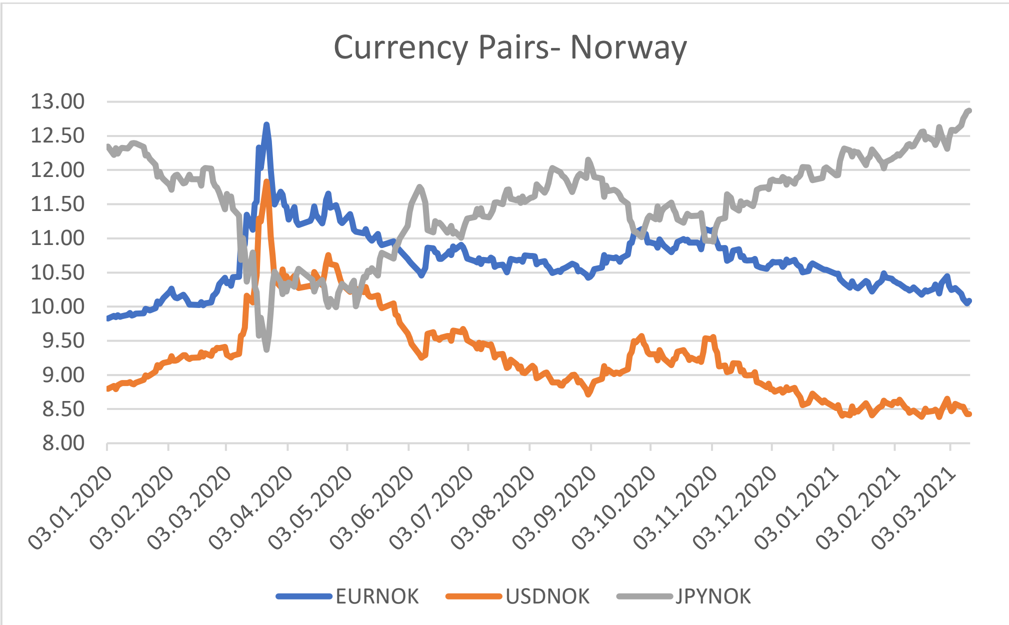
Wooldridge, J. M. (2015). *Introductory Econometrics, A modern approach.* South Western: Cengage Learning.

Yang, S.-Y., & Doong, S.-C. (2004). Price and volatility Spillovers between Stock prices and Exchange RAtes: Evidence from the G-7 countries. *International journal of Business and Economics, vol. 2, no. 24*, pp. 140-145.

Zaiontz, C. (2018). *Augmented Dickey-Fuller Test.* Retrieved from real-statistics.com: https://www.real-statistics.com/time-series-analysis/autoregressive-processes/augmented-dickey-fuller-test/

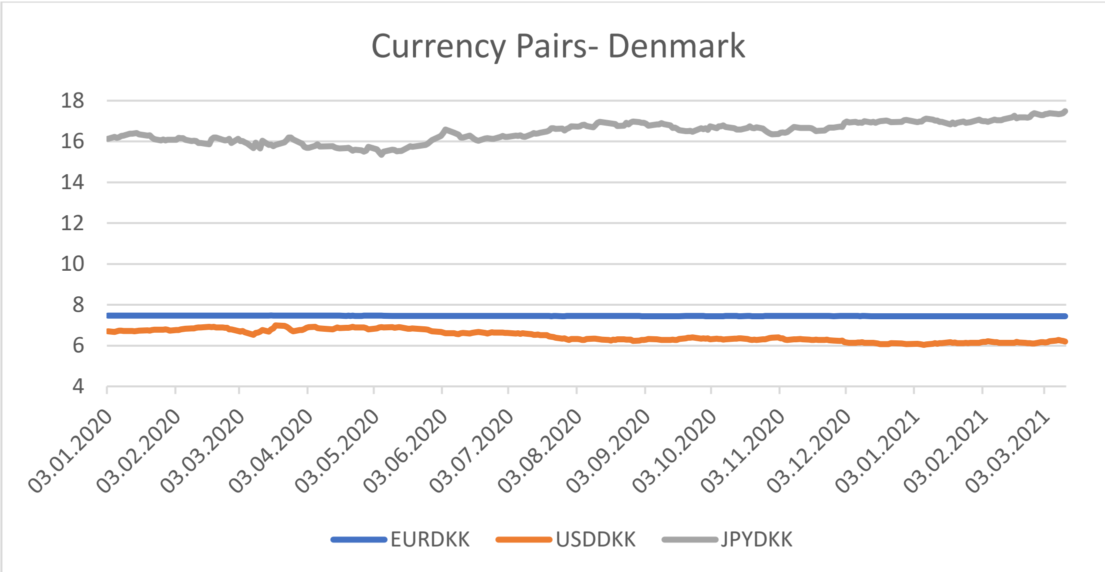
Appendix: A- Figures

Figure 6: Currency Pairs (2020-2021)



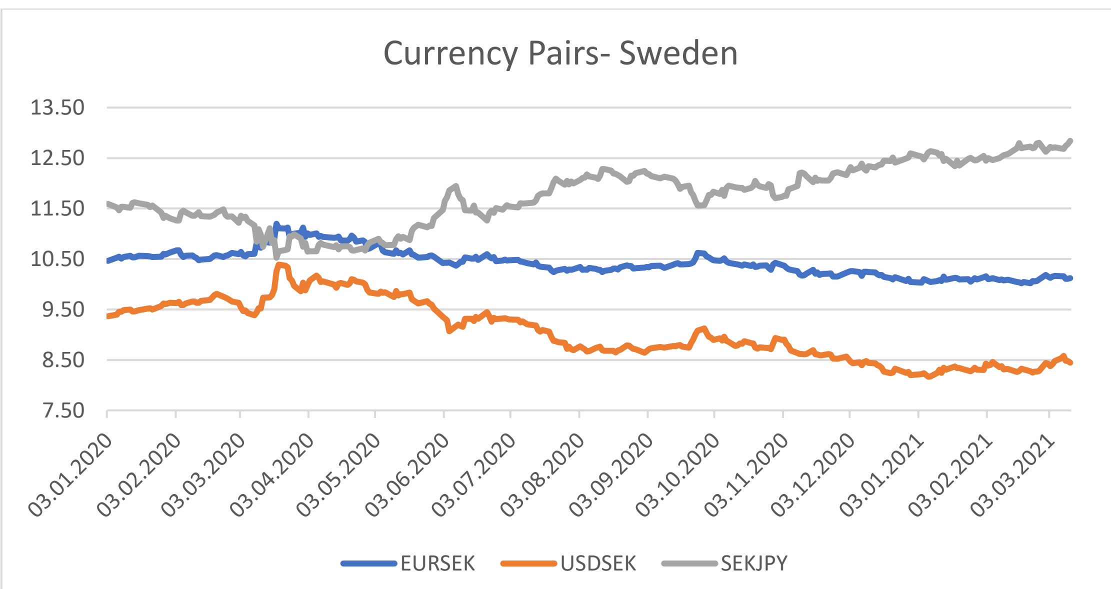
Notes: The figure above presents the movements of the three currency pairs for Norway during the period 01.01.2020-12.03.2021. EURNOK (1:1), USDNOK (1:1); JPYNOK (100:1)

Figure 7 Currency Pairs (2020-2021)



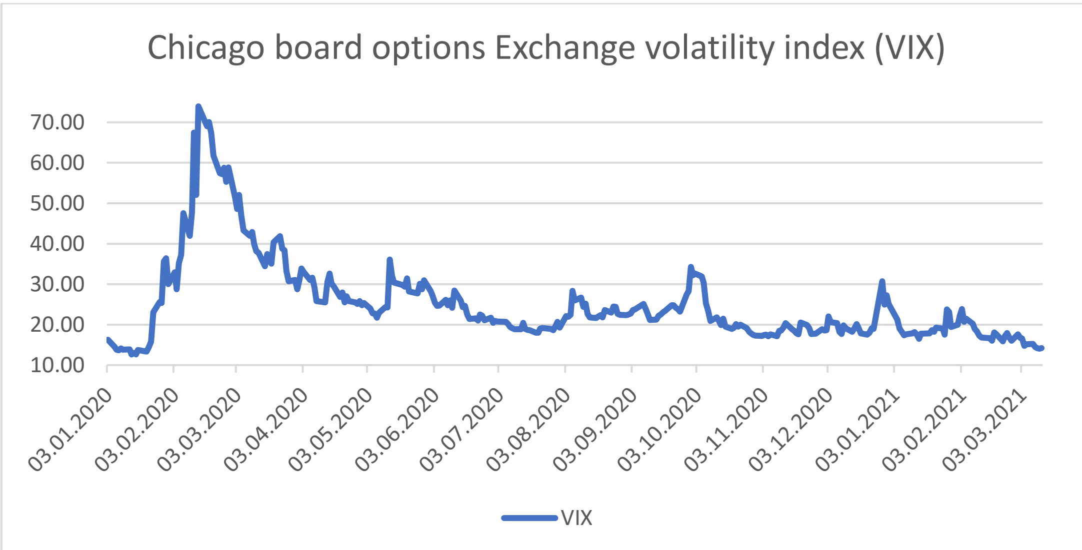
Notes: The figure above presents the movements of the three currency pairs for Denmark during the period 01.01.2020-12.03.2021. EURDKK (1:1), USDDKK (1:1); JPYDKK (100:1)

Figure 8 Currency Pairs (2020-2021)



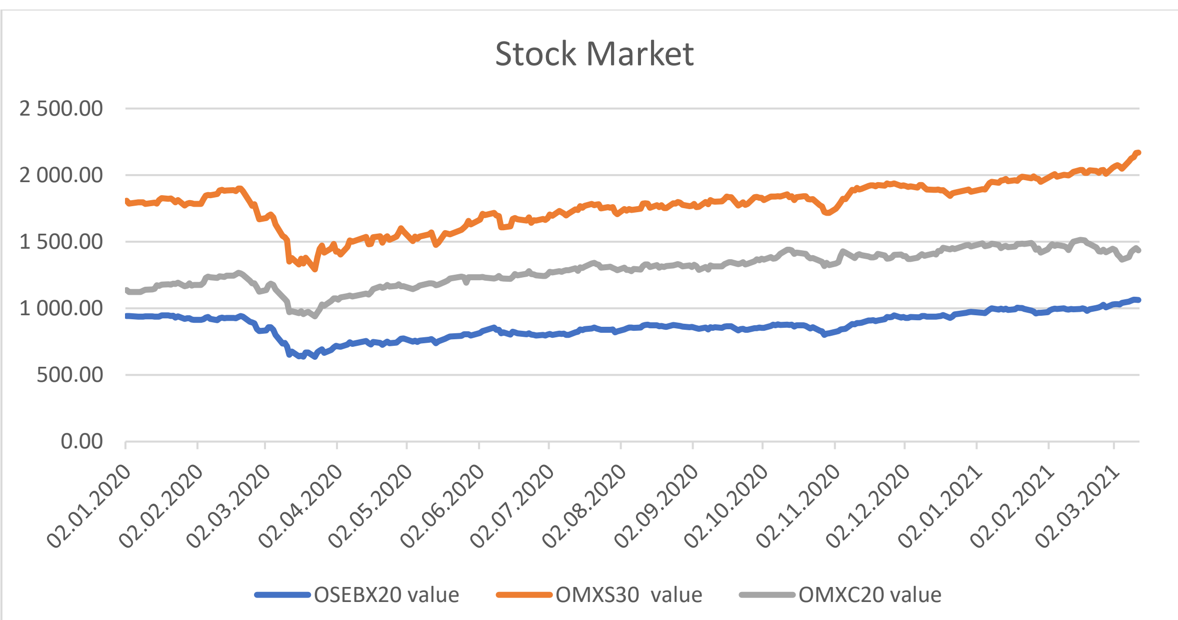
Notes: The figure above presents the movements of the three currency pairs for Sweden during the period 01.01.2020-12.03.2021. EURSEK (1:1), USDSEK (1:1); JPYSEK (100:1)

Figure 9 VIX value period 2020-2021



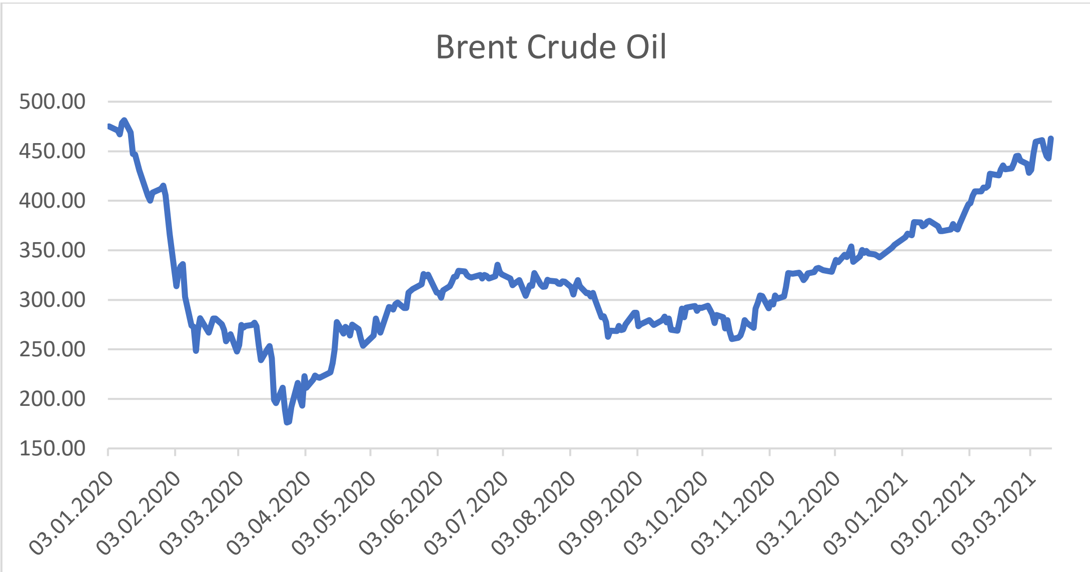
Notes: The figure above presents the movements of VIX, CBOE global volatility index, in the period 01.01.2020-12.03.2021.

Figure 10 Stock Market 2020-2021



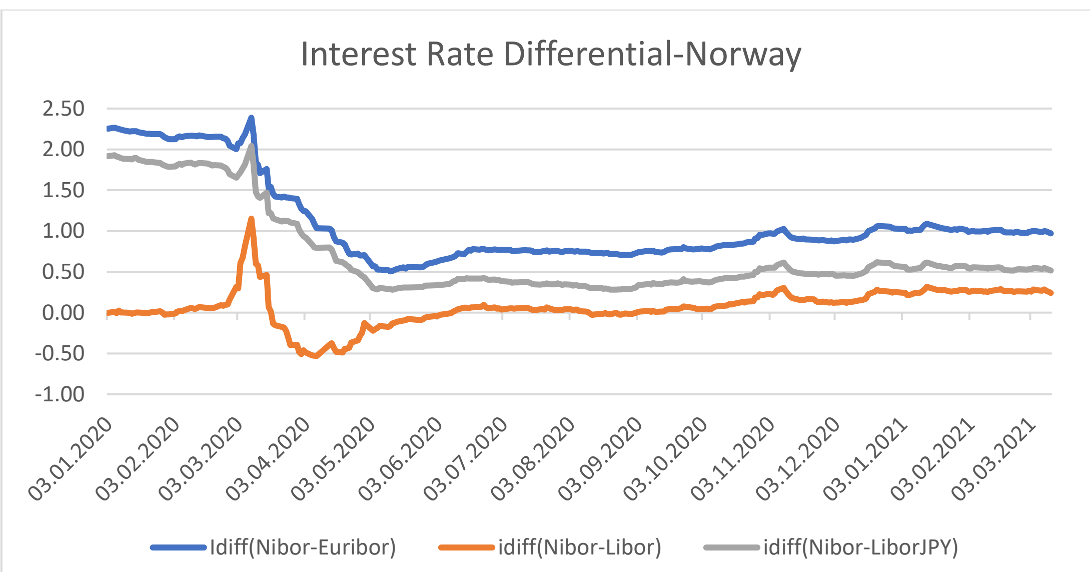
Notes: The figure above presents the movements of the three stock markets indexes OMXS30, OSEBX, OMXC20 during the period 01.01.2020-12.03.2021.

Figure 11 Brent Crude Oil Norway



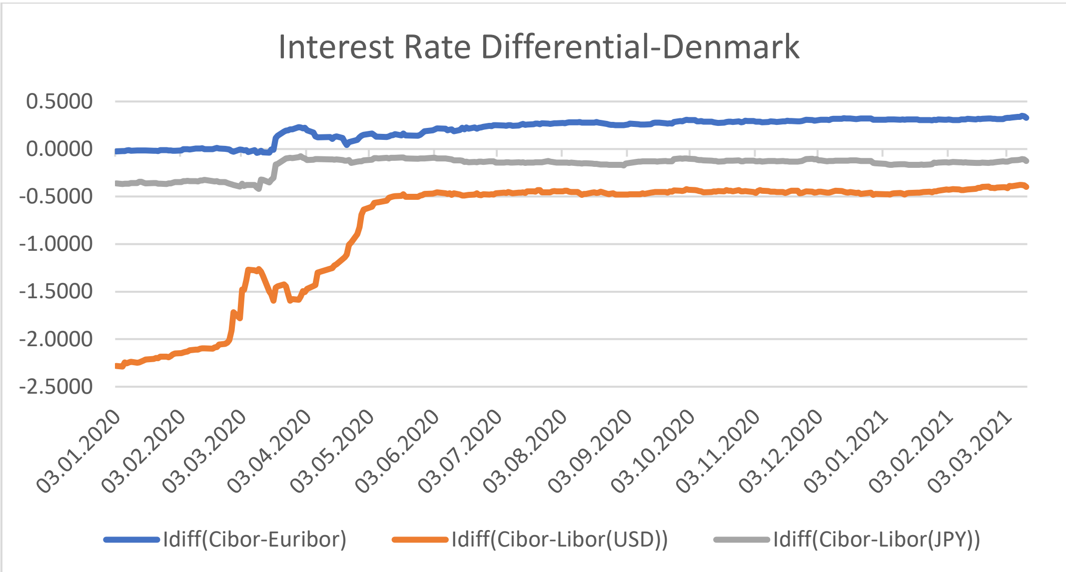
Notes: The figure above presents the movements of the Oil commodity in Norway during the period 01.01.2020-12.03.2021.

Figure 12 Interest Rate Differential Norway



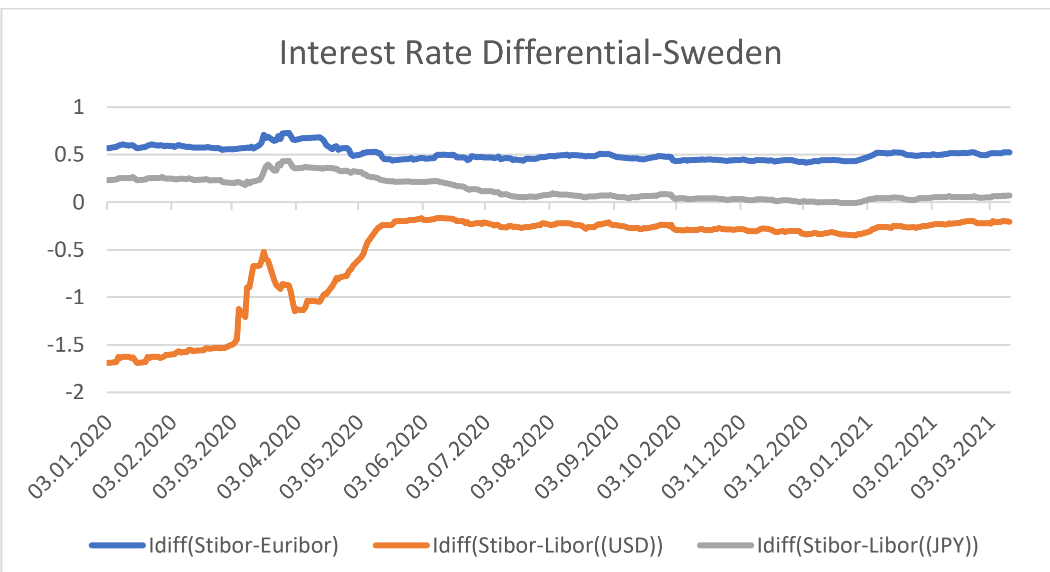
Notes: The figure above presents the movements of the three interest rate differentials for Norway during the period 01.01.2020-12.03.2021.

Figure 13 Interest Rate Differential Denmark



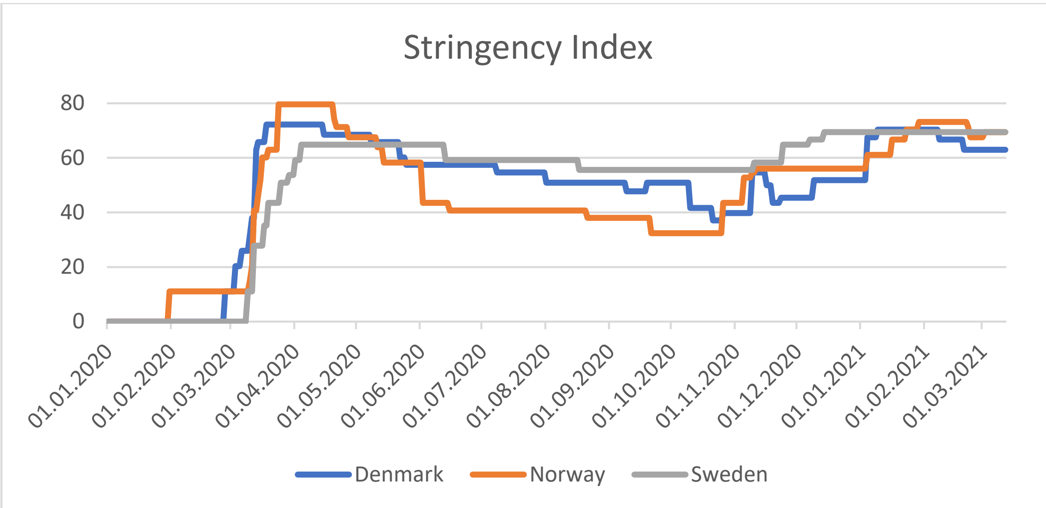
Notes: The figure above presents the movements of the three interest rate differentials for Denmark during the period 01.01.2020-12.03.2021.

Figure 14 Interest Rate Differential Sweden



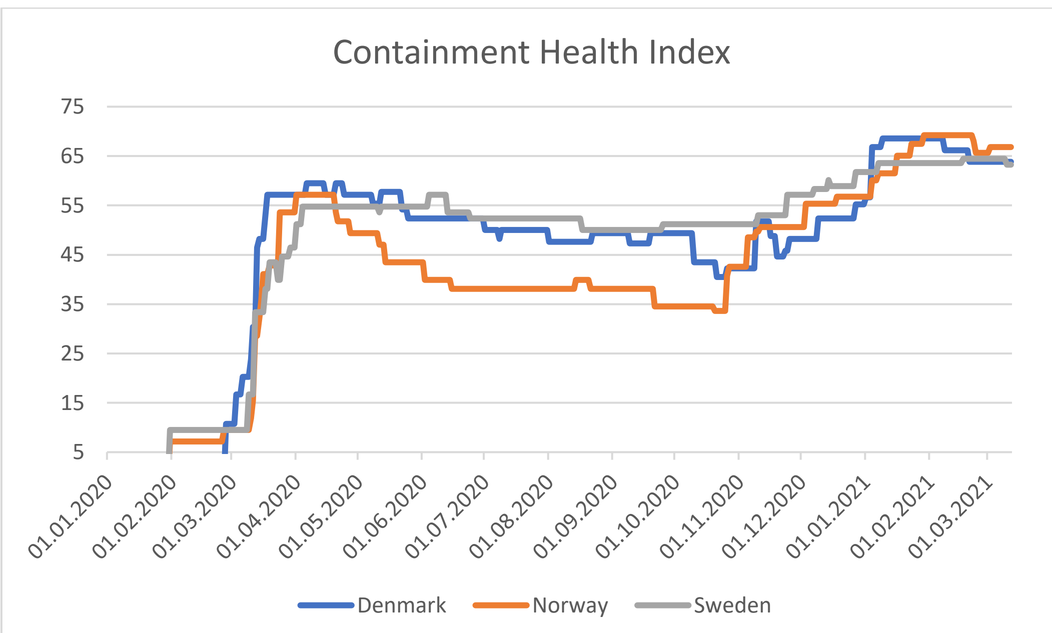
Notes: The figure above presents the movements of the three interest rate differentials for Sweden during the period 01.01.2020-12.03.2021.

Figure 15 Stringency Index (SI)



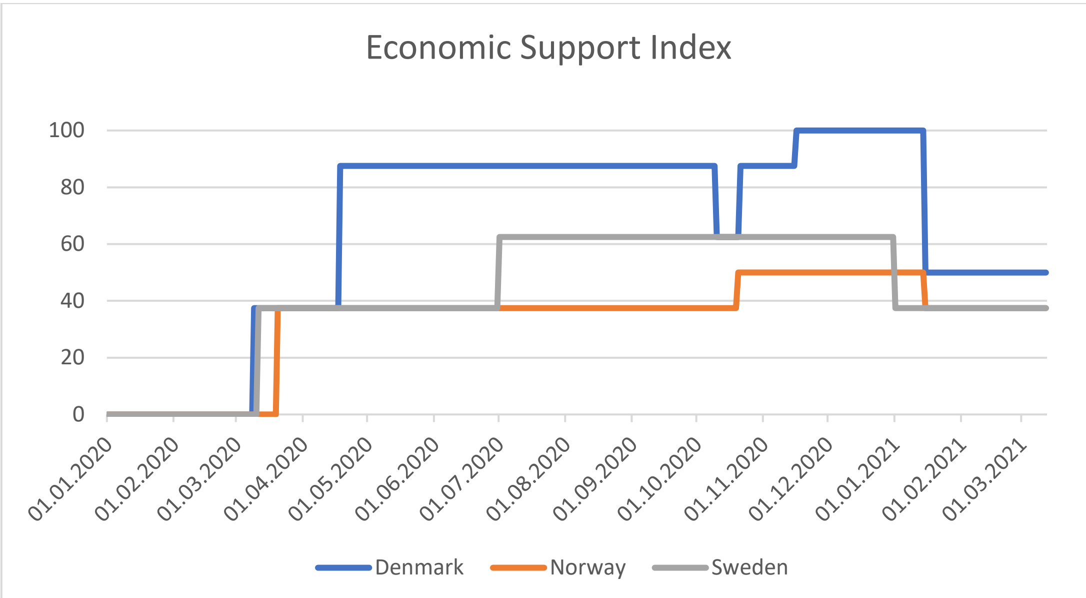
Notes: The figure above presents the movements of the Stringency Index values for Denmark, Norway, and Sweden during the period 01.01.2020-12.03.2021.

Figure 16 Containment Health Index (CHI)



Notes: The figure above presents the movements of the Containment Health values for Denmark, Norway, and Sweden during the period 01.01.2020-12.03.2021.

Figure 17 Economic Support Index (ESI)



Notes: The figure above presents the movements of the Economic support Index values for Denmark, Norway, and Sweden during the period 01.01.2020-12.03.2021.

Appendix: B- EER-42 composition

Trade weights of the EER-42 for each trading partner's currency and the euro in the period 2016-2018
(percentages; reporting countries in the columns, partner countries in the rows)

	AU	CA	DK	HK	JP	NO	SG	KR	SE	CH	GB	US	BG	CZ	HU	PL	RO	CN	DZ	AR	BR	CL
AU		0.51	0.71	0.82	1.13	0.49	2.57	0.94	0.53	0.50	1.12	1.06	0.14	0.16	0.21	0.17	0.15	1.43	0.05	0.36	0.36	0.62
CA	1.27		0.73	0.73	1.25	0.94	0.69	0.93	0.82	1.03	1.30	9.89	0.42	0.35	0.40	0.47	0.55	1.58	0.39	0.80	1.32	1.16
DK	0.64	0.29		0.44	0.39	6.53	0.68	0.37	5.82	0.71	1.32	0.54	0.82	0.87	0.96	1.40	0.69	0.48	0.59	0.57	0.68	0.66
HK	2.33	0.96	1.59		2.81	0.51	5.42	3.29	0.95	1.39	1.49	1.53	0.99	1.12	0.98	0.72	0.69	8.22	0.45	0.92	1.50	1.43
JP	6.07	2.95	2.02	5.44		2.06	8.73	9.76	1.93	3.02	3.14	7.05	1.06	1.59	2.00	1.32	1.10	10.15	0.80	1.76	2.76	4.07
NO	0.28	0.22	3.94	0.08	0.22		0.46	0.46	6.18	0.28	0.76	0.31	0.32	0.33	0.30	0.80	0.35	0.25	0.58	0.24	0.76	0.26
SG	5.53	0.61	1.73	6.04	3.83	1.70		3.01	0.53	1.48	1.16	1.82	0.52	0.55	0.55	0.50	0.41	3.72	0.32	0.51	0.92	0.62
KR	3.51	1.58	1.44	5.23	5.78	3.48	4.50		1.23	1.18	1.33	3.58	0.91	1.65	1.59	1.41	0.97	8.42	2.96	1.26	3.24	3.71
SE	0.80	0.47	8.56	0.33	0.51	14.99	0.36	0.49		1.19	1.66	0.72	1.08	1.46	1.39	2.39	1.08	0.67	0.63	0.73	0.71	0.73
CH	1.24	1.05	1.70	1.21	1.48	1.19	1.67	0.92	1.98		2.62	2.40	1.82	2.13	1.86	2.24	1.90	1.31	1.27	1.16	1.51	0.93
GB	5.28	2.69	7.15	2.47	3.00	6.74	2.84	1.88	6.66	5.96		5.23	4.74	4.52	4.25	5.24	4.72	2.59	2.06	1.61	2.37	1.69
US	15.37	55.48	8.10	7.31	18.61	7.82	13.18	14.26	7.71	15.18	15.41		4.20	4.72	5.39	4.87	4.37	16.85	4.70	20.13	23.88	18.23
BG	0.03	0.03	0.19	0.05	0.04	0.12	0.04	0.05	0.17	0.15	0.19	0.06		0.46	0.61	0.38	1.82	0.09	0.15	0.04	0.04	0.03
CZ	0.22	0.17	1.30	0.27	0.33	0.89	0.24	0.40	1.54	1.20	1.20	0.39	2.76		3.83	3.88	2.73	0.63	0.59	0.23	0.35	0.22
HU	0.19	0.14	0.86	0.18	0.27	0.46	0.17	0.28	0.96	0.66	0.72	0.31	3.04	2.42		1.94	4.43	0.39	0.25	0.27	0.26	0.17
PL	0.32	0.36	2.80	0.29	0.38	2.63	0.32	0.48	3.30	1.69	1.89	0.56	3.47	6.43	4.60		3.95	0.77	0.61	0.31	0.44	0.30
RO	0.08	0.13	0.46	0.10	0.12	0.43	0.10	0.15	0.51	0.48	0.57	0.18	4.93	1.36	3.03	1.25		0.25	1.09	0.11	0.16	0.11
CN	19.96	10.28	7.56	40.99	26.01	6.50	19.31	30.05	7.23	6.83	7.97	17.83	6.36	8.66	7.85	8.16	6.42		19.22	12.63	14.29	25.06
DZ	0.01	0.02	0.08	0.01	0.02	0.13	0.01	0.07	0.05	0.06	0.05	0.04	0.07	0.05	0.03	0.04	0.16	0.13		0.07	0.04	0.01
AR	0.13	0.10	0.20	0.09	0.11	0.12	0.07	0.10	0.17	0.15	0.10	0.46	0.08	0.07	0.10	0.06	0.06	0.28	0.14		7.52	4.26
BR	0.33	0.50	0.72	0.40	0.52	1.17	0.48	0.80	0.49	0.59	0.46	1.65	0.20	0.26	0.34	0.27	0.25	0.94	0.30	22.96		6.14
CL	0.18	0.17	0.22	0.12	0.24	0.12	0.08	0.39	0.14	0.12	0.10	0.39	0.04	0.05	0.06	0.05	0.05	0.58	0.02	3.72	1.83	
HR	0.05	0.04	0.17	0.05	0.03	0.17	0.04	0.05	0.17	0.16	0.13	0.05	0.36	0.30	0.56	0.26	0.25	0.06	0.08	0.05	0.04	0.02
IS	0.03	0.05	0.28	0.01	0.02	0.30	0.01	0.01	0.11	0.04	0.11	0.07	0.03	0.04	0.06	0.05	0.03	0.02	0.00	0.01	0.01	0.01
IN	2.78	1.37	2.12	2.86	1.75	1.72	4.05	2.36	1.41	1.19	2.08	3.01	0.97	0.81	1.01	1.00	0.80	2.89	2.19	1.36	2.06	1.19
ID	2.07	0.29	0.32	0.56	1.90	0.29	2.80	1.56	0.27	0.36	0.30	0.59	0.20	0.20	0.20	0.21	0.16	1.30	0.15	0.36	0.53	0.31
IL	0.33	0.38	0.40	0.51	0.34	0.34	0.34	0.30	0.31	0.55	0.57	0.99	0.57	0.39	0.48	0.34	0.46	0.47	0.44	0.29	0.53	0.21
MY	2.10	0.48	0.46	1.74	1.84	0.54	4.72	1.47	0.37	0.44	0.64	1.17	0.34	0.44	0.47	0.34	0.27	2.13	0.21	0.35	0.63	0.42
MX	0.60	4.58	0.61	0.41	1.35	0.44	0.49	1.21	0.46	0.75	0.59	10.41	0.25	0.45	0.55	0.35	0.36	1.78	0.19	2.41	2.55	2.95
MA	0.05	0.06	0.21	0.06	0.07	0.15	0.10	0.07	0.15	0.17	0.23	0.12	0.28	0.21	0.19	0.18	0.39	0.13	0.51	0.19	0.33	0.07
NZ	3.60	0.11	0.28	0.09	0.25	0.10	0.29	0.15	0.08	0.10	0.18	0.20	0.03	0.04	0.03	0.04	0.02	0.24	0.01	0.11	0.09	0.15
PH	0.62	0.27	0.25	1.02	1.46	0.22	1.43	1.66	0.16	0.18	0.22	0.63	0.21	0.15	0.22	0.14	0.09	1.10	0.09	0.19	0.19	0.15
RU	0.21	0.32	1.02	0.85	0.83	1.09	0.54	0.97	1.04	1.35	0.89	0.65	3.02	1.71	1.25	1.88	1.16	1.52	3.03	0.37	1.06	0.21
ZA	0.52	0.17	0.55	0.47	0.46	0.18	0.30	0.32	0.27	0.35	0.64	0.37	0.19	0.28	0.22	0.23	0.21	0.60	0.08	0.41	0.45	0.25
TW	1.52	0.88	0.60	4.59	4.07	0.56	4.25	3.42	0.60	0.68	0.76	1.89	0.53	0.58	0.69	0.53	0.43	5.75	0.32	0.55	0.92	1.12
TH	4.16	0.52	0.83	1.86	3.49	0.81	2.38	1.70	0.68	0.58	0.71	1.18	0.36	0.53	0.57	0.41	0.34	2.20	0.29	1.54	0.96	1.10
TR	0.36	0.33	1.39	0.67	0.45	1.43	0.46	0.84	1.08	0.76	1.40	0.57	6.50	1.42	1.57	1.56	3.24	0.84	4.63	0.39	0.60	0.62
PE	0.08	0.08	0.08	0.05	0.08	0.06	0.03	0.09	0.07	0.04	0.10	0.23	0.03	0.02	0.03	0.03	0.02	0.22	0.01	0.64	0.81	2.40
CO	0.11	0.09	0.10	0.12	0.09	0.06	0.05	0.10	0.05	0.09	0.07	0.40	0.02	0.02	0.04	0.02	0.07	0.21	0.01	0.62	0.94	1.02
SA	0.34	0.23	0.38	0.36	0.53	0.36	0.70	1.31	0.36	0.34	0.78	0.54	0.17	0.20	0.14	0.22	0.16	0.80	1.50	0.25	0.38	0.10
AE	1.34	0.27	0.77	1.88	0.91	0.48	1.17	1.36	0.32	1.55	1.01	0.81	0.45	0.36	0.27	0.29	0.34	1.24	1.22	0.26	0.44	0.31
UA	0.03	0.05	0.27	0.10	0.07	0.10	0.07	0.08	0.16	0.14	0.11	0.10	1.33	0.46	0.97	1.38	0.60	0.16	0.77	0.05	0.07	0.03
euro area	15.33	10.68	36.86	9.15	12.98	31.61	13.88	11.89	42.95	46.32	43.91	20.03	46.17	52.20	50.16	52.97	53.76	16.64	47.07	19.23	21.48	16.96
SUM	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

	HR	IS	IN	ID	IL	MY	MX	MA	NZ	PH	RU	ZA	TW	TH	TR	PE	CO	SA	AE	UA	euro area
AU	0.34	0.57	1.10	2.57	0.49	1.69	0.20	0.19	19.14	0.97	0.17	1.15	0.79	2.36	0.31	0.56	0.63	0.61	1.45	0.14	0.80
CA	0.58	2.49	1.37	0.79	1.42	0.82	3.71	0.59	1.32	0.90	0.62	0.94	0.85	0.77	0.64	1.30	1.20	1.02	0.75	0.48	1.39
DK	1.02	5.55	0.70	0.33	0.56	0.31	0.24	0.76	1.19	0.33	0.69	1.20	0.24	0.43	0.97	0.41	0.46	0.57	0.70	1.01	1.86
HK	1.18	0.56	4.32	2.39	2.56	2.87	0.71	0.97	1.44	3.36	2.36	3.24	3.63	3.20	2.17	1.17	2.00	1.88	5.00	1.53	1.79
JP	0.97	1.60	4.05	11.52	3.49	8.40	3.49	1.60	6.29	11.64	3.50	4.51	12.97	13.80	2.37	2.74	2.62	4.41	5.01	1.71	3.85
NO	0.56	3.70	0.41	0.20	0.28	0.24	0.10	0.36	0.29	0.18	0.47	0.23	0.14	0.27	0.65	0.22	0.17	0.33	0.30	0.24	1.00
SG	0.63	0.57	3.94	8.01	1.44	7.57	0.47	0.81	3.44	4.66	1.09	1.53	3.72	4.09	1.01	0.46	0.62	1.36	2.54	0.64	1.72
KR	1.43	0.78	4.10	6.41	2.10	4.57	2.53	1.39	2.58	9.24	3.02	2.28	5.95	4.32	3.30	2.44	1.96	7.13	4.57	1.24	2.36
SE	1.34	3.31	0.73	0.44	0.73	0.39	0.28	0.95	0.55	0.34	1.10	0.95	0.36	0.57	1.15	0.69	0.38	0.81	0.44	1.03	3.10
CH	2.12	1.68	1.11	0.82	2.34	0.89	0.76	1.51	1.15	0.66	2.21	1.70	0.87	0.93	1.62	0.66	1.13	1.41	2.67	1.40	5.82
GB	4.10	10.40	3.73	1.63	4.12	2.17	1.18	4.48	4.39	1.56	3.44	6.75	1.58	2.14	5.32	2.72	1.78	6.42	5.32	2.39	11.94
US	4.41	17.67	15.94	8.46	22.16	11.97	54.46	6.73	14.04	12.44	6.98	11.10	12.91	10.20	7.00	20.73	30.05	13.55	12.64	6.34	15.77
BG	0.52	0.14	0.08	0.05	0.18	0.05	0.02	0.20	0.03	0.06	0.43	0.09	0.04	0.05	0.95	0.05	0.03	0.06	0.07	0.82	0.53
CZ	2.47	1.14	0.43	0.26	1.07	0.33	0.25	1.26	0.26	0.25	1.69	0.79	0.29	0.32	1.63	0.18	0.14	0.45	0.43	2.64	3.62
HU	3.62	0.65	0.31	0.17	0.64	0.22	0.22	0.76	0.15	0.19	0.83	0.38	0.19	0.23	1.05	0.16	0.17	0.20	0.20	3.04	2.22
PL	3.12	1.84	0.61	0.33	0.93	0.37	0.25	1.36	0.37	0.28	2.47	0.89	0.32	0.41	2.16	0.29	0.22	0.56	0.44	10.41	5.13
RO	0.89	0.35	0.20	0.10	0.43	0.11	0.09	1.26	0.06	0.07	0.57	0.30	0.10	0.13	1.37	0.08	0.25	0.16	0.19	1.24	1.84
CN	5.41	4.22	18.76	22.18	12.41	24.00	12.22	9.09	16.36	23.14	17.74	18.33	32.51	21.43	11.61	20.26	16.01	16.18	15.18	11.74	13.88
DZ	0.07	0.01	0.10	0.02	0.07	0.02	0.01	0.24	0.01	0.02	0.22	0.02	0.01	0.02	0.37	0.01	0.01	0.18	0.09	0.26	0.30
AR	0.13	0.05	0.18	0.12	0.15	0.08	0.30	0.22	0.18	0.08	0.09	0.30	0.08	0.30	0.11	1.52	1.10	0.12	0.08	0.08	0.34
BR	0.27	0.22	0.80	0.58	0.78	0.41	1.10	1.09	0.38	0.26	0.68	1.14	0.38	0.60	0.60	5.72	5.15	0.52	0.42	0.28	1.16
CL	0.05	0.05	0.13	0.10	0.10	0.09	0.32	0.12	0.21	0.07	0.05	0.19	0.26	0.20	0.16	4.82	1.47	0.05	0.08	0.04	0.27
HR		0.14	0.09	0.04	0.11	0.03	0.01	0.10	0.05	0.03	0.15	0.08	0.03	0.05	0.16	0.03	0.03	0.07	0.07	0.17	0.51
IS	0.04		0.02	0.01	0.03	0.01	0.01	0.03	0.03	0.01	0.03	0.02	0.01	0.01	0.03	0.01	0.01	0.09	0.02	0.03	0.11
IN	1.46	0.90		2.89	4.21	2.63	1.05	2.81	2.57	1.91	2.63	3.64	1.44	3.37	2.57	2.18	2.16	4.03	8.18	1.79	2.84
ID	0.22	0.20	1.08		0.28	3.03	0.27	0.28	0.84	2.61	0.54	0.69	0.99	2.75	0.50	0.57	0.32	1.00	0.65	0.32	0.62
IL	0.48	0.39	1.08	0.21		0.29	0.25	0.43	0.31	0.34	0.80	0.38	0.37	0.47	1.00	0.31	0.31	0.17	0.14	0.54	0.91
MY	0.28	0.27	1.48	4.33	0.59		0.93	0.42	1.43	2.37	0.52	0.78	2.15	3.95	0.81	0.43	0.34	0.90	1.02	0.36	0.87
MX	0.23	0.37	0.94	0.65	1.12	1.15		0.44	0.50	0.74	0.46	0.68	0.86	1.00	0.51	3.70	5.97	0.36	0.41	0.30	1.32
MA	0.17	0.12	0.31	0.07	0.17	0.07	0.04		0.05	0.06	0.15	0.10	0.05	0.10	0.61	0.05	0.09	0.23	0.12	0.18	0.72
NZ	0.06	0.15	0.20	0.20	0.09	0.20	0.04	0.04		0.19	0.04	0.16	0.11	0.36	0.06	0.09	0.06	0.11	0.12	0.03	0.14
PH	0.14	0.16	0.49	1.47	0.35	1.19	0.30	0.18	0.59		0.22	0.23	1.27	1.85	0.17	0.17	0.13	0.20	0.26	0.15	0.42
RU	1.22	0.60	1.65	0.78	1.75	0.47	0.29	0.94	0.22	0.47		0.59	0.59	0.98	3.94	0.76	0.60	0.47	1.58	11.07	2.56
ZA	0.22	0.19	0.62	0.36	0.30	0.28	0.12	0.22	0.34	0.15	0.22		0.26	0.50	0.44	0.24	0.16	0.40	0.82	0.18	0.71
TW	0.40	0.44	1.43	2.36	1.33	4.67	1.03	0.51	1.27	4.51	0.82	1.13		2.97	0.90	0.91	0.80	1.23	0.90	0.55	1.22
TH	0.48	0.45	2.31	4.82	1.23	4.86	0.84	0.68	3.22	4.93	1.24	1.89	1.84		0.92	1.01	0.66	1.64	1.53	0.61	1.16
TR	1.39	0.96	1.07	0.53	2.81	0.55	0.24	3.86	0.36	0.29	3.10	1.02	0.38	0.59		0.50	0.57	2.05	1.48	3.59	2.59
PE	0.03	0.03	0.13	0.09	0.07	0.04	0.19	0.03	0.07	0.03	0.08	0.10	0.07	0.09	0.07		2.24	0.05	0.04	0.04	0.16
CO	0.04	0.02	0.17	0.06	0.09	0.04	0.42	0.07	0.06	0.04	0.08	0.07	0.06	0.08	0.09	3.01		0.04	0.06	0.08	0.18
SA	0.28	1.12	1.25	0.76	0.17	0.72	0.08	0.92	0.40	0.22	0.24	0.69	0.46	0.71	1.29	0.30	0.15		4.19	0.53	0.75
AE	0.48	0.30	3.64	0.74	0.29	0.75	0.17	0.78	0.60	0.40	1.23	1.76	0.48	1.01	1.36	0.29	0.34	7.30		0.79	1.10
UA	0.25	0.12	0.18	0.10	0.23	0.06	0.03	0.21	0.03	0.05	1.87	0.09	0.05	0.09	0.80	0.06	0.12	0.19	0.19		0.41
euro area	56.91	35.50	18.79	12.05	26.31	11.39	10.77	51.08	13.25	9.96	35.17	27.89	10.34	12.28	37.27	18.21	17.37	21.49	19.65	29.96	
SUM	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The effective exchange rate index (EER) is calculated using geometric weighted average of the country`s main export and import partner country of imported manufactured goods and services. Following formula is used in calculation of EER, and EER-42 index:

$$EER^t = \prod_{i=1}^{N} (e^t_{i,domestic\ currency})^{w_i},$$

N-is the number of international trade partners which is 42 for EER -42, *t*- stands for period, $\boldsymbol{w_i}$ trade weight of the trading partner currency, $\boldsymbol{e^t_{i,domestic\ currency}}$ is the index of the average exchange rate of the trading partner currency ***i*** against domestic currency in period ***t***. (ECB Statistics bulletin, 2020)

Appendix C – Stationarity

Simple linear regression model:

$$y_t = \varphi y_{t-1} + u_t ,$$

Where ***t*** denotes time period, $\boldsymbol{u_t}$-denotes error term and ***y*** at time ***t*** is a linear function of ***y*** at earlier times plus a constant term. The first difference is achieved through:

$$\Delta y_t = \beta y_{t-1} + u_t ,$$

Where Δy_t equals $y_t - y_{t-1}$, and β equals $\varphi - 1$.

H_0 hypothesis: β=0 – (φ =1) - meaning that the explanatory variable is nonstationary

H_1 hypothesis: β<0 – (φ <1) - meaning the explanatory variable is stationary. (Zaiontz, 2018)

Appendix D-Government response data

Index code	STR index	STR index	STR index	GRID	GRIN	GRIS	Cntainment H	Cntainment H	Cntainment H	Economic sup	Economic sup	Economic sup
country_name	Denmark	Norway	Sweden	Denmark	Norway	Sweden	Denmark	Norway	Sweden	Denmark	Norway	Sweden
12.mar.21	62.96	69.44	69.44	62.08	63.18	60.05	63.81	66.85	63.27	50	37.5	37.5
11.mar.21	62.96	69.44	69.44	62.08	63.18	60.05	63.81	66.85	63.27	50	37.5	37.5
10.mar.21	62.96	69.44	69.44	62.08	63.18	60.05	63.81	66.85	63.27	50	37.5	37.5
09.mar.21	62.96	69.44	69.44	62.08	63.18	61.09	63.81	66.85	64.46	50	37.5	37.5
08.mar.21	62.96	69.44	69.44	62.08	63.18	61.09	63.81	66.85	64.46	50	37.5	37.5
07.mar.21	62.96	69.44	69.44	62.08	63.18	61.09	63.81	66.85	64.46	50	37.5	37.5
06.mar.21	62.96	69.44	69.44	62.08	63.18	61.09	63.81	66.85	64.46	50	37.5	37.5
05.mar.21	62.96	69.44	69.44	62.08	63.18	61.09	63.81	66.85	64.46	50	37.5	37.5
04.mar.21	62.96	69.44	69.44	62.08	63.18	61.09	63.81	66.85	64.46	50	37.5	37.5
03.mar.21	62.96	69.44	69.44	62.08	63.18	61.09	63.81	66.85	64.46	50	37.5	37.5
02.mar.21	62.96	69.44	69.44	62.08	63.18	61.09	63.81	66.85	64.46	50	37.5	37.5
01.mar.21	62.96	67.59	69.44	62.08	62.14	61.09	63.81	65.65	64.46	50	37.5	37.5
28.feb.21	62.96	67.59	69.44	62.08	62.14	61.09	63.81	65.65	64.46	50	37.5	37.5
27.feb.21	62.96	67.59	69.44	62.08	62.14	61.09	63.81	65.65	64.46	50	37.5	37.5
26.feb.21	62.96	67.59	69.44	62.08	62.14	61.09	63.81	65.65	64.46	50	37.5	37.5
25.feb.21	62.96	67.59	69.44	62.08	62.14	61.09	63.81	65.65	64.46	50	37.5	37.5
24.feb.21	62.96	67.59	69.44	62.08	62.14	61.09	63.81	65.65	64.46	50	37.5	37.5
23.feb.21	62.96	67.59	69.44	62.08	62.14	61.09	63.81	65.65	64.46	50	37.5	37.5
22.feb.21	62.96	71.3	69.44	62.08	64.22	61.09	63.81	68.04	64.46	50	37.5	37.5
21.feb.21	62.96	73.15	69.44	62.08	65.26	61.09	63.81	69.23	64.46	50	37.5	37.5
20.feb.21	62.96	73.15	69.44	62.08	65.26	61.09	63.81	69.23	64.46	50	37.5	37.5
19.feb.21	66.67	73.15	69.44	64.17	65.26	61.09	66.19	69.23	64.46	50	37.5	37.5
18.feb.21	66.67	73.15	69.44	64.17	65.26	61.09	66.19	69.23	64.46	50	37.5	37.5
17.feb.21	66.67	73.15	69.44	64.17	65.26	61.09	66.19	69.23	64.46	50	37.5	37.5
16.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
15.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
14.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
13.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
12.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
11.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
10.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
09.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
08.feb.21	66.67	73.15	69.44	64.17	65.26	60.31	66.19	69.23	63.57	50	37.5	37.5
07.feb.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
06.feb.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
05.feb.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
04.feb.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
03.feb.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
02.feb.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
01.feb.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
31.jan.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
30.jan.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
29.jan.21	70.37	73.15	69.44	66.25	65.26	60.31	68.57	69.23	63.57	50	37.5	37.5
28.jan.21	70.37	70.37	69.44	66.25	63.7	60.31	68.57	67.44	63.57	50	37.5	37.5
27.jan.21	70.37	70.37	69.44	66.25	63.7	60.31	68.57	67.44	63.57	50	37.5	37.5
26.jan.21	70.37	70.37	69.44	66.25	63.7	60.31	68.57	67.44	63.57	50	37.5	37.5
25.jan.21	70.37	70.37	69.44	66.25	63.7	60.31	68.57	67.44	63.57	50	37.5	37.5
24.jan.21	70.37	70.37	69.44	66.25	63.7	60.31	68.57	67.44	63.57	50	37.5	37.5
23.jan.21	70.37	70.37	69.44	66.25	63.7	60.31	68.57	67.44	63.57	50	37.5	37.5
22.jan.21	70.37	66.67	69.44	66.25	61.61	60.31	68.57	65.06	63.57	50	37.5	37.5
21.jan.21	70.37	66.67	69.44	66.25	61.61	60.31	68.57	65.06	63.57	50	37.5	37.5
20.jan.21	70.37	66.67	69.44	66.25	61.61	60.31	68.57	65.06	63.57	50	37.5	37.5
19.jan.21	70.37	66.67	69.44	66.25	61.61	60.31	68.57	65.06	63.57	50	37.5	37.5
18.jan.21	70.37	66.67	69.44	66.25	61.61	60.31	68.57	65.06	63.57	50	37.5	37.5
17.jan.21	70.37	66.67	69.44	66.25	61.61	60.31	68.57	65.06	63.57	50	37.5	37.5
16.jan.21	70.37	66.67	69.44	66.25	61.61	60.31	68.57	65.06	63.57	50	37.5	37.5
15.jan.21	70.37	61.11	69.44	66.25	58.49	60.31	68.57	61.49	63.57	50	37.5	37.5
14.jan.21	70.37	61.11	69.44	72.5	60.05	60.31	68.57	61.49	63.57	100	50	37.5
13.jan.21	70.37	61.11	69.44	72.5	60.05	60.31	68.57	61.49	63.57	100	50	37.5
12.jan.21	70.37	61.11	69.44	72.5	60.05	60.31	68.57	61.49	63.57	100	50	37.5
11.jan.21	70.37	61.11	69.44	72.5	60.05	60.31	68.57	61.49	63.57	100	50	37.5
10.jan.21	70.37	61.11	69.44	72.5	60.05	60.31	68.57	61.49	63.57	100	50	37.5
09.jan.21	70.37	61.11	69.44	72.5	60.05	60.31	68.57	61.49	63.57	100	50	37.5
08.jan.21	67.59	61.11	69.44	70.94	60.05	60.31	66.79	61.49	63.57	100	50	37.5
07.jan.21	67.59	61.11	69.44	70.94	60.05	60.31	66.79	61.49	63.57	100	50	37.5
06.jan.21	67.59	61.11	69.44	70.94	58.8	58.75	66.79	60.06	61.79	100	50	37.5
05.jan.21	67.59	61.11	69.44	70.94	58.8	58.75	66.79	60.06	61.79	100	50	37.5
04.jan.21	67.59	61.11	69.44	70.94	58.8	58.75	66.79	60.06	61.79	100	50	37.5
03.jan.21	51.85	56.02	69.44	62.08	55.94	58.75	56.67	56.79	61.79	100	50	37.5
02.jan.21	51.85	56.02	69.44	62.08	55.94	58.75	56.67	56.79	61.79	100	50	37.5
01.jan.21	51.85	56.02	69.44	62.08	55.94	58.75	56.67	56.79	61.79	100	50	37.5
31.des.20	51.85	56.02	69.44	60.83	55.94	61.88	55.24	56.79	61.79	100	50	62.5
30.des.20	51.85	56.02	69.44	60.83	55.94	61.88	55.24	56.79	61.79	100	50	62.5
29.des.20	51.85	56.02	69.44	60.83	55.94	61.88	55.24	56.79	61.79	100	50	62.5
28.des.20	51.85	56.02	69.44	60.83	55.94	61.88	55.24	56.79	61.79	100	50	62.5
27.des.20	51.85	56.02	69.44	60.83	55.94	61.88	55.24	56.79	61.79	100	50	62.5
26.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5
25.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5
24.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5
23.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5
22.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5

21.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5
20.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5
19.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5
18.des.20	51.85	56.02	69.44	58.33	55.94	59.38	52.38	56.79	58.93	100	50	62.5
17.des.20	51.85	56.02	69.44	58.33	54.69	59.38	52.38	55.36	58.93	100	50	62.5
16.des.20	51.85	56.02	69.44	58.33	54.69	59.38	52.38	55.36	58.93	100	50	62.5
15.des.20	51.85	56.02	69.44	58.33	54.69	59.38	52.38	55.36	58.93	100	50	62.5
14.des.20	51.85	56.02	69.44	58.33	54.69	60.42	52.38	55.36	60.12	100	50	62.5
13.des.20	51.85	56.02	66.67	58.33	54.69	58.85	52.38	55.36	58.33	100	50	62.5
12.des.20	51.85	56.02	66.67	58.33	54.69	58.85	52.38	55.36	58.33	100	50	62.5
11.des.20	51.85	56.02	66.67	58.33	54.69	58.85	52.38	55.36	58.33	100	50	62.5
10.des.20	51.85	56.02	66.67	58.33	54.69	58.85	52.38	55.36	58.33	100	50	62.5
09.des.20	51.85	56.02	66.67	58.33	54.69	58.85	52.38	55.36	58.33	100	50	62.5
08.des.20	45.37	56.02	66.67	54.69	54.69	58.85	48.21	55.36	58.33	100	50	62.5
07.des.20	45.37	56.02	66.67	54.69	54.69	58.85	48.21	55.36	58.33	100	50	62.5
06.des.20	45.37	56.02	64.81	54.69	54.69	57.81	48.21	55.36	57.14	100	50	62.5
05.des.20	45.37	56.02	64.81	54.69	54.69	57.81	48.21	55.36	57.14	100	50	62.5
04.des.20	45.37	56.02	64.81	54.69	54.69	57.81	48.21	55.36	57.14	100	50	62.5
03.des.20	45.37	56.02	64.81	54.69	54.69	57.81	48.21	55.36	57.14	100	50	62.5
02.des.20	45.37	56.02	64.81	54.69	50.52	57.81	48.21	50.6	57.14	100	50	62.5
01.des.20	45.37	56.02	64.81	54.69	50.52	57.81	48.21	50.6	57.14	100	50	62.5
30.nov.20	45.37	56.02	64.81	54.69	50.52	57.81	48.21	50.6	57.14	100	50	62.5
29.nov.20	45.37	56.02	64.81	54.69	50.52	57.81	48.21	50.6	57.14	100	50	62.5
28.nov.20	45.37	56.02	64.81	54.69	50.52	57.81	48.21	50.6	57.14	100	50	62.5
27.nov.20	45.37	56.02	64.81	54.69	50.52	57.81	48.21	50.6	57.14	100	50	62.5
26.nov.20	45.37	56.02	64.81	54.69	50.52	57.81	48.21	50.6	57.14	100	50	62.5
25.nov.20	45.37	56.02	64.81	54.69	50.52	57.81	48.21	50.6	57.14	100	50	62.5
24.nov.20	45.37	56.02	64.81	52.6	50.52	57.81	45.83	50.6	57.14	100	50	62.5
23.nov.20	45.37	56.02	58.33	52.6	50.52	54.17	45.83	50.6	52.98	100	50	62.5
22.nov.20	43.52	56.02	58.33	51.56	50.52	54.17	44.64	50.6	52.98	100	50	62.5
21.nov.20	43.52	56.02	58.33	51.56	50.52	54.17	44.64	50.6	52.98	100	50	62.5
20.nov.20	43.52	56.02	58.33	51.56	50.52	54.17	44.64	50.6	52.98	100	50	62.5
19.nov.20	43.52	56.02	58.33	51.56	50.52	54.17	44.64	50.6	52.98	100	50	62.5
18.nov.20	50	56.02	58.33	55.21	50.52	54.17	48.81	50.6	52.98	100	50	62.5
17.nov.20	50	56.02	58.33	55.21	50.52	54.17	48.81	50.6	52.98	100	50	62.5
16.nov.20	50	56.02	58.33	55.21	50.52	54.17	48.81	50.6	52.98	100	50	62.5
15.nov.20	54.63	56.02	58.33	56.25	50.52	54.17	51.79	50.6	52.98	87.5	50	62.5
14.nov.20	54.63	56.02	58.33	56.25	50.52	54.17	51.79	50.6	52.98	87.5	50	62.5
13.nov.20	54.63	56.02	58.33	56.25	50.52	54.17	51.79	50.6	52.98	87.5	50	62.5
12.nov.20	54.63	56.02	58.33	56.25	50.52	54.17	51.79	50.6	52.98	87.5	50	62.5
11.nov.20	54.63	56.02	58.33	56.25	50.52	54.17	51.79	50.6	52.98	87.5	50	62.5
10.nov.20	54.63	54.63	58.33	56.25	49.74	54.17	51.79	49.7	52.98	87.5	50	62.5
09.nov.20	54.63	54.63	55.56	56.25	49.74	52.6	51.79	49.7	51.19	87.5	50	62.5
08.nov.20	39.81	52.78	55.56	47.92	48.7	52.6	42.26	48.51	51.19	87.5	50	62.5
07.nov.20	39.81	52.78	55.56	47.92	48.7	52.6	42.26	48.51	51.19	87.5	50	62.5
06.nov.20	39.81	52.78	55.56	47.92	48.7	52.6	42.26	48.51	51.19	87.5	50	62.5
05.nov.20	39.81	52.78	55.56	47.92	48.7	52.6	42.26	48.51	51.19	87.5	50	62.5
04.nov.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
03.nov.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
02.nov.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
01.nov.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
31.okt.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
30.okt.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
29.okt.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
28.okt.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
27.okt.20	39.81	43.52	55.56	47.92	43.49	52.6	42.26	42.56	51.19	87.5	50	62.5
26.okt.20	39.81	43.52	55.56	47.92	41.93	52.6	42.26	40.77	51.19	87.5	50	62.5
25.okt.20	37.04	32.41	55.56	46.35	35.68	52.6	40.48	33.63	51.19	87.5	50	62.5
24.okt.20	37.04	32.41	55.56	46.35	35.68	52.6	40.48	33.63	51.19	87.5	50	62.5
23.okt.20	37.04	32.41	55.56	46.35	35.68	52.6	40.48	33.63	51.19	87.5	50	62.5
22.okt.20	37.04	32.41	55.56	46.35	35.68	52.6	40.48	33.63	51.19	87.5	50	62.5
21.okt.20	37.04	32.41	55.56	46.35	35.68	52.6	40.48	33.63	51.19	87.5	50	62.5
20.okt.20	41.67	32.41	55.56	45.83	35.68	52.6	43.45	33.63	51.19	62.5	50	62.5
19.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
18.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
17.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
16.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
15.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
14.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
13.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
12.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
11.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
10.okt.20	41.67	32.41	55.56	45.83	34.9	52.6	43.45	34.52	51.19	62.5	37.5	62.5
09.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
08.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
07.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
06.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
05.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
04.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
03.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
02.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
01.okt.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
30.sep.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
29.sep.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
28.sep.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
27.sep.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
26.sep.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5

25.sep.20	50.93	32.41	55.56	54.17	34.9	52.6	49.4	34.52	51.19	87.5	37.5	62.5
24.sep.20	50.93	32.41	55.56	54.17	34.9	51.56	49.4	34.52	50	87.5	37.5	62.5
23.sep.20	50.93	32.41	55.56	54.17	34.9	51.56	49.4	34.52	50	87.5	37.5	62.5
22.sep.20	50.93	32.41	55.56	54.17	34.9	51.56	49.4	34.52	50	87.5	37.5	62.5
21.sep.20	50.93	32.41	55.56	54.17	34.9	51.56	49.4	34.52	50	87.5	37.5	62.5
20.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
19.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
18.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
17.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
16.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
15.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
14.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
13.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
12.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
11.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
10.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
09.sep.20	47.69	37.96	55.56	52.34	38.02	51.56	47.32	38.1	50	87.5	37.5	62.5
08.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
07.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
06.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
05.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
04.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
03.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
02.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
01.sep.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
31.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
30.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
29.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
28.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
27.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
26.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
25.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
24.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
23.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
22.aug.20	50.93	37.96	55.56	54.17	38.02	51.56	49.4	38.1	50	87.5	37.5	62.5
21.aug.20	50.93	37.96	55.56	52.6	38.02	51.56	47.62	38.1	50	87.5	37.5	62.5
20.aug.20	50.93	40.74	55.56	52.6	39.58	51.56	47.62	39.88	50	87.5	37.5	62.5
19.aug.20	50.93	40.74	55.56	52.6	39.58	51.56	47.62	39.88	50	87.5	37.5	62.5
18.aug.20	50.93	40.74	55.56	52.6	39.58	51.56	47.62	39.88	50	87.5	37.5	62.5
17.aug.20	50.93	40.74	55.56	52.6	39.58	51.56	47.62	39.88	50	87.5	37.5	62.5
16.aug.20	50.93	40.74	59.26	52.6	39.58	53.65	47.62	39.88	52.38	87.5	37.5	62.5
15.aug.20	50.93	40.74	59.26	52.6	39.58	53.65	47.62	39.88	52.38	87.5	37.5	62.5
14.aug.20	50.93	40.74	59.26	52.6	39.58	53.65	47.62	39.88	52.38	87.5	37.5	62.5
13.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
12.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
11.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
10.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
09.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
08.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
07.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
06.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
05.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
04.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
03.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
02.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
01.aug.20	50.93	40.74	59.26	52.6	38.02	53.65	47.62	38.1	52.38	87.5	37.5	62.5
31.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
30.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
29.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
28.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
27.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
26.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
25.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
24.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
23.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
22.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
21.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
20.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
19.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
18.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
17.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
16.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
15.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
14.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
13.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
12.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
11.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
10.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
09.jul.20	54.63	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
08.jul.20	54.63	40.74	59.26	53.12	38.02	53.65	48.21	38.1	52.38	87.5	37.5	62.5
07.jul.20	57.41	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
06.jul.20	57.41	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
05.jul.20	57.41	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
04.jul.20	57.41	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
03.jul.20	57.41	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
02.jul.20	57.41	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5
01.jul.20	57.41	40.74	59.26	54.69	38.02	53.65	50	38.1	52.38	87.5	37.5	62.5

30.jun.20	57.41	40.74	59.26	56.77	38.02	50.52	52.38	38.1	52.38	87.5	37.5	37.5
29.jun.20	57.41	40.74	59.26	56.77	38.02	50.52	52.38	38.1	52.38	87.5	37.5	37.5
28.jun.20	57.41	40.74	59.26	56.77	38.02	50.52	52.38	38.1	52.38	87.5	37.5	37.5
27.jun.20	57.41	40.74	59.26	56.77	38.02	50.52	52.38	38.1	52.38	87.5	37.5	37.5
26.jun.20	57.41	40.74	59.26	56.77	38.02	50.52	52.38	38.1	52.38	87.5	37.5	37.5
25.jun.20	57.41	40.74	59.26	56.77	38.02	50.52	52.38	38.1	52.38	87.5	37.5	37.5
24.jun.20	57.41	40.74	59.26	56.77	38.02	50.52	52.38	38.1	52.38	87.5	37.5	37.5
23.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
22.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
21.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
20.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
19.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
18.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
17.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
16.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
15.jun.20	57.41	40.74	59.26	56.77	38.02	51.56	52.38	38.1	53.57	87.5	37.5	37.5
14.jun.20	57.41	43.52	59.26	56.77	39.58	51.56	52.38	39.88	53.57	87.5	37.5	37.5
13.jun.20	57.41	43.52	59.26	56.77	39.58	51.56	52.38	39.88	53.57	87.5	37.5	37.5
12.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
11.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
10.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
09.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
08.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
07.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
06.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
05.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
04.jun.20	57.41	43.52	64.81	56.77	39.58	54.69	52.38	39.88	57.14	87.5	37.5	37.5
03.jun.20	57.41	43.52	64.81	56.77	39.58	52.6	52.38	39.88	54.76	87.5	37.5	37.5
02.jun.20	57.41	43.52	64.81	56.77	39.58	52.6	52.38	39.88	54.76	87.5	37.5	37.5
01.jun.20	57.41	58.33	64.81	56.77	42.71	52.6	52.38	43.45	54.76	87.5	37.5	37.5
31.mai.20	57.41	58.33	64.81	56.77	42.71	52.6	52.38	43.45	54.76	87.5	37.5	37.5
30.mai.20	57.41	58.33	64.81	56.77	42.71	52.6	52.38	43.45	54.76	87.5	37.5	37.5
29.mai.20	57.41	58.33	64.81	56.77	42.71	52.6	52.38	43.45	54.76	87.5	37.5	37.5
28.mai.20	57.41	58.33	64.81	56.77	42.71	52.6	52.38	43.45	54.76	87.5	37.5	37.5
27.mai.20	57.41	58.33	64.81	56.77	42.71	52.6	52.38	43.45	54.76	87.5	37.5	37.5
26.mai.20	57.41	58.33	64.81	56.77	42.71	52.6	52.38	43.45	54.76	87.5	37.5	37.5
25.mai.20	57.41	58.33	64.81	56.77	42.71	52.6	52.38	43.45	54.76	87.5	37.5	37.5
24.mai.20	60.19	58.33	64.81	58.33	42.71	52.6	54.17	43.45	54.76	87.5	37.5	37.5
23.mai.20	60.19	58.33	64.81	58.33	42.71	52.6	54.17	43.45	54.76	87.5	37.5	37.5
22.mai.20	60.19	58.33	64.81	58.33	42.71	52.6	54.17	43.45	54.76	87.5	37.5	37.5
21.mai.20	65.74	58.33	64.81	61.46	42.71	52.6	57.74	43.45	54.76	87.5	37.5	37.5
20.mai.20	65.74	58.33	64.81	61.46	42.71	52.6	57.74	43.45	54.76	87.5	37.5	37.5
19.mai.20	65.74	58.33	64.81	61.46	42.71	52.6	57.74	43.45	54.76	87.5	37.5	37.5
18.mai.20	65.74	58.33	64.81	61.46	42.71	52.6	57.74	43.45	54.76	87.5	37.5	37.5
17.mai.20	65.74	58.33	64.81	61.46	42.71	52.6	57.74	43.45	54.76	87.5	37.5	37.5
16.mai.20	65.74	58.33	64.81	61.46	42.71	52.6	57.74	43.45	54.76	87.5	37.5	37.5
15.mai.20	65.74	58.33	64.81	61.46	42.71	52.6	57.74	43.45	54.76	87.5	37.5	37.5
14.mai.20	65.74	58.33	64.81	61.46	42.71	52.6	57.74	43.45	54.76	87.5	37.5	37.5
13.mai.20	65.74	63.89	64.81	61.46	45.83	52.6	57.74	47.02	54.76	87.5	37.5	37.5
12.mai.20	65.74	63.89	64.81	61.46	45.83	52.6	57.74	47.02	54.76	87.5	37.5	37.5
11.mai.20	65.74	63.89	64.81	59.38	45.83	51.56	55.36	47.02	53.57	87.5	37.5	37.5
10.mai.20	65.74	67.59	64.81	59.38	47.92	52.6	55.36	49.4	54.76	87.5	37.5	37.5
09.mai.20	65.74	67.59	64.81	59.38	47.92	52.6	55.36	49.4	54.76	87.5	37.5	37.5
08.mai.20	65.74	67.59	64.81	59.38	47.92	52.6	55.36	49.4	54.76	87.5	37.5	37.5
07.mai.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
06.mai.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
05.mai.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
04.mai.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
03.mai.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
02.mai.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
01.mai.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
30.apr.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
29.apr.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
28.apr.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
27.apr.20	68.52	67.59	64.81	60.94	47.92	52.6	57.14	49.4	54.76	87.5	37.5	37.5
26.apr.20	68.52	71.3	64.81	60.94	50	52.6	57.14	51.79	54.76	87.5	37.5	37.5
25.apr.20	68.52	71.3	64.81	60.94	50	52.6	57.14	51.79	54.76	87.5	37.5	37.5
24.apr.20	68.52	71.3	64.81	60.94	50	52.6	57.14	51.79	54.76	87.5	37.5	37.5
23.apr.20	68.52	71.3	64.81	63.02	50	52.6	59.52	51.79	54.76	87.5	37.5	37.5
22.apr.20	68.52	71.3	64.81	63.02	50	52.6	59.52	51.79	54.76	87.5	37.5	37.5
21.apr.20	68.52	71.3	64.81	63.02	50	52.6	59.52	51.79	54.76	87.5	37.5	37.5
20.apr.20	68.52	74.07	64.81	63.02	51.56	52.6	59.52	53.57	54.76	87.5	37.5	37.5
19.apr.20	68.52	79.63	64.81	60.94	54.69	52.6	57.14	57.14	54.76	87.5	37.5	37.5
18.apr.20	68.52	79.63	64.81	60.94	54.69	52.6	57.14	57.14	54.76	87.5	37.5	37.5
17.apr.20	68.52	79.63	64.81	54.69	54.69	52.6	57.14	57.14	54.76	37.5	37.5	37.5
16.apr.20	68.52	79.63	64.81	54.69	54.69	52.6	57.14	57.14	54.76	37.5	37.5	37.5
15.apr.20	68.52	79.63	64.81	54.69	54.69	52.6	57.14	57.14	54.76	37.5	37.5	37.5
14.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
13.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
12.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
11.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
10.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
09.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
08.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
07.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
06.apr.20	72.22	79.63	64.81	56.77	54.69	52.6	59.52	57.14	54.76	37.5	37.5	37.5
05.apr.20	72.22	79.63	64.81	54.69	54.69	52.6	57.14	57.14	54.76	37.5	37.5	37.5

04.apr.20	72.22	79.63	64.81	54.69	54.69	52.6	57.14	57.14	54.76	37.5	37.5	37.5
03.apr.20	72.22	79.63	59.26	54.69	54.69	49.48	57.14	57.14	51.19	37.5	37.5	37.5
02.apr.20	72.22	79.63	59.26	54.69	54.69	49.48	57.14	57.14	51.19	37.5	37.5	37.5
01.apr.20	72.22	79.63	59.26	54.69	54.69	49.48	57.14	57.14	51.19	37.5	37.5	37.5
31.mar.20	72.22	79.63	53.7	54.69	51.56	45.31	57.14	53.57	46.43	37.5	37.5	37.5
30.mar.20	72.22	79.63	53.7	54.69	51.56	45.31	57.14	53.57	46.43	37.5	37.5	37.5
29.mar.20	72.22	79.63	53.7	54.69	51.56	45.31	57.14	53.57	46.43	37.5	37.5	37.5
28.mar.20	72.22	79.63	50.93	54.69	51.56	43.75	57.14	53.57	44.64	37.5	37.5	37.5
27.mar.20	72.22	79.63	50.93	54.69	51.56	43.75	57.14	53.57	44.64	37.5	37.5	37.5
26.mar.20	72.22	79.63	50.93	54.69	51.56	43.75	57.14	53.57	44.64	37.5	37.5	37.5
25.mar.20	72.22	79.63	50.93	54.69	51.56	43.75	57.14	53.57	44.64	37.5	37.5	37.5
24.mar.20	72.22	79.63	43.52	54.69	51.56	39.58	57.14	53.57	39.88	37.5	37.5	37.5
23.mar.20	72.22	62.96	43.52	54.69	42.19	39.58	57.14	42.86	39.88	37.5	37.5	37.5
22.mar.20	72.22	62.96	43.52	54.69	42.19	42.71	57.14	42.86	43.45	37.5	37.5	37.5
21.mar.20	72.22	62.96	43.52	54.69	42.19	42.71	57.14	42.86	43.45	37.5	37.5	37.5
20.mar.20	72.22	62.96	43.52	54.69	42.19	42.71	57.14	42.86	43.45	37.5	37.5	37.5
19.mar.20	72.22	62.96	43.52	54.69	37.5	42.71	57.14	42.86	43.45	37.5	0	37.5
18.mar.20	72.22	60.19	35.19	54.69	35.94	38.02	57.14	41.07	38.1	37.5	0	37.5
17.mar.20	65.74	60.19	35.19	51.04	35.94	38.02	52.98	41.07	38.1	37.5	0	37.5
16.mar.20	65.74	60.19	27.78	46.87	35.94	33.85	48.21	41.07	33.33	37.5	0	37.5
15.mar.20	65.74	51.85	27.78	46.87	31.25	33.85	48.21	35.71	33.33	37.5	0	37.5
14.mar.20	65.74	46.3	27.78	46.87	28.12	33.85	48.21	32.14	33.33	37.5	0	37.5
13.mar.20	62.96	40.74	27.78	45.31	25	33.85	46.43	28.57	33.33	37.5	0	37.5
12.mar.20	37.96	40.74	27.78	31.25	25	33.85	30.36	28.57	33.33	37.5	0	37.5
11.mar.20	37.96	20.37	11.11	31.25	13.54	19.27	30.36	15.48	16.67	37.5	0	37.5
10.mar.20	31.48	14.81	11.11	25.52	10.42	14.58	23.81	11.9	16.67	37.5	0	0
09.mar.20	25.93	11.11	11.11	22.4	8.33	14.58	20.24	9.52	16.67	37.5	0	0
08.mar.20	25.93	11.11	0	17.71	8.33	8.33	20.24	9.52	9.52	0	0	0
07.mar.20	25.93	11.11	0	17.71	8.33	8.33	20.24	9.52	9.52	0	0	0
06.mar.20	25.93	11.11	0	17.71	8.33	8.33	20.24	9.52	9.52	0	0	0
05.mar.20	20.37	11.11	0	14.58	8.33	8.33	16.67	9.52	9.52	0	0	0
04.mar.20	20.37	11.11	0	14.58	8.33	8.33	16.67	9.52	9.52	0	0	0
03.mar.20	20.37	11.11	0	14.58	8.33	8.33	16.67	9.52	9.52	0	0	0
02.mar.20	11.11	11.11	0	9.38	8.33	8.33	10.71	9.52	9.52	0	0	0
01.mar.20	11.11	11.11	0	9.38	8.33	8.33	10.71	9.52	9.52	0	0	0
29.feb.20	11.11	11.11	0	9.38	8.33	8.33	10.71	9.52	9.52	0	0	0
28.feb.20	11.11	11.11	0	9.38	8.33	8.33	10.71	9.52	9.52	0	0	0
27.feb.20	11.11	11.11	0	9.38	8.33	8.33	10.71	9.52	9.52	0	0	0
26.feb.20	0	11.11	0	0	8.33	8.33	0	9.52	9.52	0	0	0
25.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
24.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
23.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
22.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
21.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
20.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
19.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
18.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
17.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
16.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
15.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
14.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
13.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
12.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
11.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
10.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
09.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
08.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
07.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
06.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
05.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
04.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
03.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
02.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
01.feb.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
31.jan.20	0	11.11	0	0	6.25	8.33	0	7.14	9.52	0	0	0
30.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
29.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
28.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
27.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
26.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
25.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
24.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
23.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
22.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
21.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
20.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
19.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
18.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
17.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
16.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
15.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
14.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
13.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
12.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
11.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
10.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
09.jan.20	0	0	0	0	0	0	0	0	0	0	0	0

08.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
07.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
06.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
05.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
04.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
03.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
02.jan.20	0	0	0	0	0	0	0	0	0	0	0	0
01.jan.20	0	0	0	0	0	0	0	0	0	0	0	0